2007 Annual Revision Cycle

National Electrical Code® Committee Report on Comments

NOTE: Notice of Intent to Make an NEC® Motion (NITMAM) deadline is May 4, 2007

A compilation of the documented action on comments received by the code-making panels for the 2007 Annual Revision Cycle

NOTE: The proposals contained in the NEC Report on Proposals (ROP) and the comments addressed in this Report on Comments (ROC) will be presented for action at the NFPA June 2007 Annual Association Technical Meeting to be held June 3–7 in Boston, MA, only when proper Amending Motions have been submitted to the NFPA by the deadline of May 4, 2007. For more information on the new rules and for up-to-date information on schedules and deadlines for processing NFPA Documents, check the NFPA website (www.nfpa.org) or contact NFPA Standards Administration.
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Technical Correlating Committee on National Electrical Code®

James W. Carpenter, Chair
International Association of Electrical Inspectors, TX [E]

Mark W. Earley, Nonvoting Secretary
National Fire Protection Association, MA

Jean A. O’Connor, Recording Secretary
National Fire Protection Association, MA

James E. Brunssen, Telcordia, NJ [UT]
Rep. Alliance for Telecommunications Industry Solutions

Merton W. Bunker, Jr., US Department of State, VA [U]

William R. Drake, Marinco, CA [M]

Palmer L. Hickman, National Joint Apprentice & Training Committee, MD [L]
Rep. International Brotherhood of Electrical Workers

John R. Kovacik, Underwriters Laboratories Inc., IL [RT]

William M. Lewis, Martinsville, IN [U]
Rep. American Chemistry Council

Jim Pauley, Square D Company/Schneider Electric, KY [M]
Rep. National Electrical Manufacturers Association

Michael D. Toman, MEGA Power Electrical Services, Inc., MD [IM]
Rep. National Electrical Contractors Association

John W. Troglia, Edison Electric Institute, WI [UT]
Rep. Electric Light & Power Group/EEI

Robert G. Wilkinson, IEC Texas Gulf Coast, TX [IM]

Alternates

Jeffrey Boksiner, Telcordia Technologies, Inc., NJ [UT]
(Alt. to James E. Brunssen)

James M. Daly, General Cable, NJ [M]
(Alt. to Jim Pauley)

Stanley J. Folz, Morse Electric Company, NV [IM]
(Alt. to Michael D. Toman)

David L. Hittinger, IEC of Greater Cincinnati, OH [IM]
(Alt. to Robert G. Wilkinson)

Neil E. LaBrake, Jr., National Grid, NY [UT]
(Alt. to John W. Troglia)

Danny Liggett, Dupont Company, TX [U]
(Alt. to William M. Lewis)

Mark C. Ode, Underwriters Laboratories Inc., NC [RT]
(Alt. to John R. Kovacik)

Richard P. Owen, City of St. Paul, MN [E]
(Alt. to James W. Carpenter)

Nonvoting

David Mascarenhas, Canadian Standards Association, Canada [RT]

Richard G. Biermann, Biermann Electric Company, Inc., IA [IM]
(Member Emeritus)

D. Harold Ware, Libra Electric Company, OK [IM]
(Member Emeritus)

Mark W. Earley, NFPA Staff Liaison
Code-Making Panel 1
Articles 90, 100, 110, Annex A, Annex G

John D Minick, Chair
National Electrical Manufacturers Association, TX [M]

Michael A Anthony, University of Michigan, MI [U]
   Rep. Association of Higher Education Facilities Officers
Louis A Barrios, Shell Global Solutions, TX [U]
   Rep. American Chemistry Council
Kenneth P Boyce, Underwriters Laboratories Inc., IL [RT]
William T Fiske, Intertek Testing Services NA, Inc., NY [RT]
H. Landis Floyd, The DuPont Company, DE [U]
   Rep. Institute of Electrical & Electronics Engineers, Inc.
Palmer L Hickman, National Joint Apprentice & Training Committee, MD [L]
   Rep. International Brotherhood of Electrical Workers

David L Hittinger, IEC of Greater Cincinnati, OH [IM]
Neil F LaBrake, Jr., National Grid, NY [UT]
   Rep. Electric Light & Power Group/EEI
Randall R McCarver, Telcordia Technologies, Inc., NJ [U]
   Rep. Alliance for Telecommunications Industry Solutions
Lanny G McMahl, City of Phoenix, AZ [E]
   Rep. International Association of Electrical Inspectors
H. Brooke Staufer, National Electrical Contractors Association, MD [IM]

Alternates
Mark Christian, IBEW Local Union 175, TN [L]
   (Alt. to Palmer L Hickman)
Benjamin F Dunford, Ben Dunford Electric Company Inc., TN [IM]
   (Alt. to David L Hittinger)
Ernest J Gallo, Telcordia Technologies, Inc., NJ [U]
   (Alt. to Randall R McCarver)
Russell J Helmick, Jr., Orange, CA [E]
   (Alt. to Lanny G McMahl)
Donald H McCullough, II, Washington Savannah River Company, SC [U]
   (Alt. to H. Landis Floyd)

Nonvoting
Ark Tsisserev, City of Vancouver, Canada
   Rep. CSA/Canadian Electrical Code Committee
Mark W Earley, NFPA Staff Liaison
Code-Making Panel 2
Articles 210, 215, 220, Annex D
Chapter 9 Examples 1 through 6

Raymond W Weber, Chair
State of Wisconsin, WI [E]
Rep. International Association of Electrical Inspectors

Richard W Becker, Engineered Electrical Systems, Inc., WA [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

Lawrence Brown, National Association of Home Builders, DC [U]

Frank Coluccio, New York City Department of Buildings, NY [E]

Thomas L Harman, University of Houston-Clear Lake, TX [SE]

Donald M King, IBEW Local Union 313, DE [L]
Rep. International Brotherhood of Electrical Workers

Robert L LaRocca, Underwriters Laboratories Inc., NY [RT]

Brian J Nenninger, The Dow Chemical Company, TX [U]
Rep. American Chemistry Council

Jim Pauley, Square D Company/Schneider Electric, KY [M]
Rep. National Electrical Manufacturers Association

Ronald L Purvis, Sharpsburg, GA [UT]
Rep. Electric Light & Power Group/EEI

Michael D Toman, MEGA Power Electrical Services, Inc., MD [IM]
Rep. National Electrical Contractors Association

Robert G Wilkinson, IEC Texas Gulf Coast, TX [IM]

Alternates

James E Degnan, Sparling, WA [U]
(Alt. to Richard W Becker)

David A Dini, Underwriters Laboratories Inc., IL [RT]
(Alt. to Robert L LaRocca)

Daniel J Kissane, Pass & Seymour/Legrand, NY [M]
(Alt. to Jim Pauley)

William Ross McCorcle, American Electric Power, OK [UT]
(Alt. to Ronald L Purvis)

William J McGovern, City of Plano, TX [E]
(Alt. to Raymond W Weber)

Clifford L Rediger, Independent Electrical Contractors Training Fund, CO [IM]
(Alt. to Robert G Wilkinson)

Janet D Skipper, IBEW Local Union 606, FL [L]
(Alt. to Donald M King)

Joseph E Wiehagen, National Association of Home Builders, MD [U]
(Alt. to Lawrence Brown)

Nonvoting

William Burr, Canadian Standards Association, Canada [RT]


Mark W Earley, NFPA Staff Liaison

Andrew M Trotta, US Consumer Product Safety Commission, MD [C]
Code-Making Panel 3
Articles 300, 590, 720, 725, 727, 728, 760, Chapter 9,
Tables 11(A) and (B), and Tables 12(A) and (B)

Richard P Owen, Chair
City of St. Paul, MN [E]
Rep. International Association of Electrical Inspectors

Lawrence S Ayer, Biz Com Electric, Inc., OH [IM]
Paul J Casparro, Scranton Electricians JATC, PA [L]
Rep. International Brotherhood of Electrical Workers
Les Easter, Allied Tube and Conduit, IL [M]
Rep. National Electrical Manufacturers Association
Sanford E Egesdal, Egesdal Associates PLC, MN [M]
Thomas J Guida, Underwriters Laboratories Inc., NY [RT]
Ray R. R Keden, ERICO, Inc., CA [M]
Rep. Building Industry Consulting Services International
Ronald E Maassen, Lemberg Electric Company, Inc., WI [IM]
Rep. National Electrical Contractors Association

Juan C Menendez, Southern California Edison Company, CA [UT]
Rep. Electric Light & Power Group/FEI
Steven J Owen, Steven J. Owen, Inc., AL [IM]
David A Pace, Olin Corporation, AL [U]
Rep. American Chemistry Council
Melvin K Sanders, Things Electrical Co., Inc.
(TECo., Inc.), IA [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.
John E Sleights, St. Paul Travelers, CT [I]

Alternates
Shane M Clary, Bay Alarm Company, CA [M]
(Alt. to Sanford E Egesdal)
Adam D Corbin, Corbin Electrical Services, Inc., NJ [IM]
(Alt. to Lawrence S Ayer)
Danny Liggett, Dupont Company, TX [U]
(Alt. to David A Pace)
T. David Mills, Bechtel Savannah River, Inc., SC [U]
(Alt. to Melvin K Sanders)
Mark C Ode, Underwriters Laboratories Inc., NC [RT]
(Alt. to Thomas J Guida)

Roger S Passmore, Davis Electrical Constructors, Inc., SC [IM]
(Alt. to Steven J Owen)
Marty L Riesberg, IBEW Local Union 22, MD [L]
(Alt. to Paul J Casparro)
George A Straniero, Tyco/AFC Cable Systems, Inc., NJ [M]
(Alt. to Les Easter)
Robert J Walsh, City of Hayward, CA [E]
(Alt. to Richard P Owen)

Nonvoting
Edward C Lawry, Oregon, WI [E]
Mark W Earley, NFPA Staff Liaison

(Member Emeritus)
Code-Making Panel 4
Articles 225, 230

James M Naughton, Chair
IBEW Local Union 103, MA [L]
Rep. International Brotherhood of Electrical Workers

Thomas L Adams, Exelon Corporation, IL [UT]
Rep. Electric Light & Power Group/EEI
Malcolm Allison, Ferraz Shawmut, MA [M]
Robert J Deaton, The Dow Chemical Company, TX [U]
   Rep. Institute of Electrical & Electronics Engineers, Inc.
Howard D Hughes, Hughes Electric Company Inc., AR [IM]
   Rep. National Electrical Contractors Association
Mark C Ode, Underwriters Laboratories Inc., NC [RT]

James J Rogers, Towns of Oak Bluffs, Tisbury, West Tisbury, MA [E]
   Rep. International Association of Electrical Inspectors
John A Sigmund, PPG Industries, Inc., LA [U]
   Rep. American Chemistry Council
John W Young, Siemens Energy & Automation, Inc., GA [M]
   Rep. National Electrical Manufacturers Association
Vincent Zinnante, Advantage Electric, Inc., TX [IM]

Alternates
Paul D Barnhart, Underwriters Laboratories Inc., NC [RT]
   (Alt. to Mark C Ode)
Mark D Gibbs, BWXT Y-12, LLC, TN [U]
   (Alt. to Robert J Deaton)
Kenneth W Hengst, EAS Contracting, LP, TX [IM]
   (Alt. to Vincent Zinnante)
Mark R Hilbert, State of New Hampshire, NH [E]
   (Alt. to James J Rogers)
Mark W Earley, NFPA Staff Liaison

Philip M Piqueira, General Electric Company, CT [M]
   (Alt. to John W Young)
Mark H Sumrall, IBEW Local Union 527, TX [L]
   (Alt. to James M Naughton)
Peter R Walsh, Ferraz Shawmut, MA [M]
   (Alt. to Malcolm Allison)
Code-Making Panel 5  
Articles 200, 250, 280, 285

Ronald J Toomer, Chair  
Toomer Electrical Company Inc., LA [IM]  
Rep. National Electrical Contractors Association

Jeffrey Boksiner, Telcordia Technologies, Inc., NJ [UT]  
Rep. Alliance for Telecommunications Industry Solutions

David Brender, Copper Development Association, Inc., NY [M]  
Rep. Copper Development Association Inc.

Martin J Brett, Jr., Wheatland Tube Company, NJ [M]  
Rep. American Iron and Steel Institute

Paul Dobrowsky, Innovative Technology Services, NY [U]  
Rep. American Chemistry Council

Dan Hammel, IBEW Local Union 704, IA [L]  
Rep. International Brotherhood of Electrical Workers

G. Scott Scott Harding, F. B. Harding, Inc., MD [IM]  

William J Helfrich, US Department of Labor, PA [E]

Michael J Johnston, International Association of Electrical Inspectors, TX [E]

Chuck Mello, Underwriters Laboratories Inc., WA [RT]

Daleep C Mohla, DCM Electrical Consulting Services, Inc., TX [U]  
Rep. Institute of Electrical & Electronics Engineers, Inc.

Gregory J Steinman, Thomas & Betts Corporation, TN [M]  
Rep. National Electrical Manufacturers Association

Rep. Power Tool Institute, Inc

Richard Temblador, Southwire Company, GA [M]  
Rep. The Aluminum Association

C. Douglas White, CenterPoint Energy, Inc., TX [UT]  
Rep. Electric Light & Power Group/EEI

Alternates

Harold G Alexander, American Electric Power, OH [UT]  
(Alt. to C. Douglas White)

Ron D Alley, Northern New Mexico IEC, NM [IM]  
(Alt. to G. Scott Scott Harding)

Joseph P DeGregoria, Underwriters Laboratories Inc., NY [RT]  
(Alt. to Chuck Mello)

Ronald Lai, FCI Electrical, NH [M]  
(Alt. to Gregory J Steinman)

Paul J LeVasseur, Bay City JEATC, MI [L]  
(Alt. to Dan Hammel)

Richard E Loyd, R & N Associates, AZ [M]  
(Alt. to Martin J Brett, Jr.)

Michael E McNeil, FMC Corporation/Bio Polymer, ME [U]  
(Alt. to Paul Dobrowsky)

Nonvoting

Robert A Nelson, Canadian Standards Association, Canada [RT]

Mark W Earley, NFPA Staff Liaison
Code-Making Panel 6
Articles 310, 400, 402, Chapter 9 Tables 5 through 9, and Annex B

Scott Cline, Chair
McMurtrey Electric, Inc., CA [IM]
Rep. National Electrical Contractors Association

Samuel B Friedman, General Cable Corporation, RI [M]
Rep. National Electrical Manufacturers Association

Robert L Huddleston, Jr., Eastman Chemical Company, TN [U]
Rep. American Chemistry Council

G. W. W "Jerry" Kent, Kent Electric & Plumbing Systems, TX [IM]

William F Laidler, South Shore VoTech/IBEW 223, MA [L]
Rep. International Brotherhood of Electrical Workers

L. Bruce McClung, Electrical Safety Consulting Services, Inc., WV [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

Paul R Picard, Tyco/AFC Cable Systems, Inc., MA [M]
Rep. The Aluminum Association

Oran P Post, Akron, OH [E]
Rep. International Association of Electrical Inspectors

Carl Timothy Wall, Alabama Power Company, AL [UT]
Rep. Electric Light & Power Group/EEI

Austin D Wetherell, Underwriters Laboratories Inc., NY [RT]

Joseph S Zimnoch, The Okonite Company, NJ [M]
Rep. Copper Development Association Inc.

Alternates

Jacob Benninger, IBEW Local Union 241 JATC, NY [L]
(Alt. to William F Laidler)

Peter E Bowers, Satellite Electric Company, Inc., MD [IM]
(Alt. to G. W. W "Jerry" Kent)

James M Daly, General Cable, NJ [M]
(Alt. to Joseph S Zimnoch)

Timothy Edwards, Alcan Cable Company, GA [M]
(Alt. to Paul R Picard)

(Alt. to Robert L Huddleston, Jr.)

Mark W Earley, NFPA Staff Liaison

Lowell Lisker, American Insulated Wire Corporation, MA [M]
(Alt. to Samuel B Friedman)

Harry J Sassaman, Forest Electric Corporation, NJ [IM]
(Alt. to Scott Cline)

Bradley J Schmidt, Underwriters Laboratories Inc., IL [RT]
(Alt. to Austin D Wetherell)

John Stacey, City of St. Louis, MO [E]
(Alt. to Oran P Post)

Donald A Voltz, Mustang Engineering, Inc., TX [U]
(Alt. to L. Bruce McClung)
Code-Making Panel 7
Articles 320, 322, 324, 326, 328, 330, 332, 334,
336, 338, 340, 382, 394, 396, 398

Gaylen D Rogers, Chair
Highland, UT [E]
Rep. International Association of Electrical Inspectors

Martin D Adams, Adams Electric, Inc., CO [IM]
Rep. National Electrical Contractors Association
Harry C Brown, IBEW Local Union 606, FL [L]
Rep. International Brotherhood of Electrical Workers
John J Cangemi, Underwriters Laboratories Inc., NY [RT]
James M Daly, General Cable, NJ [M]
Rep. National Electrical Manufacturers Association
Timothy Edwards, Alcan Cable Company, GA [M]
Rep. The Aluminum Association
Chris J Fahrenthold, Design Electric, TX [IM]
Herman J Hall, Austin, TX [M]

Ronald G Nickson, National Multi Housing Council, DC [U]
Rep. Electric Light & Power Group/EEI
Gregory L Runyon, Eli Lilly and Company, IN [U]
Rep. American Chemistry Council
David E Schumacher, Associated Builders & Contractors, Inc., IA [IM]
H. R. Stewart, HRS Consulting, TX [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.
George A Straniero, Tyco/AFC Cable Systems, Inc., NJ [M]
Rep. Copper Development Association Inc.

Alternates

William B Crist, Houston Stafford Electric Company, TX [IM]
(Alt. to Chris J Fahrenthold)
James D Erwin, Celanese, Ltd., TX [U]
(Alt. to Gregory L Runyon)
Rogers Hester, Jr., Encore Wire Limited, TX [M]
(Alt. to George A Straniero)
James K Hinrichs, State of Washington, WA [E]
(Alt. to Gaylen D Rogers)
Jacob Killinger, Underwriters Laboratories Inc., IL [RT]
(Alt. to John J Cangemi)

Mark W Earley, NFPA Staff Liaison

Samuel R LaDart, City of Memphis, TN [L]
(Alt. to Harry C Brown)
David Mercier, Southwire Company, GA [M]
(Alt. to James M Daly)
Dennis A Nielsen, Lawrence Berkeley National Laboratory, CA [U]
(Alt. to H. R. Stewart)
Peter Pollak, The Aluminum Association, Inc., VA [M]
(Alt. to Timothy Edwards)
Thomas H Wood, Cecil B. Wood Inc., IL [IM]
(Alt. to Martin D Adams)
Code-Making Panel 8
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378, 380, 384, 386, 388, 390, 392
Chapter 9, Tables 1 through 4, and Annex C

Julian R Burns, Chair
Burns Electrical/Quality Power Solutions, Inc., NC [IM]

Joseph Dabe, City of St. Paul, MN [L]
Rep. International Brotherhood of Electrical Workers

George R Dauberger, Thomas & Betts Corporation,
TN [M]
Rep. National Electrical Manufacturers Association

James C Dollins, Tyco/AFC Cable Systems, MA [M]
Rep. The Aluminum Association

James T Dwight, Sasol North America, Inc., LA [U]
Rep. American Chemistry Council

M. Shan Griffith, Kellogg, Brown & Root, Inc., TX [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

David G Humphrey, County of Henrico, Virginia, VA [E]
Rep. International Association of Electrical Inspectors

Richard J Berman, Underwriters Laboratories Inc., IL [RT]
(Alt. to George F Walbrecht)

Joyce Evans Blom, The Dow Chemical Company, CA [U]
(Alt. to James T Dwight)

Duane A Carlson, PRS Consulting Engineers, WA [U]
(Alt. to M. Shan Griffith)

Charles W Forsberg, Shaker Heights, OH [M]
(Alt. to David H Kendall)

James M Imlah, City of Hillsboro, OR [E]
(Alt. to David G Humphrey)

Mark W Earley, NFPA Staff Liaison

Alternates

Kevin J Lippert, Eaton Corporation, PA [M]
(Alt. to George R Dauberger)

Gregory L Maurer, Wheatland Tube Company, AR [M]
(Alt. to Richard E Loyd)

Gary W Pemble, Montana Electrical JATC, MT [L]
(Alt. to Joseph Dabe)

C. Ernest Reynolds, Hatfield-Reynolds Electric Company, AZ [IM]
(Alt. to Julian R Burns)

Richard Temblador, Southwire Company, GA [M]
(Alt. to James C Dollins)
Robert A McCullough,  
Chair  
Ocean County Construction Inspection Department, NJ [E]  
Rep. International Association of Electrical Inspectors

Rodney D Belisle,  
NECA-IBEW Electrical Training Trust, OR [L]  
Rep. International Brotherhood of Electrical Workers

Billy Breitkreutz,  
Fluor Corporation, TX [U]  

Richard P Fogarty,  
Consolidated Edison Company of New York, Inc., NY [UT]  
Rep. Electric Light & Power Group/EEI

Frederic P Hartwell,  
Hartwell Electrical Services, Inc., MA [SE]  

Thomas J LeMay,  
LeMay Electric, Inc., GA [IM]  

Robert D Osborne,  
Underwriters Laboratories Inc., NC [RT]

Bradford D Rupp,  
Allied Moulded Products, Inc., OH [M]  
Rep. National Electrical Manufacturers Association

Sukanta Sengupta,  
FMC Corporation, NJ [U]  
Rep. Institute of Electrical & Electronics Engineers, Inc.

Monte Szendre,  
Wilson Construction Company, OR [IM]  
Rep. National Electrical Contractors Association

Ralph H Young,  
Eastman Chemical Company, TN [U]  
Rep. American Chemistry Council

Alternates

Charles L Boynton,  
The DuPont Company, TX [U]  
(Alt. to Ralph H Young)

Kevin J Breen,  
Breen Electrical Contractors Inc., NY [IM]  
(Alt. to Thomas J LeMay)

James C Carroll,  
Square D Company/Schneider Electric, TN [M]  
(Alt. to Bradford D Rupp)

Kenneth L McKinney, Jr.,  
Underwriters Laboratories Inc., NC [RT]  
(Alt. to Robert D Osborne)

Mark W Earley, NFPA Staff Liaison

James C Missildine, Jr.,  
Southern Company Services, Inc., AL [UT]  
(Alt. to Richard P Fogarty)

Paul W Myers,  
Innovene LLC, OH [U]  
(Alt. to Sukanta Sengupta)

Donald R Offerdahl,  
North Dakota State Electrical Board, ND [E]  
(Alt. to Robert A McCullough)

Rhett A Roe,  
IBEW Local Union 26 JATC, MD [L]  
(Alt. to Rodney D Belisle)
Code-Making Panel 10
Articles 240, 780

James T Dollard, Jr., Chair
IBEW Local Union 98, PA [L]
Rep. International Brotherhood of Electrical Workers

Charles K Blizard, American Electrical Testing
Company, Inc., MA [IM]

Madeline Borthick, IEC of Houston, Inc., TX [IM]

Dennis M Darling, Ayers, Lewis, Norris & May, Inc.,
MI [U]
Rep. Institute of Electrical & Electronics Engineers,
Inc.

Charles Eldridge, Indianapolis Power & Light Company,
IN [UT]
Rep. Electric Light & Power Group/EEI

C. W. W Kimblin, Eaton Electrical Corporation, PA [M]
Rep. National Electrical Manufacturers Association

Robert W Mount, Jr., Hussmann Corporation, MO [M]
Rep. Air-Conditioning and Refrigeration Institute

George J Ockuly, O’Fallon, MO [M]

Richard Sobel, Quantum Electric Corporation, NY [IM]
Rep. National Electrical Contractors Association

Gerald W Williams, County of Ventura, California,
CA [E]
Rep. International Association of Electrical Inspectors

Alternates

Robert R Gage, National Grid, NY [UT]
(Alt. to Charles Eldridge)

Roderic Hageman, PRIT Service, Inc., IL [IM]
(Alt. to Charles K Blizard)

Robert J Kauer, Middle Department Inspection Agency,
Inc., PA [E]
(Alt. to Gerald W Williams)

Frank G Ladonne, Underwriters Laboratories Inc.,
IL [RT]
(Alt. to John R Kovacik)

Richard E Lofton, IBEW Local Union 280, OR [L]
(Alt. to James T Dollard, Jr.)

Mark W Earley, NFPA Staff Liaison

Alan Manche, Square D Company/Schneider Electric,
KY [M]
(Alt. to C. W. W Kimblin)

Vincent J Saporita, Cooper Bussmann, MO [M]
(Alt. to George J Ockuly)

Steve A Struble, Freeman’s Electric Service, Inc.,
SD [IM]
(Alt. to Madeline Borthick)

Steven E Townsend, General Motors Corporation,
MI [U]
(Alt. to Dennis M Darling)
Code-Making Panel 11
Articles 409, 430, 440, 460, 470, Annex D, Example D8

Wayne Brinkmeyer, Chair
Britain Electric Company, TX [IM]
Rep. National Electrical Contractors Association

Rick L Bunch, Tecumseh Products Company, MI [M]
Rep. Air-Conditioning and Refrigeration Institute

J. Ron Caccamese, Alterman Electric Co., Ltd., TX [L]
Rep. International Brotherhood of Electrical Workers

Terry D Cole, Hamer Electric, Inc., WA [IM]

Robert G Fahey, City of Janesville, WI [E]
Rep. International Association of Electrical Inspectors

William D Glover, PPG Industries, Inc., WV [U]
Rep. American Chemistry Council

Charles A Goetz, Underwriters Laboratories Inc., IL [RT]

Paul E Guidry, Fluor Enterprises, Inc., TX [U]

Leo H Haas, Jr., CenterPoint Energy, Inc., TX [UT]
Rep. Electric Light & Power Group/EEI

Alternates

Larry W Burns, Burns Electric, Inc., TX [IM]
(Alt. to Terry D Cole)

Ralph M Esemplare, Consolidated Edison Company of New York, NY [UT]
(Alt. to Leo H Haas, Jr.)

James M Fahey, IBEW Local Union 103, MA [L]
(Alt. to J. Ron Caccamese)

Stanley J Folz, Morse Electric Company, NV [IM]
(Alt. to Wayne Brinkmeyer)

Barry G Karnes, Underwriters Laboratories Inc., CA [RT]
(Alt. to Charles A Goetz)

Robert J Keough, Emerson Motor Company, MO [M]
(Alt. to James R Wright)

Paul S Hamer, Chevron Energy Technology Company, CA [U]
Rep. American Petroleum Institute

Vincent J Saporita, Cooper Bussmann, MO [M]
Rep. Institute of Electrical & Electronics Engineers, Inc.

Lawrence E Todd, Intertek Testing Services NA, Inc., OR [RT]

Ron Widup, Shermco Industries, Inc., TX [IM]
Rep. InterNational Electrical Testing Association

James R Wright, Siemens Energy & Automation, Inc., IL [M]
Rep. National Electrical Manufacturers Association

Alternates

Thomas E Moore, City of North Royalton, OH [E]
(Alt. to Robert G Fahey)

Arthur S Neubauer, Colonial Pipeline Company, GA [U]
(Alt. to Paul S Hamer)

George J Ockuly, O'Fallon, MO [M]
(Alt. to Vincent J Saporita)

Charles L Powell, Eastman Chemical Company, TN [U]
(Alt. to William D Glover)

(Alt. to Lynn F Saunders)

Russell A Tiffany, Johnson Controls, Inc., PA [M]
(Alt. to Rick L Bunch)

Mark W Earley, NFPA Staff Liaison
Code-Making Panel 12
Articles 610, 620, 625, 630, 640, 645, 647, 650, 660, 665, 668, 669, 670, 685,
Annex D, Examples D9 and D10

Timothy M Croushore, Chair
Allegheny Power, PA [UT]
Rep. Electric Light & Power Group/EEI

Kent B Givens, Alcoa, Inc., TX [M]
Rep. The Aluminum Association
(VL to 610, 625, 630, 645, 660, 665, 668, 669, 685)

Thomas L Hedges, Hedges Electric & Construction Inc., CA [IM]
Rep. National Electrical Contractors Association

Ron L Janikowski, City of Wausau, Wisconsin, WI [E]
Rep. International Association of Electrical Inspectors

Robert E Johnson, ITE Safety, MA [U]
Rep. Information Technology Industry Council
(VL to 640, 645, 647, 685)

Robert A Jones, Independent Electrical Contractors, Inc., TX [IM]

Andy Juhasz, Kone, Inc., IL [M]
(VL to 610, 620, 630)

Todd Lottmann, Cooper Bussmann, MO [M]
Rep. National Electrical Manufacturers Association

Sam Marcovici, New York City Department of Buildings, NY [E]

John H Mortimer, Inductotherm Corporation, NJ [M]
(VL to 610, 630, 665, 668, 669)

Ralph C Prichard, Hercules Incorporated, DE [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

David R Quave, IBEW Local Union 903, MS [L]
Rep. International Brotherhood of Electrical Workers

Craig Sato, Underwriters Laboratories Inc., CA [RT]

Arthur E Schlueter, Jr., A. E. Schlueter Pipe Organ Company, GA [M]
Rep. American Institute of Organ Builders
(VL to 640, 650)

Kenneth White, Olin Corporation, NY [U]
Rep. American Chemistry Council

Alternates

(Alt. to Ralph C Prichard)

Jeffrey W Blain, Schindler Elevator Corporation, NY [M]
(VL to 610, 625, 630)
(Alt. to Andy Juhasz)

Thomas M Burke, Underwriters Laboratories Inc., CA [RT]
(Alt. to Craig Sato)

Jeffrey L Holmes, IBEW Local Union 1 JATC, MO [L]
(Alt. to David R Quave)

Tim McClintock, Wayne County, Ohio, OH [E]
(Alt. to Ron L Janikowski)

Roger D McDaniel, Georgia Power Company, GA [UT]
(Alt. to Timothy M Croushore)

Peter Pollak, The Aluminum Association, Inc., VA [M]
(VL to 610, 625, 630, 645, 660, 665, 668, 669, 685)
(Alt. to Kent B Givens)

Lori L Tennant, Square D Company/Schneider Electric, NC [M]
(Alt. to Todd Lottmann)

George S Tidden, George’s Electrical Service Inc., TX [IM]
(Alt. to Robert A Jones)

Charles M Trout, Maron Electric Company, FL [IM]
(Alt. to Thomas L Hedges)

Robert C Turner, Oxford, MD [M]
(VL to 610, 630, 665, 668, 669)
(Alt. to John H Mortimer)

Nonvoting

Andre R Cartal, Yardley, PA [E]
(Member Emeritus)

Mark W Earley, NFPA Staff Liaison
Code-Making Panel 13

Articles 445, 455, 480, 690, 692, 695, 700, 701, 702, 705

Thomas H Wood, Chair
Cecil B. Wood Inc., IL [IM]
Rep. National Electrical Contractors Association

Kenneth Krastins, Plug Power, Inc., NY [M]
Rep. US Fuel Cell Council
(VL to 690, 692, 705)

James S Nasby, Master Control Systems, Inc., IL [M]
Rep. National Electrical Manufacturers Association

Steven H Pasternack, Intertek Testing Services NA, Inc., NY [RT]

Elliot Rappaport, Electro Technology Consultants, Inc., FL [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

Duke W Schamel, Electrical Service Solutions, Inc., CO [IM]

Todd W Stafford, National Joint Apprentice & Training Committee, TN [L]
Rep. International Brotherhood of Electrical Workers

Herbert V Whitall, Electrical Generating Systems Association, FL [M]

Timothy P Zgonena, Underwriters Laboratories Inc., IL [RT]

Alternates

Paul D Barnhart, Underwriters Laboratories Inc., NC [RT]
(Alt. to Timothy P Zgonena)

Daniel Batta, Constellation Power Source Generation, Inc., MD [UT]
(Alt. to Barry N Hornberger)

Ron B Chilton, North Carolina Department of Insurance, NC [E]
(Alt. to Tarry L Baker)

Larry D Cogburn, Cogburn Bros, Inc., FL [IM]
(Alt. to Thomas H Wood)

Brian L Crise, NIETC, OR [L]
(Alt. to Todd W Stafford)

Steven J Fredette, UTC Fuel Cells, LLC, CT [M]
(VL to 690, 692, 705)
(Alt. to Kenneth Krastins)

Nonvoting

David Mascarenhas, Canadian Standards Association, Canada [RT]

Mark W Earley, NFPA Staff Liaison
Code-Making Panel 14
Articles 500, 501, 502, 503, 504, 505, 506, 510, 511, 513, 514, 515, 516

Donald Cook, Chair
Shelby County Development Services, AL [E]
Rep. International Association of Electrical Inspectors

Troy Beall, B & D Industries, Inc., NM [IM]
Rep. National Electrical Contractors Association
Marc J Bernsen, IBEW Local Union 291, ID [L]
Rep. International Brotherhood of Electrical Workers
Edward M Briesch, Underwriters Laboratories Inc., IL [RT]

Alternates
Donald W Ankele, Underwriters Laboratories Inc., IL [RT]
(Alt. to Edward M Briesch)
A. W Ballard, Crouse-Hinds , NY [M]
(Alt. to Joseph H Kuczka)
Mark W Bonk, Cargill Incorporated, MN [U]
(Alt. to Mark C Wirfs)
Dave Burns, Shell Exploration & Production Company, LA [U]
(Alt. to Mark Goodman)
Larry E Fuhrman, City of Titusville, FL [E]
(Alt. to Donald Cook)
(Alt. to David B Wechsler)

Alternates
Nicholas P Ludlam, FM Global, United Kingdom [H]
(Alt. to William G Lawrence, Jr.)
Christopher P. O’Neil, NSTAR Electric & Gas Corporation, MA [UT]
(Alt. to Mike O’Meara)
Ted H Schnaare, Rosemount Incorporated, MN [M]
(Alt. to L. Evans Massey)
John L Simmons, Florida East Coast JATC, FL [L]
(Alt. to Marc J Bernsen)
Donald W Zipse, Zipse Electrical Engineering Inc., PA [U]
(Alt. to James D Cospolich)

Nonvoting
Timothy J Pope, Canadian Standards Association, Canada [RT]
Eduardo N Solano, Estudio Ingeniero Solano S.A., Argentina [SE]

Mark W Earley, NFPA Staff Liaison

Nonvoting
Fred K Walker, US Department of the Air Force, FL [U]
Rep. TC on Airport Facilities
Code-Making Panel 15
Articles 517, 518, 520, 525, 530, 540

Donald J Talka, Chair
Underwriters Laboratories Inc., NY [RT]

James R Duncan, Sparling Electrical Engineering & Technology Consulting, WA [U]
   Rep. Institute of Electrical & Electronics Engineers, Inc.
Ronald E Duren, PacifiCorp, WA [UT]
   Rep. Electric Light & Power Group/EEI
Douglas S Erickson, American Society for Healthcare Engineering, VI [U]
Mitchell K Hefter, Entertainment Technology/Genlyte, TX [IM]
   Rep. Illuminating Engineering Society of North America
   (VL to 518, 520, 525, 530, 540)
Kim Jones, Funtastic Shows, OR [U]
   (VL to 525)
Edwin S Kramer, Radio City Music Hall, NY [L]
   Rep. International Alliance of Theatrical Stage Employees
   (VL to 518, 520, 525, 530, 540)
Larry Lau, US Department of Veterans Affairs, DC [U]
   (VL to 517, 518)
Dennis W Marshall, TAG Electric Companies, TX [IM]

Eugene E Morgan, County of Clackamas, Oregon, OR [E]
   Rep. International Association of Electrical Inspectors
Hugh O Nash, Jr., Nash Lipsey Burch, LLC, TN [SE]
   Rep. TC on Electrical Systems
Bruce D Shelly, Shelly Electric Company, Inc., PA [IM]
   Rep. National Electrical Contractors Association
Michael D Skinner, CBS Studio Center, CA [U]
   Rep. Alliance of Motion Picture and Television Producers
   (VL to 518, 520, 525, 530, 540)
Kenneth E Vannice, Leviton Manufacturing Company Inc., OR [M]
   Rep. US Institute for Theatre Technology
   (VL to 518, 520, 525, 530, 540)
Michael Velvikis, High Voltage Maintenance Corporation, WI [IM]
   Rep. InterNational Electrical Testing Association
Andrew White, IBEW Local Union 3, NY [L]
   Rep. International Brotherhood of Electrical Workers
James L. Wiseman, Square D Company/Schneider Electric, TN [M]
   Rep. National Electrical Manufacturers Association

Alternates

James L Brown, Detroit Edison, DTE Energy, MI [UT]
   (Alt. to Ronald E Duren)
Matthew B Dozier, IDesign Services, TN [U]
   (Alt. to James R Duncan)
Samuel B Friedman, General Cable Corporation, RI [M]
   (Alt. to James L. Wiseman)
Stephen M Lipster, The Electrical Trades Center, OH [L]
   (Alt. to Andrew White)
Joseph P Murnane, Jr., Underwriters Laboratories Inc., NY [RT]
   (Alt. to Donald J Talka)

Mark W Earley, NFPA Staff Liaison

Marcus R Sampson, Minnesota Department of Labor & Industry, MN [E]
   (Alt. to Eugene E Morgan)
James C Seabury, III, Enterprise Electric, LLC, TN [IM]
   (Alt. to Dennis W Marshall)
Steven R Terry, Electronic Theatre Controls Inc., NY [M]
   (VL to 518, 520, 525, 530, 540)
   (Alt. to Kenneth E Vannice)

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Code-Making Panel 16
Articles 770, 800, 810, 820, 830

S. D. Kahn, Chair
Tri-City Electric Company, Inc., CA [IM]
Rep. National Electrical Contractors Association

J. Robert Boyer, GE Infrastructure, Security, NJ [M]
Rep. National Electrical Manufacturers Association

James E Brunssen, Telcordia, NJ [U]
Rep. Alliance for Telecommunications Industry Solutions

Larry Chan, City of New Orleans, LA [E]
Rep. International Association of Electrical Inspectors

Gerald Lee Dorna, Belden Wire & Cable, IN [M]
Rep. Insulated Cable Engineers Association Inc

Roland W Gubisch, Intertek Testing Services NA, Inc., MA [RT]

Robert L Hughes, The DuPont Company, GA [U]
Rep. American Chemistry Council

Robert W Jensen, dbi-Telecommunication Infrastructure Design, TX [M]
Rep. Building Industry Consulting Services International

Steven C Johnson, Time Warner Cable, NC [UT]
Rep. National Cable & Telecommunications Association

Ronald G Jones, Ronald G. Jones, P.E., TX [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

Harold C Ohde, IBEW-NECA Technical Institute, IL [L]
Rep. International Brotherhood of Electrical Workers

Luigi G Prezioso, M. C. Dean, Inc., VA [IM]

James W Romlein, MV Labs LLC, WI [M]
Rep. Telecommunications Industry Association

Susan L Stene, Underwriters Laboratories Inc., CA [RT]

Kyle E Todd, Entergy Corporation, TX [UT]
Rep. Electric Light & Power Group/EEI

Alternates

Terry C Coleman, National Joint Apprentice & Training Committee, TN [L]
(Alt. to Harold C Ohde)

Timothy D Cooke, Times Fiber Communications, Inc., VA [UT]
(Alt. to Steven C Johnson)

Bill Hopple, Tyco/SimplexGrinnell, CA [M]
(Alt. to J. Robert Boyer)

Randolph J Ivans, Underwriters Laboratories Inc., NY [RT]
(Alt. to Susan L Stene)

Stanley Kaufman, CableSafe, Inc./OFS, GA [M]
(Alt. to Gerald Lee Dorna)

William J McCoy, Verizon Wireless, TX [U]
(Alt. to Ronald G Jones)

Robert P McGann, City of Cambridge, MA [E]
(Alt. to Larry Chan)

W. Douglas Pirkle, Pirkle Electric Company, Inc., GA [IM]
(Alt. to S. D. Kahn)

David B Schrembeck, DBS Communications, Inc., OH [IM]
(Alt. to Luigi G Prezioso)

Mark W Earley, NFPA Staff Liaison
Code-Making Panel 17
Articles 422, 424, 426, 427, 680, 682

Don W Jhonson, Chair
Interior Electric, Inc., FL [IM]
Rep. National Electrical Contractors Association

Thomas V Blewitt, Underwriters Laboratories Inc., NY [RT]
Richard J Cripps, Association of Home Appliance Manufacturers, VA [M]
(PV to 422, 424)
Paul Crivell, Camp, Dresser & McKee Inc., WA [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.
Larry M Eils, National Automatic Merchandising Association, HI [M]
(PV to 422)
Christopher S Gill, New York Board of Fire Underwriters, NY [E]
Bruce R Hirsch, Baltimore Gas & Electric Company, MD [UT]
Rep. Electric Light & Power Group/EEI
Robert M Milatovich, Clark County Building Department, NV [E]
Rep. International Association of ElectricalInspectors

Jurgen Pannock, Whirlpool Corporation, TN [M]
Rep. Air-Conditioning and Refrigeration Institute
(PV to 422, 424)
Marcos Ramirez, Hatfield-Reynolds Electric company, AZ [IM]
Brian E Rock, Hubbell Incorporated, CT [M]
Rep. National Electrical Manufacturers Association
Kenneth M Shell, Tyco Thermal Controls, CA [M]
Rep. Copper Development Association Inc.
(PV to 426, 427)
Rep. American Chemistry Council
(PV to 422, 424, 426, 427, 682)
Lee L West, Balboa Instruments, Inc., CA [M]
Rep. National Spa and Pool Institute
(PV to 680)
Randy J Yasenchak, IBEW Local Union 607, PA [L]
Rep. International Brotherhood of Electrical Workers

Alternates
Dennis L Baker, Springs & Sons Electrical Contractors Inc., AZ [IM]
(Alt. to Marcos Ramirez)
Aaron B Chase, Leviton Manufacturing Company, Inc., NY [M]
(Alt. to Brian E Rock)
James E Maldonado, City of Tempe, AZ [E]
(Alt. to Robert M Milatovich)
Wayne E Morris, Association of Home Appliance Manufacturers, DC [M]
(PV to 422, 424)
(Alt. to Richard J Cripps)
Brian Myers, IBEW Local Union 98, PA [L]
(Alt. to Randy J Yasenchak)

Ronald F Schapp, Intertek Testing Services NA, Inc., OH [RT]
(Voting Alt. to Intertek Rep.)
Gary L Siggins, Underwriters Laboratories Inc., CA [RT]
(Alt. to Thomas V Blewitt)
Joel G Solis, Air-Conditioning & Refrigeration Institute, VA [M]
(PV to 422, 424)
(Alt. to Jurgen Pannock)
Robert E Wisenburg, Coates Heater Company, Inc., WA [M]
(PV to 680)
(Alt. to Lee L West)

Nonvoting
Andrew M Trotta, US Consumer Product Safety Commission, MD [C]

Mark W Earley, NFPA Staff Liaison

Code-Making Panel 18
Articles 406, 410, 411, 600, 605

Michael N Ber, Chair
IEC, Houston, TX [IM]

Charles L Boynton, The DuPont Company, TX [U]
Rep. American Chemistry Council

Frederick L Carpenter, Lithonia Lighting, GA [M]
Rep. National Electrical Manufacturers Association

Paul Costello, NECA and IBEW Local 90 JATC, CT [L]
Rep. International Brotherhood of Electrical Workers

Kenneth F Kempel, Underwriters Laboratories Inc., NC [RT]

Rep. International Sign Association
(Alt. to 600)

Steven A Larson, BWXT Y-12, LLC, TN [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.

Michael S O’Boyle, Lightolier Division of Genlyte Group, MA [M]
Rep. American Lighting Association
(Alt. to 410, 411)

Timothy S Owens, City of Santa Clara, CA [E]
Rep. International Association of Electrical Inspectors

Jim F Pierce, Intertek Testing Services NA, Inc., OR [RT]

Michael W Smith, Schaeffer Electric Company, MO [IM]
Rep. National Electrical Contractors Association

Sondra K Todd, Westar Energy, Inc., KS [UT]
Rep. Electric Light & Power Group/EEI

Alternates

Steve Campolo, Leviton Manufacturing Company, Inc., NY [M]
(Alt. to Frederick L Carpenter)

Robert T Carlock, R. T. Carlock Company, TN [IM]
(Alt. to Michael N Ber)

Melvyn J Kochan, Young Electric Sign Company, NV [M]
(Alt. to Stephen G Kieffer)
(Alt. to 600)

Charles S Kurten, Underwriters Laboratories Inc., NY [RT]
(Alt. to Kenneth F Kempel)

Amos D Lowrance, Jr., City of Chattanooga, Tennessee, TN [E]
(Alt. to Timothy S Owens)

Mark W Earley, NFPA Staff Liaison

Terry K McGowan, Lighting Ideas, Inc., OH [M]
(Alt. to Michael S O’Boyle)

Ronald Michaelis, South Bend Vicinity Electrical JATC, IN [L]
(Alt. to Paul Costello)

(Alt. to Charles L Boynton)
Code-Making Panel 19
Articles 545, 547, 550, 551, 552, 553, 555, 604, 675,
Annex D Examples D11 and D12

Leslie Sabin-Mercado, Chair
San Diego Gas & Electric Company, CA [UT]
Rep. Electric Light & Power Group/EEI

Barry Bauman, Alliant Energy, WI [U]
Rep. American Society of Agricultural & Biological Engineers

William Bruce Bruce Bowman, Fox Systems, Inc., GA [IM]

Roger L Carlson, Monaco Coach Corporation, IN [M]
(VL to 550, 551, 552)

Monte R Ewing, Wisconsin Department of Commerce, WI [E]
Rep. International Association of Electrical Inspectors

James W Finch, Kampgrounds of America, Inc., MT [U]
(VL to 550, 551, 552, 555)

Bruce A Hopkins, Recreation Vehicle Industry Association, VA [M]
(VL to 550, 551, 552)

Thomas R Lichtenstein, Underwriters Laboratories Inc., IL [RT]

Linda J Little, IBEW Local 1 Electricians JATC, MO [L]
Rep. International Brotherhood of Electrical Workers

Timothy P McNeive, Thomas & Betts Corporation, TN [M]
Rep. National Electrical Manufacturers Association

John Mikel, Skyline Corporation, IN [M]
Rep. Manufactured Housing Institute

Tug L Miller, National Association of RV Parks & Campgrounds, CA [U]
Rep. National Assn. of RV Parks & Campgrounds
(VL to 550, 551, 552)

Kenneth Weakley, Mountain Electric, Inc., CA [IM]
Rep. National Electrical Contractors Association

Michael L Ziemer, RADCO, CA [RT]
(VL to 545, 550, 551, 552)

Alternates

Glenn H Ankenbrand, Delmarva Power, MD [UT]
(Alt. to Leslie Sabin-Mercado)

Steven J Blais, EGS Electrical Group, IL [M]
(Alt. to Timothy P McNeive)

Joseph M Bolesina, Pinellas County Building Inspections, FL [E]
(Alt. to Monte R Ewing)

William (Billy) E Duggins, San Diego Electrical Training Center, CA [L]
(Alt. to Linda J Little)

David W Johnson, CenTex IEC, TX [IM]
(Alt. to William Bruce Bruce Bowman)

Kent Perkins, Recreation Vehicle Industry Association, VA [M]
(VL to 550, 551, 552)
(Alt. to Bruce A Hopkins)

Mark W Earley, NFPA Staff Liaison

Michael J Slifka, PFS Corporation, WI [M]
(VL to 550, 551, 552)
(Alt. to John Mikel)

Raymond F Tucker, Consulting Professional Engineer/RADCO, CA [RT]
(VL to 545, 550, 551, 552)
(Alt. to Michael L Ziemer)

Eugene W Wirth, Underwriters Laboratories Inc., WA [RT]
(Alt. to Thomas R Lichtenstein)
Committee Scope: This Committee shall have primary responsibility for documents on minimizing the risk of electricity as a source of electric shock and as a potential ignition source of fires and explosions. It shall also be responsible for text to minimize the propagation of fire and explosions due to electrical installations.

The National Electrical Code Committee proposes for adoption its Report on Comments to NFPA 70, National Electrical Code. NFPA 70-2008 is published in Volume 4 of the 2007 National Fire Codes and is in separate pamphlet form. This Report has been submitted to letter ballot of the Code-Making Panels of the National Electric Code Committee and the results of the ballot can be found in the Report. This Report has also been submitted to letter ballot of the Technical Correlating Committee which consists of 11 voting members. It was voted unanimously affirmative to release this Report.
Key to Comment Headings

The first line of every proposal includes the following information:

<table>
<thead>
<tr>
<th>Document No.</th>
<th>Proposal No.</th>
<th>Log No.</th>
<th>Paragraph Reference</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>6</td>
<td>38</td>
<td>3.4</td>
<td>Accept</td>
</tr>
</tbody>
</table>

Example: 101-6 Log #38 **Final Action: Accept** (3.4)

**TYPES OF ACTION**

- **P** Partial Revision
- **C** Complete Revision
- **N** New Document
- **R** Reconfirmation
- **W** Withdrawal

The following classifications apply to Committee members and represent their principal interest in the activity of the Committee.

1. **M** Manufacturer: A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.

2. **U** User: A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.

3. **IM** Installer/Maintainer: A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.

4. **L** Labor: A labor representative or employee concerned with safety in the workplace.

5. **RT** Applied Research/Testing Laboratory: A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.

6. **E** Enforcing Authority: A representative of an agency or an organization that promulgates and/or enforces standards.

7. **I** Insurance: A representative of an insurance company, broker, agent, bureau, or inspection agency.

8. **C** Consumer: A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (2).

9. **SE** Special Expert: A person not representing (1) through (8) and who has special expertise in the scope of the standard or portion thereof.

**NOTE 1:** “Standard” connotes code, standard, recommended practice, or guide.

**NOTE 2:** A representative includes an employee.

**NOTE 3:** While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of member or unique interests need representation in order to foster the best possible Committee deliberations on any project. In this connection, the Standards Council may make such appointments as it deems appropriate in the public interest, such as the classification of “Utilities” in the National Electrical Code Committee.

**NOTE 4:** Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.
**FORM FOR FILING NEC® NOTICE OF INTENT TO MAKE A MOTION (NITMAM)**
**AT AN ASSOCIATION TECHNICAL MEETING**
**2007 ANNUAL REVISION CYCLE**

**FINAL DATE FOR RECEIPT OF NEC® NITMAM: 5:00 pm EDST, May 4, 2007 (NEC only)**

If you have questions about filling out or filing the NEC® NITMAM, please contact the Codes and Standards Administration at 617-984-7249

For further information on the Codes- and Standards-Making Process see the NFPA website (www.nfpa.org)

<table>
<thead>
<tr>
<th>Date</th>
<th>8/10/2005</th>
<th>Name</th>
<th>John B. Smith</th>
<th>Tel. No.</th>
<th>617-555-1212</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company or Affiliation</td>
<td>John B. Smith Consulting</td>
<td>Email Address</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street Address</td>
<td>9 Seattle Street</td>
<td>City</td>
<td>Seattle</td>
<td>State</td>
<td>WA</td>
</tr>
<tr>
<td>Zip</td>
<td>02255</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

1. **(a) NFPA Document (include Number and Title)** National Fire Alarm Code/NFPA 72 1999ed
   **(b) Proposal or Comment Number** 72-5
   **(c) Section/Paragraph** 1.5.8.1

2. **Motion to be made.** Please check one (See also 4.6 of the Regulations Governing Committee Projects):
   **(a) Proposal**
   - X (1) Accept.
   - (2) Accept an Identifiable Part.*
   - (3) Accept as modified by the TC.
   - (4) Accept an Identifiable Part as modified by the TC.*

   **(b) Comment**
   - (1) Accept.
   - (2) Accept an Identifiable Part.*
   - (3) Accept as modified by the TC.
   - (4) Accept an Identifiable Part as modified by the TC.*
   - (5) Reject
   - (6) Reject an Identifiable Part.*

   **(c) Return Technical Committee Report for Further Study**
   - (1) Return entire Report.
   - (2) Return a portion of a Report in the form of a proposal and related comment(s).
   - (3) Return a portion of a Report in the form of identifiable part(s) of a proposal and related comment(s). (Identify the specific portion of the proposal and the related comments below)*

   * Clearly identify the Identifiable Part(s) indicated above (use separate sheet if required).

3. I am entitled to make this motion in accordance with 4.6.8 of the Regulations Governing Committee Projects, as follows [check (a), (b), or (c)]:
   **(a) X** This motion may be made by the original submitter or their designated representative, and I am the [if you check (a) indicate one of the following]:
   - X I am the original submitter, or
   - I am the submitter's designated representative (attach written authorization signed by the original submitter), or
   - I am an Organization Member Delegate permitted to represent the submitter on behalf of the Organization Member in accordance with 4.6.8.2.
   **(b) This motion may be made by a Technical Committee Member and I am a Member of the responsible Technical Committee.**
   **(c) This motion may be made by anyone.**

   (Form continued on next page)
4. Comments or Clarification (optional): This NEC® NITMAM will be reviewed by a Motions Committee. In addition to determining whether your Amending Motion is proper, the Panel may take other actions as described in 2.3 of the Technical Meeting Convention Rules as follows:

Restating and Grouping of Motions. Upon request or on its own initiative, and in consultation with the mover(s), the Motions Committee may: (a) restate an Amending Motion to facilitate the making of a proper motion or to clarify the intent of the mover; and (b) group Amending Motions that are dependent on one another into a single Amending Motion. Dependent motions are motions that the mover(s) wish to be considered by the assembly and voted on as single up or down package. In addition to the foregoing, the Motions Committee may take such other actions or make such other recommendations as will facilitate the fair and efficient consideration of motions within the available time.

The NFPA Staff may contact you to clarify your motion or to consult on the permitted actions in 2.3. If you have any comments, suggestions or requests of the Motions Committee as it reviews your NITMAM and considers actions permitted in 2.3, please provide them below. (Use additional sheet if necessary):

_____________________________________________________________________________________________________________
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Name (please print): John B. Smith

Signature (required):

(Note: This NEC® NITMAM will be reviewed, and if proper, your Amending Motion will be certified in accordance with the Technical Meeting Convention Rules and posted on the NFPA website by May 18, 2007. Documents that have NEC® Certified Amending Motions will be considered at the June 2007 Annual Meeting Technical Committee Report Session. In order to have your Certified Amending Motion considered at that meeting, you must appear, sign in, and make the motion as prescribed in the Convention Rules).

PLEASE USE A SEPARATE NITMAM FORM FOR EACH NEC® AMENDING MOTION YOU WISH TO MAKE

Mail to: Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471
NFPA Fax: (617) 770-3500
FORM FOR FILING NEC® NOTICE OF INTENT TO MAKE A MOTION (NITMAM)  
AT AN ASSOCIATION TECHNICAL MEETING  
2007 ANNUAL REVISION CYCLE  

FINAL DATE FOR RECEIPT OF NEC® NITMAM:  5:00 pm EDST, May 4, 2007 (NEC only)  

If you have questions about filling out or filing the NEC® NITMAM, please contact the Codes and Standards Administration at 617-984-7249  

For further information on the Codes- and Standards-Making Process, see the NFPA website (www.nfpa.org)  

[FORM FOR OFFICE USE ONLY]  
Log #:_________________  
Date Rec'd:___________  

Date________________Name_________________________________Tel. No._________________  
Company or Affiliation________________________Email Address_________________________  
Street Address________________________City________________________State______Zip_________________  

1. (a) NFPA Document (include Number and Title)___________________________________________  
(b) Proposal or Comment Number________________________________________________________  
(c) Section/Paragraph ________________________________________________________________  

2. Motion to be made. Please check one: (See also 4.6 of the Regulations Governing Committee Projects)  
   (a) Proposal  
   (1) (2) (3) (4)  
   (b) Comment  
   (1) (2) (3) (4)  
   (c) Return Technical Committee Report for Further Study  
   (1) (2) (3)  
* Clearly identify the Identifiable Part(s) indicated above (use separate sheet if required).  

3. I am entitled to make this motion in accordance with 4.6.8 of the Regulations Governing Committee Projects, as follows: [check (a), (b), or (c)]:  
   (a) This motion may be made by the original submitter or their designated representative, and I am the [if you check (a) indicate one of the following]:  
      (1) I am the Original submitter, or  
      (2) I am the submitter's designated representative (attach written authorization signed by the original submitter), or  
      (3) I am an Organization Member Delegate permitted to represent the submitter on behalf of the Organization Member in accordance with 4.6.8.2.  
   (b) This motion may be made by a Technical Committee Member and I am a Member of the responsible Technical Committee.  
   (c) This motion may be made by anyone.  

(Form continued on next page)
NEC® NITMAM form (continued)

4. Comments or Clarification (optional): This NEC® NITMAM will be reviewed by a Motions Committee. In addition to determining whether your Amending Motion is proper, the Panel may take other actions as described in 2.3 of the Technical Meeting Convention Rules as follows:

Restating and Grouping of Motions. Upon request or on its own initiative, and in consultation with the mover(s), the Motions Committee may: (a) restate an Amending Motion to facilitate the making of a proper motion or to clarify the intent of the mover; and (b) group Amending Motions that are dependent on one another into a single Amending Motion. Dependent motions are motions that the mover(s) wish to be considered by the assembly and voted on as single up or down package. In addition to the foregoing, the Motions Committee may take such other actions or make such other recommendations as will facilitate the fair and efficient consideration of motions within the available time.

The NFPA Staff may contact you to clarify your motion or to consult on the permitted actions in 2.3. If you have any comments, suggestions, or requests of the Motions Committee as it reviews your NITMAM and considers actions permitted in 2.3, please provide them below. (Use additional sheet if necessary):

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Name (please print):_____________________________________________________________________

Signature (required):_____________________________________________________________________

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XXX
Information on NFPA Codes and Standards Development

I. Applicable Regulations. The primary rules governing the processing of NFPA documents (codes, standards, recommended practices, and guides) are the NFPA Regulations Governing Committee Projects (RGCPs). Other applicable rules include NFPA Bylaws, NFPA Technical Meeting Convention Rules, NFPA Guide for the Conduct of Participants in the NFPA Standards Development Process, and the NFPA Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council. These rules and regulations are contained in the NFPA Directory. For copies of the Directory, contact Codes and Standards Administration at NFPA Headquarters; these documents are also available on the NFPA website at “www.nfpa.org.”

The following is general information on the NFPA process. All participants, however, should refer to the actual rules and regulations for a full understanding of this process and for the criteria that govern participation.

II. Technical Committee Report (TCR). The Technical Committee Report is defined as “the Report of the Technical Committee and Technical Correlating Committee (if any) consisting of the Report on Proposals (ROP), as modified by the Report on Comments (ROC), published by the Association” (see 1.4 of RGCPs).

III. Step 1: Report on Proposals (ROP). The ROP is defined as “a report to the Association on the actions taken by Technical Committees and/or Technical Correlating Committees, accompanied by a ballot statement and one or more proposals on text for a new Document or to amend an existing Document” (see 1.4 of RGCPs). Any objection to an action in the ROP must be raised through the filing of an appropriate Comment for consideration in the ROC or the objection will be considered resolved.

IV. Step 2: Report on Comments (ROC). The ROC is defined as “a report to the Association on the actions taken by Technical Committees and/or Technical Correlating Committees accompanied by a ballot statement and one or more comments resulting from public review of the Report on Proposals (ROP) (see 1.4 of RGCPs). The ROP and the ROC together constitute the Technical Committee Report. Any outstanding objection following the ROC must be raised through an appropriate Amending Motion at the Association Technical Meeting or the objection will be considered resolved.

V. Step 3a: Action at Association Technical Meeting. Following the publication of the ROC, there is a period during which those wishing to make proper Amending Motions on the Technical Committee Reports must signal their intention by submitting a Notice of Intent to Make a Motion. Documents that receive notice of proper Amending Motions (Certified Amending Motions) will be presented for action at the annual June Association Technical Meeting. At the meeting, the NFPA membership can consider and act on these Certified Amending Motions as well as Follow-up Amending Motions, that is, motions that become necessary as a result of a previous successful Amending Motion. (See 4.6.2 through 4.6.9 of RGCPs for a summary of the available Amending Motions and who may make them.) Any outstanding objection following action at an Association Technical Meeting (and any further Technical Committee consideration following successful Amending Motions, see RGCPs at 4.7) must be raised through an appeal to the Standards Council or it will be considered to be resolved.

VI. Step 3b: Documents Forwarded Directly to the Council. Where no Notice of Intent to Make a Motion is received and certified in accordance with the Technical Meeting Convention Rules, the document is forwarded directly to the Standards Council for action on issuance. Objections are deemed to be resolved for these Documents.

VII. Step 4a: Council Appeals. Anyone can appeal to the Standards Council concerning procedural or substantive matters related to the development, content, or issuance of any Document of the Association or on matters within the purview of the authority of the Council, as established by the Bylaws and as determined by the Board of Directors. Such appeals must be in written form and filed with the Secretary of the Standards Council (see 1.6 of RGCPs). Time constraints for filing an appeal must be in accordance with 1.6.2 of the RGCPs. Objections are deemed to be resolved if not pursued at this level.

VIII. Step 4b: Document Issuance. The Standards Council is the issuer of all Documents (see Article 8 of Bylaws). The Council acts on the issuance of a Document presented for action at an Association Technical Meeting within sixty days from the date of the recommendation from the Association Technical Meeting, unless this period is extended by the Council (see 4.8 of RGCPs). For Documents forwarded directly to the Standards Council, the Council acts on the issuance of the Document at its next scheduled meeting, or at such other meeting as the Council may determine (see 4.5.7 and 4.8 of RGCPs).

IX. Petitions to the Board of Directors. The Standards Council has been delegated the responsibility for the administration of the codes and standards development process and the issuance of Documents. However, where extraordinary circumstances requiring the intervention of the Board of Directors exist, the Board of Directors may take any action necessary to fulfill its obligations to preserve the integrity of the codes and standards development process and to protect the interests of the Association. The rules for petitioning the Board of Directors can be found in the Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council and in 1.7 of the RGCPs.

X. For More Information. The program for the Association Technical Meeting (as well as the NFPA website as information becomes available) should be consulted for the date on which each report scheduled for consideration at the meeting will be presented. For copies of the ROP and ROC as well as more information on NFPA rules and for up-to-date information on schedules and deadlines for processing NFPA Documents, check the NFPA website (www.nfpa.org) or contact NFPA Codes & Standards Administration at [617-984-7246].
Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1  Call for Proposals
▼ Proposed new document or new edition of an existing document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2  Report on Proposals (ROP)
▼ Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.
▼ Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
▼ Report on Proposals (ROP) is published for public review and comment.

Step 3  Report on Comments (ROC)
▼ Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.
▼ Committee votes by written ballot on Comments. If two-thirds approve, Reports goes forward. Lacking two-thirds approval, Report returns to Committee.
▼ Report on Comments (ROC) is published for public review.

Step 4  Technical Committee Report Session
▼ “Notices of intent to make a motion” are filed, are reviewed, and valid motions are certified for presentation at the Technical Committee Report Session. (“Consent Documents” that have no certified motions bypass the Technical Committee Report Session and proceed to the Standards Council for issuance.)
▼ NFPA membership meets each June at the Annual Meeting Technical Committee Report Session and acts on Technical Committee Reports (ROP and ROC) for documents with “certified amending motions.”
▼ Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

Step 5  Standards Council Issuance
▼ Notification of intent to file an appeal to the Standards Council on Association action must be filed within 20 days of the NFPA Annual Membership Meeting.
▼ Standards Council decides, based on all evidence, whether or not to issue document or to take other action, including hearing any appeals.
The Technical Committee Report Session of the NFPA Annual Meeting

The process of public input and review does not end with the publication of the ROP and ROC. Following the completion of the Proposal and Comment periods, there is yet a further opportunity for debate and discussion through the Technical Committee Report Sessions that take place at the NFPA Annual Meeting.

The Technical Committee Report Session provides an opportunity for the final Technical Committee Report (i.e., the ROP and ROC) on each proposed new or revised code or standard to be presented to the NFPA membership for the debate and consideration of motions to amend the Report. The specific rules for the types of motions that can be made and who can make them are set forth in NFPA’s rules, which should always be consulted by those wishing to bring an issue before the membership at a Technical Committee Report Session. The following presents some of the main features of how a Report is handled.

What Amending Motions Are Allowed. The Technical Committee Reports contain many Proposals and Comments that the Technical Committee has rejected or revised in whole or in part. Actions of the Technical Committee published in the ROP may also eventually be rejected or revised by the Technical Committee during the development of its ROC. The motions allowed by NFPA rules provide the opportunity to propose amendments to the text of a proposed code or standard based on these published Proposals, Comments, and Committee actions. Thus, the list of allowable motions include motions to accept Proposals and Comments in whole or in part as submitted or as modified by a Technical Committee action. Motions are also available to reject an accepted Comment in whole or part. In addition, Motions can be made to return an entire Technical Committee Report or a portion of the Report to the Technical Committee for further study.

The NFPA Annual Meeting, also known as the NFPA World Safety Conference & Exposition®, takes place in June of each year. A second Fall membership meeting was discontinued in 2004, so the NFPA Technical Committee Report Session now runs once each year at the Annual Meeting in June.

Who Can Make Amending Motions. NFPA rules also define those authorized to make amending motions. In many cases, the maker of the motion is limited by NFPA rules to the original submitter of the Proposal or Comment or his or her duly authorized representative. In other cases, such as a Motion to Reject an accepted Comment, or to Return a Technical Committee Report or a portion of a Technical Committee Report for Further Study, anyone can make these motions. For a complete explanation, NFPA rules should be consulted.

The Filing of a Notice of Intent to Make a Motion. Before making an allowable motion at a Technical Report Session, the intended maker of the motion must file, in advance of the session, and within the published deadline, a Notice of Intent to Make a Motion. A Motions Committee appointed by the Standards Council then reviews all notices and certifies all amending motions that are proper. The Motions Committee can also, in consultation with the makers of the motions, clarify the intent of the motions and, in certain circumstances, combine motions that are dependent on each other together so that they can be made in one single motion. A Motions Committee report is then made available in advance of the meeting listing all certified motions. Only these Certified Amending Motions, together with certain allowable Follow-Up Motions (that is, motions that have become necessary as a result of previous successful amending motions) will be allowed at the Technical Committee Report Session.

Consent Documents. Often there are codes and standards up for consideration by the membership that will be noncontroversial and no proper Notices of Intent to Make a Motion will be filed. These “Consent Documents” will bypass the Technical Committee Report Session and head straight to the Standards Council for issuance. The remaining Documents are then forwarded to the Technical Committee Report Session for consideration of the NFPA membership.

Important Note: The filing of a Notice of Intent to Make a Motion is a new requirement that took effect beginning with the Fall 2005 revision cycle. For the most up-to-date information on the codes and standards process, see the Rules and Regulations on the NFPA website at www.nfpa.org.
Action on Motions at the Technical Committee Report Session. In order to actually make a Certified Amending Motion at the Technical Committee Report Session, the maker of the motion must sign in at least an hour before the session begins. In this way a final list of motions can be set in advance of the session. At the session, each proposed document up for consideration is presented by a motion to adopt the Technical Committee Report on the document. Following each such motion, the presiding officer in charge of the session opens the floor to motions on the document from the final list of Certified Amending Motions followed by any permissible Follow-Up Motions. Debate and voting on each motion proceeds in accordance with NFPA rules. NFPA membership is not required in order to make or speak to a motion, but voting is limited to NFPA members who have joined at least 180 days prior to the session and have registered for the meeting. At the close of debate on each motion, voting takes place, and the motion requires a majority vote to carry. In order to amend a Technical Committee Report, successful amending motions must be confirmed by the responsible Technical Committee, which conducts a written ballot on all successful amending motions following the meeting and prior to the Document being forwarded to the Standards Council for issuance.

Standards Council Issuance

One of the primary responsibilities of the NFPA Standards Council, as the overseer of the NFPA codes and standards development process, is to act as the official issuer of all NFPA codes and standards. When it convenes to issue NFPA documents, it also hears any appeals related to the document. Appeals are an important part of assuring that all NFPA rules have been followed and that due process and fairness have been upheld throughout the codes and standards development process. The Council considers appeals both in writing and through the conduct of hearings at which all interested parties can participate. It decides appeals based on the entire record of the process as well as all submissions on the appeal. After deciding all appeals related to a document before it, the Council, if appropriate, proceeds to issue the document as an official NFPA code or standard. Subject only to limited review by the NFPA Board of Directors, the decision of the Standards Council is final, and the new NFPA code or standard becomes effective twenty days after Standards Council issuance.
5-1 Log #990 NEC-P05

(Entire Document) Final Action: Reject

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: 5-1

Recommendation: Mr. Ziessniss had it right; the proposal should be accepted as written.

Substantiation: I have looked at the changes accepted as alternatives to this broader change; they do not correct the misleading implication of various uses of “grounding.” In fact, by redefining “ground” as “earth” - I don’t have a problem with that, if they think the dictionary won’t do the job - the CMP may push many people’s assumption further toward the idea that “equipment grounding” may be established by a local ground reference. The present use of “grounding” is hallowed in tradition. However, if we can suck it up and accept the fact that chapters are moved around and given new numbers, we can accept the use of a more-appropriate term. Also, the “we” who are accustomed to the present usage are aging, and newer users may be more-easily misled. They certainly are less likely to be disconcerted by the new language.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its initial action and position on Proposal 5-1 (Log No. 160) to reject changing the term “equipment grounding conductor” to the term “equipment bonding conductor” throughout the NEC. The work the TCC-assigned task group on grounding and bonding determined through a consensus process that changing the term would not result in an adequate solution for the identified problems in Code-wide grounding and bonding definitions and terminology that resulted from Proposal 5-1 (Log No. 2453e) in the 2004 Committee Report on Proposals. The revisions to the definition of the term “equipment grounding conductor” and the associated fine print notes together with additional Code-wide revisions where the term is used, are consistent with the objectives and responsibilities of the TCC assigned Task Group on Grounding and Bonding. See the panel action and statement on Proposal 5-1 (Log No. 160).

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

ARTICLE 90 — INTRODUCTION

1-1 Log #832 NEC-P01 Final Action: Accept

(90.2(A)(2))

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 1-4

Recommendation: Accept the Proposal.

Substantiation: The submitter is correct. The FPN does add confusion when one considers that the NEC is an enforcement document that is adopted by practically all jurisdictions in the US.

The NEC does indeed contain provisions that are in conflict with the NEC. Should users decide to utilize the NESC for installations covered by the NEC, the conflicts place the AHJ in a very difficult position. Although the NESC may be useful for some engineering design information, to reference as a source from the NESC implies that it is capable of being used without interfering with the use of the NEC. The code loses nothing by deleting the reference, but has increased confusion/conflict with the reference included.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative: ANTHONY, M.: Our interest group is interested in the outcome of Proposal 1-4 because many colleges and universities have power plants and utility distribution systems that operate much like utilities.

We believe that the NEC loses a great deal with the deletion of a reference (to the NESC) which has been present for many code cycles. Much of the credibility of the NEC arises from the fact that it is referenced in so many other legal documents and references so many related documents within it. No doubt these references add to the bulk of the NEC but you cannot sustain credibility by not acknowledging the single most important document that governs the installation and operation of equipment at brings electric energy from the power plant to the power outlet. Knowledge of the operating characteristics of construction and operation of equipment at brings electric energy from the power plant to the power outlet. Knowledge of the operating characteristics of upstream equipment, for example, is important for the design and operation of emergency switchinggear within the building premises (coordinating utility reclosers with transfer switches, for example).

Some of the confusion may arise from the similarity in the titles of the NEC and the NESC. Perhaps something should be done about re-naming the NEC. In the intervening time the NEC and the NESC should continue to refer to each other. If, indeed, the NEC is a document to be used by trained persons only, as described in 90.1(C), then that training should ameliorate the confusion.

LABRAKE, JR., N.: This comment and Proposal 1-4 should be rejected and the FPN needs to be retained. The Fine Print Note (FPN) in the scope of the NEC referencing ANSI C2, National Electrical Safety Code (NFESC) provides a desirable correlation with a similar note in the Scope of the NESC explaining that, whereas the NESC covers utility facilities and functions up to the Service Point, the NEC covers utilization wiring requirements beyond the Service Point. It is noted that the definition of “Service Point” is identical in both documents. The two codes interface at the Service Point and it is proper that each code reference the other to avoid confusion. Provisions of the NEC described in the FPN may be considered in the design and installation of electric supply facilities on the load side of the service point where the NEC is silent, or where not in conflict with the provisions of the NEC. It is also noted that in some jurisdictions, the Authority enforcing the NEC also has authority to enforce the provisions of the NESC. In these instances, the FPN is also important to the application to 90.2(C) Special Permission. In addition, refer to my affirmative statement in Comment 1-44a (1-34a; CC1-101), NEC Section 110.7 Title.

1-2 Log #2027 NEC-P01 Final Action: Accept

(90.2(A)(2), FPN 2)

Submitter: Donald Cook, Shelby County Building Inspections

Comment on Proposal No: 1-4

Recommendation: Delete this FPN completely.

Substantiation: The panel statement indicates the FPN provides Code users with an applicable resource that can be adopted by governmental bodies to cover industrial substations or multibuilding complexes. If adoption of two standards is required or needed for governmental bodies to regulate the installations in the panel statement, it seems the NEC should remove those installations from it’s scope and remove the uncertainty of responsibility for these installations. If the NEC continues to claim responsibility for the installations, a complete set of requirements should be established and references to another document in FPN’s should be removed. In the enforcement of the NEC, the NEC references to the NESC cause regular debate and challenge from designers that attempt to use the NEC for pole line distribution on the secondary of the service point. The purpose for this proposal and comment is not to change the requirements that govern the installations, but to clarify which code or standard is responsible for installations on the customer side of the service point. Confusion can not enhance safety. See CMP-1 action on Proposal 1-145.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative: ANTHONY, M.: See my explanation of negative vote on Comment 1-1.

LABRAKE, JR., N.: This comment and Proposal 1-4 should be rejected. Refer to my negative ballot statement on Comment 1-1.

1-3 Log #985 NEC-P01 Final Action: Accept

(90.2(B)(5))

Submitter: James T. Dollard, Jr., IBEW Local 98

Comment on Proposal No: 1-5

Recommendation: This proposal should be Accepted.

Substantiation: The use of the term “or by other agreements” is in essence, a total exemption of the NEC for utilities. The Panel statement by CMP-1 on the action to reject this proposal clearly recognizes that when and where utilities desire to enter into an agreement with an owner, municipality, school district or other party, the NEC no longer applies, the NESC becomes the installation standard of choice. Additionally, now that the utility is doing the installations, no permit is required, no license is required and no inspection is necessary. Inspectors are no longer needed. Product standards are no longer necessary. No equipment grounding conductors and no overcurrent protection will be installed.

The panel statement reads as follows: “The text “or by other agreements” allows for the installation of utility facilities directed by their regulatory commissions on other than easements or right of ways through applications executed for service to the premise. These facilities include private area lighting, the safety of which is covered through utility conformance with the requirements of the authorities having jurisdiction over the utility.”

Note that the statement clearly recognizes “private area lighting” but does not limit in any way the scope of work permitted to ignore the NEC. This statement also recognizes that such installations are “safe” through utility conformance with the requirements of the authorities having jurisdiction over the utility. There is no AHJ for the utility. If the utility company chooses to do “private area lighting,” or any other work for private consumption, they should be licensed, obtain a permit, be required to meet the minimum requirements of the NEC, and have the installation inspected.

CMP-1 however, in this 2008 ROP stage has gone on record, with a clear statement to allow the utilities to ignore the safety driven provisions of the NEC, product standards and the inspection process. It is interesting to note that the scope of the NESC is limited to the “service point.” The NESC does not apply downstream of the service point. CMP-1 has
given permission to the utilities to ignore the NEC and the scope of the NESC ends at the service point. No code or standard applies when the utility enters into "other agreements." This situation is further complicated by the utility interpretation of the term "service point." The utility interpretation of "service point" is as follows:
(1) The service point is a "moving target" subject to each individual installation.
(2) If the serving utility brings only a service drop to a building, the "service point" is outside of the structure at the point the service drop conductors meet the structure anyway. No fact found evidence has been presented that the existence of a recorded easement has any bearing on the safety of the installation. No technical justification has been presented for a requirement that a utility installation on private property, made solely for the supply of service to that property, needs to be covered by the NEC. An easement for utility facilities on private property assures the utility can meet its obligation to supply all of its customers served through those facilities. No such assurance is generally needed from a property owner for facilities installed on and serving only that property.

The agreements referred to are either designated by or recognized by public service commissions, utility commissions or other regulatory agencies having jurisdiction for such installations. Such agreements are necessary in order for a utility to provide service to a location that does not have a specific easement.

There is no "exemption" for utilities contained in the NEC. 90.2(A)(4) describes those utility installations that are covered and 90.2(B)(5) describes those utility installations that are not covered. Utility installations described in 90.2(B)(5) and not under their exclusive control are covered by the NEC regardless of whether they are a part of a premises wiring system or not. Utility installations under their exclusive control and on the supply side of the service point are under the jurisdiction of their regulatory authorities, typically Public Service Commissions, who are the AHJ's and prescribe the appropriate safety standards, generally ANSI C2, National Electrical Safety Code (NESC). The Scope of the NESC clearly states that it covers utility facilities and functions up to the Service Point and not the service drop conductors. And regarding the statement as to "utility interpretation" in the Proposal -5, the Panel is on record as stating that "no evidence was submitted that installations performed by utilities in accordance with the NES are unsafe." This statement continues to be true.

2. The term "Service Point" is clearly defined and correlated in both the NEC and NESC and is not subject to "utility interpretation." For example, the service point could be on the supply side of a transformer whose installation must conform to the requirements of the NEC, or it could be on the secondary side of the transformer whose installation must be under the exclusive control of the utility and conform to the requirements of the NESC as well as being subject to the location provisions of 90.2(B)(5)(b). The service point cannot be located such that utilization wiring outside the scope of the NESC would exist on its supply side.

The solution offered by the utilities is a simple one, broaden the scope of the NESC beyond the Service Point. Therefore any "other agreements" would preclude the installations of utilization wiring on the load side of the service point not in conformance with the NEC.

2. The NEC covers area lighting of utilities on the supply side of the service point of a premises wiring system. In response to each of 57 comments recorded on pages 12 to 37 of the 1998 NEC Committee Report on Comments, the Panel is on record as stating that "no evidence was submitted that installations performed by utilities in accordance with the NES are unsafe." This statement continues to be true.

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3. The term "Service Point" is clearly defined and correlated in both the NEC and NESC and is not subject to "utility interpretation." For example, the service point could be on the supply side of a transformer whose installation must conform to the requirements of the NEC, or it could be on the secondary side of the transformer whose installation must be under the exclusive control of the utility and conform to the requirements of the NESC as well as being subject to the location provisions of 90.2(B)(5)(b). The service point cannot be located such that utilization wiring outside the scope of the NESC would exist on its supply side.

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The solution offered by the utilities is a simple one, broaden the scope of the NESC beyond the Service Point. Therefore any "other agreements" would preclude the installations of utilization wiring on the load side of the service point not in conformance with the NEC.
Panel Meeting Action: Reject
Panel Statement: The panel concludes that the term “other agreements” is vague and should be eliminated. See Panel Action on Comment 1-3. The panel does not necessarily agree with all of the commenter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
LABRAKE, JR., N.: This comment and Proposal 1-5 should be rejected. Refer to my negative ballot statement on Comment 1-3.

I-5 Log #1046 NEC-P01 Final Action: Accept in Part (90.2(B)(5)(b))
Submitter: Gilbert L. Thompson, MEIA Codes and Standards
Comment on Proposal No: 1-5
Recommendation: The Panel should reconsider their action and accept, not reject, this proposal.

After removing the words “or by other agreements” from Part (b) (our inspectors feel that Section 90.2(B)(5) should be rearranged so that the wording in Part c comes first in the listing of things not covered rather than last.

The inspectors associations wholeheartedly agrees with Mr. Robinson’s substantiation and the negative comments expressed by Mr. Hickman and Mr. Hittenger that the proposal should be accepted.

Substantiation: The affirmative comment by Mr. LaBrake is not valid, really, as electrical ordinances or laws of AHJ always exempt electric utilities when they provide the “service or state point” to an installation of a building or properties because they are regulated by the National Electrical Safety Code. The expansion of the scope of work by electric utilities in providing installations on public and private premises without complying with NEC rules and then circumventing the permit and inspection process by “having some agreement” is in direct conflict with Section 90.2(A)(1)(2). Electric utilities have enough work, control, responsibility and accountability in providing the generation, transmission, distribution and maintenance of wiring on the “service” part of any installation. If they want to expand in other areas, then they should do like everyone else does by complying with local laws and the NEC.

Panel Meeting Action: Accept in Part
The panel accepts only the first sentence of the commentors recommendation which results in removing the words “or by other agreements either” and rejects the second and third sentences of the commentors recommendation.

Panel Statement: The panel concludes that the commentor’s recommendation in sentence 2 does not add clarity and that the existing order is correct. Sentence 3 in the recommendation contains no recommended action. The panel does not necessarily agree with all of the commentor’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:
ANTHONY, M.: See my explanation of negative vote on Comment 1-3. LABRAKE, JR., N.: This comment and Proposal 1-5 should be rejected. Refer to my negative ballot statement on Comment 1-3.

MCCARVER, R.: Please see my Explanation of Negative Vote on Comment 1-3.

I-6 Log #1667 NEC-P01 Final Action: Accept in Principle (90.2(B)(5)(b))
Submitter: Philip Denault, Bear Electric
Comment on Proposal No: 1-5
Recommendation: Revise as follows:

- Are located in legally established easements, rights-of-way, or by other agreements either designated by or recognized by the public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations.

Substantiation: The words chosen, other agreements, is not specific and may create a lot of gray areas. Removing these words can prevent future issues by utilities interpreting them the way they see fit. It is important to stay code compliant anywhere electricity is in use. Seeing how some of these other agreements are taking place on private property, the owner or other persons may get injured or worse thinking it’s ok to service equipment on this type of property. Having a guideline permits, and inspections will prevent liability problems.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 1-3. The panel does not necessarily agree with all of the commentor’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
ANTHONY, M.: See my explanation of negative vote on Comment 1-3. LABRAKE, JR., N.: This comment and Proposal 1-5 should be rejected. Refer to my negative ballot statement on Comment 1-3.

I-7 Log #991 NEC-P01 Final Action: Reject (90.2(D)(and) (E) (New))
Submitter: David Shapiro, Accurate & Intriguing Writing & Editing
Comment on Proposal No: 1-2
Recommendation: Revise text to read as follows:

...Additions, alterations, installations, or repairs shall not cause an existing building to become unsafe or adversely affect the performance of the building, as determined by the authority having jurisdiction. When electrical wiring is added to an existing service, feeder, or branch circuit, the addition shall not result in an installation that shall not violate the provisions of the code in force at the time the additions are made.

Substantiation: The NEC addresses grandfathering rarely, but does address it. This leaves contractors and inspectors up in the air. It will be a far greater service to include some kind of mandatory language on grandfathering, which jurisdictions can remove if they choose, than to leave it up to them to add something. This way it gets refined through the international Code process. My proposed modifications correct grammar or clarify language.

Panel Meeting Action: Reject
Panel Statement: It is unclear as to what the submitter is recommending for revision as Proposal 1-2 was rejected by CMP-1. The proposed text does not provide substantiation or justification to change CMP-1’s position on retroactive application of the NEC. Further, CMP-1 does not agree that the revised text corrects grammar or clarifies language.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-8 Log #448 NEC-P01 Final Action: Accept (90.3)
Comment on Proposal No: 1-7
Recommendation: Continue to reject this proposal.

Substantiation: Code-Making Panel 16, in developing requirements for optical fiber and communications systems, takes into account applicable requirements in other areas of the NEC, and specifically references them where appropriate. An example is the grounding requirements of Article 250 (Chapter 5) that have been referenced over many Code cycles, and are now excepted, as applicable, in Article 770. Requiring that Chapter 8 be “... subject to the requirements of Chapters 1 through 7 unless the requirements are specifically excluded in Chapter 8”, will require a tremendous, unnecessary reworking of the NEC.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-9 Log #6664 NEC-P01 Final Action: Reject (90.3)
Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 1-7
Recommendation: The proposal should be Accepted in Principle by editorially modifying 90.3 to read as shown in the panel statement:

90.3 Code Arrangement. This Code is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally. Chapters 5, 6, 7, and 8 apply to special occupancies, special equipment, special conditions, or communications systems. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, 7, and 8 for the particular conditions.

Delete the existing second paragraph of 90.3.

The last two paragraphs of 90.3 are unchanged from the 2005 Code. Revise Figure 90.3 as follows:

Under the box containing the text “Chapter 7 - Special Conditions”, add an additional box containing the text “Chapter 8 - Communications Systems” and include this additional box within the parenthesis on the left so the parenthesis includes Chapters 5, 6, 7, and 8.

Delete the box, on the lower left side of the Figure, containing the text “Chapter 8 - Communications Systems”, the parenthesis to the right of the box, and the text “Chapter 8 is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8”.

The remainder of the Figure would be unchanged from the 2005 Code.

Substantiation: I agree with the Panel’s conclusion that the intent of the submitter would be met by this editorial modification.

Panel Statement: The submitter correctly pointed out that when Chapter 8 was initially created (more than 40 years ago), it addressed low voltage wiring normally associated with the telephone communications systems in existence at that time and did not anticipate the phenomenal growth and changes in communications that would develop during the subsequent years. The changes in communications technology have also resulted in the increasing use of power and control cables

70-3
with communications systems. These are exactly the same cables used in
residential, commercial and industrial occupancies and, therefore, should be
subject to the same installation requirements of Chapters 1 through 4 that apply
to other installations unless there is a valid technical reason to supplement or
modify those requirements as stated in Chapter 8.

The rapid expansion of communications systems and the ever-increasing
demands for more power make it imperative that Chapter 8 comply with the
requirements of Chapters 1 through 4 to ensure compliance with the purpose of
the Code as stated in 90.1(A).

Panel Meeting Action: Reject
Panel Statement: CMP-1 rejected Proposal 1-7 as it was incomplete. In
addition, the recommendations in Proposal 1-7 would have a major impact
on other code panels and create potential conflicts with existing code
requirements. Obviously, companion proposals would need to be submitted
to address those potential conflicts. Since Proposal 1-7 was lengthy, CMP-1
editorially modified the submitter’s proposal for clarification purposes, ease in
understanding the intent, and referral to the Technical Correlating Committee.
CMP-1 reiterates to the submitter that Proposal 1-7 was rejected.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-10 Log #993 NEC-P01 Final Action: Reject
(90.4)
Submitter: David Shapiro, Accurate & Intriguing Writing & Editing
Comment on Proposal No: 1-8
Recommendation: Revise text to read as follows:
“...having jurisdiction...
Substantiation: I know of a number of jurisdictions that have decided to
restrict certain uses despite their NRTL Listing. Mr. Stolz’s amendment will not
prevent them from doing so, but will increase the pressure on them to adopt
formal Local Amendments when adding such rules. This is a greatly desirable
outcome from the standpoint of fair enforcement. One minor grammatical
tweak.

Panel Meeting Action: Reject
Panel Statement: The Panel reaffirms its statement on Proposal 1-8. The
commentor has not addressed the issues presented in that statement. Any
suggestion of automatic approval of equipment and materials would usurp the
AHJ’s responsibility and be in direct conflict with the provisions of Section
90.4.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

ARTICLE 100 — DEFINITIONS

16-1 Log #1472 NEC-P16 Final Action: Accept
(100. Abandoned (as applied to cable))
Comment on Proposal No: 16-1
Recommendation: Continue to reject these proposals.
Substantiation: The Society of the Plastics Industry supports the removal of
abandoned cables. One of our member companies is in the business of
removing abandoned cables from buildings.

A single definition of “abandoned cable” is inappropriate to cover audio,
information technology, class 2, class 3, fire alarm, optical fiber,
communications, CATV and network-powered broadband because each of
these cable types has its own installation practices that must be accommodated
in the definition of “abandoned cable” to avoid inappropriate and unnecessary
removal.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

3-1 Log #1435 NEC-P03 Final Action: Accept
(100. Abandoned Cable)
Comment on Proposal No: 3-1
Recommendation: Continue to reject these proposals.
Substantiation: The Society of the Plastics Industry supports the removal of
abandoned cables. One of our member companies is in the business of
removing abandoned cables from buildings.

A single definition of “abandoned cable” is inappropriate to cover audio,
information technology, class 2, class 3, fire alarm, optical fiber,
communications, CATV and network-powered broadband because each of
these cable types has its own installation practices that must be accommodated
in the definition of “abandoned cable” to avoid inappropriate and unnecessary
removal.

Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

I-11 Log #319 NEC-P01 Final Action: Accept
(100. Bedroom)
Submitter: Code-Making Panel 2,
Comment on Proposal No: 1-17
Recommendation: Reject the proposal.
Substantiation: The definition proposed by the submitter is unenforceable.
The NEC Style Manual, in 3.3.4, requires that words and terms used in the
NEC shall be specific and clear in meaning. The wording “which are, or could
be used” is too vague.

This comment was balloted through CMP-2 with the following results:
12 Eligible to Vote
11 Affirmative
1 Not Returned (B. Neminger)
Mr. J. Pauley voted affirmatively stating: “For clarity, item 3 of the comment
form should have the “deleted text” box checked and should state “CMP-2
recommends that CMP-1 reject the proposal.”

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:
ANTHONY, M.: Our interest group has an interest in this proposal because of
its implications for the design of student housing. An imperfect definition
now would be better than an perfect one later.

I do not agree that with CMP’s conclusion that this language is a violation
of the clarity rules of the NEC Manual of Style in the use of the term “or
could be” any more than “likely to be serviced” is clear in the flash protection
requirements. Ultimately, the submitter is trying to stop installers or
designers from avoiding the AFCI rules by changing the name or nature of the room.
(See my Comment on the Affirmative on Proposal -- Log 3411).

As the writers of the Life Safety Code have long recognized, sleeping/
bedroom units are places where people stay for 1/3 of their lives while
unconscious. Writers of the NEC need to define bedroom now because it is a
key criterion in the application of AFCI protection. In future code cycles we
should work harder to correlate language of the NEC with the terms sleeping
areas as used in the Life Safety Code.

I-12 Log #994 NEC-P01 Final Action: Reject
(100. Bedroom)
Submitter: David Shapiro, Accurate & Intriguing Writing & Editing
Comment on Proposal No: 1-17
Recommendation: Revise the definition to read as follows:
Bedroom. An area separated by walls or partitions from other similar parts
of the structure or building which are, or could be, that is being used, or whose
design or layout lends itself to being used, primarily for sleeping.

Substantiation: It is indeed worth our while to clarify this issue, to enhance
safety. However, in some apartments, and even houses, the presence of walls
or partitions is not key. Furthermore, “could be” was too broad a characterization. A grammatical quibble: it is preferable to have agreement
or partitions is not key. Furthermore, “could be” any more than “likely to be serviced” is clear in the flash protection
requirements. Ultimately, the submitter is trying to stop installers or designers
from avoiding the AFCI rules by changing the name or nature of the room.
(See my Comment on the Affirmative on Proposal -- Log 3411).

As the writers of the Life Safety Code have long recognized, sleeping/
bedroom units are places where people stay for 1/3 of their lives while
unconscious. Writers of the NEC need to define bedroom now because it is a
key criterion in the application of AFCI protection. In future code cycles we
should work harder to correlate language of the NEC with the terms sleeping
areas as used in the Life Safety Code.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Abstain: 1

Explanation of Abstention:
KIMBLIN, C.: The accepted definition remains confusing. In particular, the definition where the wording of the term, “branch circuit,” and the definition, Comment on Proposal No: _______________________________________________________________(100. Branch Circuit Overcurrent Device)

0-a Log #995 NEC-P01

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)

Comment on Proposal No: 10-1a

Recommendation: The panel should reconsider the action taken on this proposal and Reject the Proposal.

Substantiation: The proposed definition of a Branch-Circuit Overcurrent Device establishes unnecessary confusion. Instead of focusing on branch circuit protection the definition also deals with service and feeder protection. In addition to being confusing, the proposed definition is also incorrect. For example, Branch-Circuit Overcurrent Devices may not provide protection of service equipment over the full range of overcurrent devices described in the NEC definition of overload: overload, short circuit, or ground fault. Thus, at 1000 amperes or more, service equipment protection involves the additional feature of ground fault protection (240.13). Does this definition, with its reference to service equipment, require ground fault protection for all overcurrent devices of 1000 amperes or more? The new definition also states that the Branch-Circuit Overcurrent Device will protect “equipment”. However, a review of the equipment definition in Article 100 shows that equipment includes such items as appliances. But, the Branch-Circuit Overcurrent Device is neither evaluated for, or intended for, appliance protection. That can be the role of supplementary overcurrent protective devices. The proposed definition raises additional questions. Does a listed self-protected combination motor controller fit within this definition? These devices are evaluated for branch circuit protection in a motor circuit. Does this definition give credence to using such devices in areas other than a motor circuit? Is the self-protected combination motor controller suitable for use with feeders or service conductors? That application was never intended as it is specific to Article 430. However, a listed self-protected combination motor controller fits the proposed definition.

Panel Meeting Action: Reject

Panel Statement: The submitted substantiation does not address the panel statement from the proposal. The panel statement was clear that the configuration or arrangement of the equipment could be used to limit the load to a single utilization equipment.

The submitter presumes that all installations will be for equipment that has a current rating that is equal to the receptacle rating. That is not always the case. For example, a refrigerator could be supplied from a duplex receptacle and be within the appropriate ratings and still be a single utilization equipment, provided the arrangement of the receptacle is such that it will limit the application to only the refrigerator.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

10-1 Log #1416 NEC-P10 Final Action: Reject (100. Branch Circuit Overcurrent Device)

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: 10-1a

Recommendation: I agree with Mr. Clive Kimblin that this definition is unnecessary.

Substantiation: I would rather look in the White Book for definitions and applications of equipment. I also consider it quite unfortunate to create a new definition where the wording of the term, “branch circuit,” and the definition, being more inclusive, clash.

Affirmative:  Negative: 1

Explanation of Negative: KIMBLIN, C.: The accepted action for the reason expressed with Comment 10-1.

1-13 Log #3 NEC-P01 (100. Bundled) Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Proposal on Proposal No: 1-19

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the TCC’s recommendation directing further consideration of the comments expressed in the ROP voting. Comments 1-16 from CMP-6, 1-17 from CMP-7, and 1-14 from CMP-12 accept the term moved to Article 100, but CMP-15 in Comment 1-15 rejects the move since the term is unique in Article 520.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

1-14 Log #288 NEC-P01 (100. Bundled) Final Action: Reject


Proposal on Proposal No: 1-19

Recommendation: Code-Making Panel 12 agrees that the definition for “Bundled” in Article 520 is applicable to 640.8 and that the definition can be moved to Article 100.

Substantiation: The term is used in 310.15(B)(2), 334.80, 520.53(M)(2), 520.53(M)(3), 520.53(M)(4), and 640.8, and according to the NEC Style Manual Article 100 should contain definitions of terms used in two or more articles of the NEC.

This comment was balloted through CMP-12 with the following ballot results:
15 Eligible to Vote
11 Affirmative
3 Negative
Substantiated (D. Quave)
Mr. K. Givens voted negatively stating: “The Aluminum Association agrees with the Explanations of Negative Vote provided by Messrs. N. LaBrake and J. Minick on Proposal 1-19.”

Mr. R. Jones voted negatively stating: “The definition of “bundled” in 520.2 is specific to Article 520. If that definition is moved to Article 100 then the requirement of 310.15(B)(2) could not be enforced unless the cables where physically tied together. For instance, several nonmetallic-sheathed cables (romex) could be installed horizontally through framing members and not be physically bound together. The framing members would provide the required support, provided they are less than 54 in. apart, and cable ties would not be required. The bundled cables would be more than 24 in. in length but since they are not physically bound together the requirement for derating would not apply.

Section 310.15(B)(2) also uses the term “stacked” however that term might be difficult to enforce using a general English language dictionary definition.”

Mr. K. White voted negatively stating: “This proposal should be Rejected. There is not a clear understanding of what definition will be in Article 100, as what was proposed in 520.2 is not satisfactory and adding “during installations” does not clarify the definition.”

Panel Meeting Action: Reject

Panel Statement: The Panel concludes from CMP-15’s substantiation and the Panel action on Comment 1-15 that Proposal 1-19 is rejected, since the term “bundled” as used in Articles 520 and 640 is specific.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCMHAHILL, L.: For consistency and ease in understanding code requirements, CMP-1 should have accepted a standard definition for the term “bundled.” There is no logical reason for the term “Bundled” to be unique in various code articles. A standard definition should suffice throughout the NEC and can be modified with the use of adverbs as necessary. It should be noted that CMP’s, 6, 7 and 12 support placing the definition of “Bundled” in Article 100.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCMHAHILL, L.: For consistency and ease in understanding code requirements, CMP-1 should have accepted a standard definition for the term “bundled.” There is no logical reason for the term “Bundled” to be unique in various code articles. A standard definition should suffice throughout the NEC and can be modified with the use of adverbs as necessary. It should be noted that CMP’s, 6, 7 and 12 support placing the definition of “Bundled” in Article 100.
This comment was balloted through CMP-6 with the following ballot results:

5 Negative
5 Not Returned (T. Dunn, D. Marshall, H. Nash, B. Shelly, and M. Skinner)

The definition of “bundled” in 520.2 is very explicit in that it specifies “cables or conductors that are physically tied, wrapped, taped, or otherwise periodically bound together.”

The term “bundled” as used by CMP-6 in 310.15(B)(2)(a), and Exception No. 5(3), including the last paragraph, does not require that the cables or conductors be physically bound together and the installation would not comply with the definition in 502.2 and, therefore, Table 310.15(B)(2)(a) would not apply; this is not the intent of CMP-6.

The term “bundled” as used by CMP-6 applies to conductors or cables in close proximity “without maintaining spacing and are not installed in raceways,” such as through holes in framing materials. There is no requirement for them to be “physically bound together.” It was not the intent of CMP-6 that “bundling” required that the conductors or cables be “physically bound together.” The definition of “Bundled” should remain in 502.2 since it appears to specifically convey the intent of CMP-15 as used in Article 502.”

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 1-14.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: MCMAHILL, L.: See my explanation of negative vote on Comment 1-14.

The definition of “Bundled” in 520.2 is very explicit in that it specifies “cables or conductors that are physically tied, wrapped, taped, or otherwise periodically bound together.”

The term “bundled” as used by CMP-6 in 310.15(B)(2)(a), and Exception No. 5(3), including the last paragraph, does not require that the cables or conductors be physically bound together and the installation would not comply with the definition in 502.2 and, therefore, Table 310.15(B)(2)(a) would not apply; this is not the intent of CMP-6.

The term “bundled” as used by CMP-6 applies to conductors or cables in close proximity “without maintaining spacing and are not installed in raceways,” such as through holes in framing materials. There is no requirement for them to be “physically bound together.” It was not the intent of CMP-6 that “bundling” required that the conductors or cables be “physically bound together.” The definition of “Bundled” should remain in 502.2 since it appears to specifically convey the intent of CMP-15 as used in Article 502.”

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 1-14.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: MCMAHILL, L.: See my explanation of negative vote on Comment 1-14.
The use of the term "bundled" as used by CMP 6 and CMP 7 does not define the exact installation conditions where 30.5(B)(2)(a) applies or does not require that the cables or conductors be physically bound together. This is clearly not within the definition of "bundled" as defined in 520.2.

Substantiation: The Submitter's proposal includes bundling that does not have a "physical" means of bounding the cables or conductors such as multiple cables passed through a single hole or notch in a framing member.

Panel Meeting Action: Accept

Panel Statement: See my explanation of negative vote on Comment 1.14.

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCMAHILL, L.: See my explanation of negative vote on Comment 1-14.

I-19 Log #665 NEC-P01

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: I-19

Recommendation: Proposal I-19 should be Rejected.

Substantiation: The definition of "Bundled" in 520.2 is very explicit in that it specifies "Cables or conductors that are physically tied, wrapped, taped, or otherwise periodically bound together."

The use of the term "bundled" as used by CMP 6 and CMP 7 does not require that the cables or conductors be "physically bound together", it applies to conductors or cables where spacing is not maintained.

Therefore, if the 502.2 definition of "bundled" is included in Article 100, Table 310.15(B)(2)(a) would no longer apply since the conductors or cables are not required to be physically bound together and the installation would not comply with the definition proposed for Article 100. Also, 2.2.2 of the NEC Style Manual stipulates that "Definitions shall not contain requirements or recommendations."

The term "bundled" as used by CMP 6 in 310.15(B)(2)(a) applies "...where single conductors or multicore conductors are electrically bound together without maintaining space and are not installed in raceways..." 310.15(B)(2)(a) Exception No. 5(3), including the last paragraph, does not require that the cables or conductors be physically bound together. In the 2005 NEC, the term "bundled" as used by CMP 7 in the second paragraph of 334.80 reads: "...are bundled together and pass through wood framing..." applies to cables in close proximity such as through holes in framing materials. There is no requirement that the cables be "physically bound together."

CMP 7 Accepted in Principle Proposal 7-72 and stated in the panel statement, "The panel agrees that "bundled" is not defined, and the revised wording more accurately describes the installation." This action removed the only instance of "bundled" used in Article 334. The panel action to Accept Proposal 7-74 also resulted in the term "bundled" not being used. The term "bundled" will no longer appear in Article 334.

640.8 Grouping of Conductors, states: "Insulated conductors of different systems grouped or bundled so as to be in close physical contact with each other in the same raceway or other enclosure, or in portable cords or cables, shall comply with 300.3(C)(1)." 300.3(C)(1) stipulates that it only applies where the insulated conductors, rated 600 V or less, are installed in the same raceway or enclosure, or in portable cords or cables, and does not include the requirements of 520.2 that the cables or conductors be "physically tied, wrapped, taped, or otherwise periodically bound together."

Also, Proposal 16-290, which was Rejected, included in the first paragraph of the substantiation, a reference to "...NEC 830 provided guidelines for many aspects of delivering bundled services." Article 830 covers Network-Powered Broadband Connect Systems and the use of "bundled" in this instance is clearly not within the definition of "bundled" as defined in 520.2.

The definition of "bundled" as it appears in 520.2 appears to be specifically applicable to Article 520 and not applicable to 310.15(B)(2) or Articles 334 and 640. Therefore, since the proposed definition specifically applies to only one Article, it should remain in 520.2 and not be included in Article 100.

I agree that there is confusion regarding the use of the term "bundled" as evidenced by the various interpretations that currently exist, but this confusion can easily be resolved by replacing the term "bundled" with text specifically defining the exact installation conditions where 310.15(B)(2)(a) applies or does not apply, such as CMP 7 has done in 334.80.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

I-20 Log #1895 NEC-P01

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: I-19

Recommendation: The proposal should be rejected.

Substantiation: The word must be free to assume subtle differences in meaning as used in different places in the NEC. The most troublesome of the proposed is the physical binding attribute. This is appropriate in Article 520, but not in Article 334, for example, where it is clear that running multiple cables through a single set of holes in succeeding framing members will create the objectionable condition addressed in the rule, even though the cables are not tie-wrapped together.

Panel Meeting Action: Reject

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCMAHILL, L.: For clarity and consistency, definitions should be clear, concise and unambiguous. By accepting the submitter’s comment, CMP-1 superficially supports an NEC term that is "free to assume subtle differences in meaning." This is contrary to the NEC Style Manual Sections 1.1 and 3.3. See my explanation of negative vote on Comment 1-14.

I-21 Log #996 NEC-P01

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: I-20

Recommendation: Revise the definition to read as follows: "Clothes Closet. A small room, chamber, or area used primarily for storage of clothes and not designed for nor, in normal circumstances lending itself to, uses other than storage."

Substantiation: I believe that Mr. Johnston’s new text should be accepted without the CMP’s proposed modification. The manual’s warning against circular definitions is not at issue, and the CMP’s circumlocution adds nothing. However, I’ve seen bedrooms, bathrooms, even stairways that were given over to piles of clothing. His definition technically would include them, and I doubt that is anybody’s intention. It’s far better to say this clearly than to rely on “You know what we mean.” I thought twice about suggesting the phrase, “in normal circumstances,” but scenarios came to mind making it worthwhile. For example, an inspector shows up and finds boxes piled in an area while construction work is being performed in the next room.

Panel Meeting Action: Accept

Panel Statement: The recommendation does not add clarity to the definition as accepted by the Panel on Proposal 1-20.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

I-22 Log #2099 NEC-P01

Submitter: James H. Maxfield, Dover, NH

Comment on Proposal No: I-20

Recommendation: Add: A new habitable room or space intended primarily for storage of garments and apparel.

Substantiation: The definition of clothes closet should be added to Article 100 as revised by CMP 1 because of the facts outlined in the original submitter’s proposal, CMP-1 definition includes the term “non-habitable room” which should assist the industry in classifying these areas, which have an infinite number of design possibilities whether located indoors or out. The addition of this definition will help achieve the minimum standards of NFPA 70.

Panel Meeting Action: Accept in Principle

Panel Statement: CMP-1 concurs with the submitter’s comments and suggestion to accept (add) the revised definition as noted in Panel action in Proposal 1-20. CMP-1 concludes that the submitter meant to use the word “non” as opposed to “new” in the recommended text.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12
Is fished between access points through concealed spaces in finished buildings or structures and supporting is impracticable.

334.30(B)

(B) Unsupported Cables. Nonmetallic-sheathed cable shall be permitted to be unsupported where the cable is fished through concealed spaces in finished buildings or structures and supporting is impracticable.

376.10

376.10 Uses Permitted. The use of metal wireway shall be permitted in the following:

1. For exposed work
2. In concealed spaces as permitted in 376.10(4)

604.4

604.4 Uses Permitted. Manufactured wiring systems shall be permitted in accordance with dry locations and in ducts, plenums, and other air-handling spaces where listed for this application and installed in accordance with 300.22. Exception No. 1: In concealed spaces, one end of tapped cable shall be permitted to extend into hollow walls for direct termination at switch and outlet points.

760.30(A)(1)

760.30 Multiconductor NPLFA Cables. Multiconductor non–power-limited fire alarm cables that meet the requirements of 760.81 shall be permitted to be used on fire alarm circuits operating at 150 volts or less and shall be installed in accordance with 760.30(A) and 760.30(B).

(A) NPLFA Wiring Method. Multiconductor non–power-limited fire alarm circuit cables shall be installed in accordance with 760.30(A)(1), (A)(2), and (A)(3).

1. Exposed or Fished in Concealed Spaces. In raceway or exposed on surface of ceiling and sidewalls or fished in concealed spaces. Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

760.52(B)(1)

(B) PLFA Wiring Methods and Materials. Power-limited fire alarm conductors and cables described in 760.82 shall be installed as detailed in 760.52(B)(1), (B)(2), or (B)(3) of this section. Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

1. Exposed or Fished in Concealed Spaces. In raceway or exposed on the surface of ceiling and sidewalls or fished in concealed spaces. Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

770.154(A) FPN

Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.154(A) through 770.154(E) or where cable substitutions are made as shown in 770.154(F).

(A) Plenums. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type OFNP or OFCP. Abandoned cables shall not be permitted to remain. Types OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Type OFNP and OFCP cables shall be permitted to be installed in these raceways.


800.154(A) FPN

(A) Plenum. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type CMP. Abandoned cables shall not be permitted to remain. Types CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Listed plenum communications wire shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Type CMP cable shall be permitted to be installed in raceways.


820.154(A) FPN
Clearly, the use term “concealed spaces” in Articles 320, 330, 332, 334, 376, and 760.30(A)(1) is fished between access points through concealed spaces where the cable is fished between access points through concealed spaces in finished buildings or structures and supporting is impracticable.


The panel rejected the proposal because of the Standards Council directive to maintain the status quo on issues related to plenum cables. The panel should reconsider its position relative to the applicability of the standards council directive to this proposal. Clearly, the use term “concealed spaces” in Articles 320, 330, 332, 334, 376, and 760 has no relation to plenum cables.

The use of the term “concealed spaces” in the plenum cable applications sections of Articles 800 and 820 is in mandatory fine print notes. Defining the a term in a fine print note does not change plenum cable requirements because the fine print note is for information only; it is not a mandatory requirement.

This definition is an extract from NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. It is the only definition of concealed space in the NFPA Glossary.

The definition of “Concealed” currently in the NEC is: “Concealed. Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them.”

The recommended change to the definition of “Concealed” will clarify that the current definition deals with wiring methods just as one of the definitions of “Accessible” applies to wiring methods. “Accessible (as applied to equipment). Admitting close approach; not guarded by locked doors, elevation, or other effective means.”

Accessible (as applied to wiring methods). Capable of being removed or exposed without damaging the building structure or finish or not permanently closed in by the structure or finish of the building.

Accessible, Readily (Readily Accessible). Capable of being reached quickly for operation, renewal, or inspection without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, and so forth.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its statement on proposal -23.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

1-25 Log #1606 NEC-P01 Final Action: Reject (100. Concealed Space)

Submitter: Allen C. Weidman, Society of the Plastics Industry, Inc.

Comment on Proposal No: 1-23

Reconsideration: Accept this proposal in principle by accepting the proposed definition of concealed space and also modifying the definition of “concealed” as shown below:

Concealed Space. That portion(s) of a building behind walls, over suspended ceilings, in pipe chases, attic, and in whose size might normally range from 44.45 mm (1.75 in.) to 2.44 m (8 ft) intermittent run spaces and that might contain combustible materials such as building structural members, thermal and/or electrical insulation, and ducting. [NFPA 96:3.3.42.11]

Concealed (as applied to wiring methods). Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them.

Substantiation: The proposal cited the following uses of the term concealed space in the NEC:

320.30(D)(1)

(D) Unsupported Cables. Type AC cable shall be permitted to be unsupported where the cable can be accessible by withdrawing it.

1) Is fished between access points through concealed spaces in finished buildings or supporting is impracticable

330.30(D)(1)

(D) Unsupported Cables. Type MC cable shall be permitted to be unsupported where the cable:

1) Is fished between access points through concealed spaces in finished buildings or supporting is impracticable; or

332.30

332.30 Securing and Supporting. Type MI cable shall be supported and secured by staples, straps, hangers, or similar fittings, designed and installed so as not to damage the cable, at intervals not exceeding 1.8 m (6 ft).

(A) Horizontal Runs Through Holes and Notches. In other than vertical runs, cables installed in accordance with 300.4 shall be considered supported and secured where such support does not exceed 1.8 m (6 ft) intervals.

(B) Unsupported Cables. Type MI cable shall be permitted to be unsupported where the cable is fished between access points through concealed spaces in finished buildings or structures and supporting is impracticable.

334.30(B)

(B) Unsupported Cables. Nonmetallic-sheathed cable shall be permitted to be unsupported where the cable:

1) Is fished between access points through concealed spaces in finished buildings or structures and supporting is impracticable.

760.10

760.10 Uses Permitted. The use of metal wireways shall be permitted in the following:

1) For exposed work

2) In concealed spaces as permitted in 376.10(4)(A)

760.30

760.30 Multiconductor NPLFA Cables. Multiconductor non–power–limited fire alarm cables that meet the requirements of 760.81 shall be permitted to be used on fire alarm circuits operating at 150 volts or less and shall be installed in accordance with 760.30(A) and 760.30(B).

(A) NPLFA Wiring Method. Multiconductor non–power–limited fire alarm circuit cables shall be installed in accordance with 760.30(A)(1), (A)(2), and (A)(3).

1) Exposed or Fished in Concealed Spaces. A raceway or exposed on surface of ceiling or walls or fished in concealed spaces. Cables splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, doors, frames, ledges, and so forth.

760.30(B)(1)

(B) PLFA Wiring Methods and Materials. Power–limited fire alarm conductors and cables described in 760.82 shall be installed as detailed in 760.52(B)(1), (B)(2), (B)(3) of this section. Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

1) Exposed or Fished in Concealed Spaces. In raceway or exposed on surface of ceiling or walls or fished in concealed spaces. Cables splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, doors, frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

760.30(B)(1)

(B) PLFA Wiring Methods and Materials. Power–limited fire alarm conductors and cables described in 760.82 shall be installed as detailed in 760.52(B)(1), (B)(2), (B)(3) of this section. Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

1) Exposed or Fished in Concealed Spaces. In raceway or exposed on surface of ceiling or walls or fished in concealed spaces. Cables splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, doors, frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

770.154(A) FPN

(S) Conduit and conductive optical fiber cables shall comply with any of the requirements given in 770.154(A) through 770.154(E) or where cable substitutions are made as shown in 770.154(F).

(A) Plenums. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type OFNP or OFCP. Abandoned cables shall not be permitted to remain. Types OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only type OFNP and OFCP cables shall be permitted to be installed in these raceways.


800.154(A) FPN

(A) Plenum. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type CAFP. Abandoned cables shall not be permitted to remain. Types CMP, CMR, CMG, CM, and CMX and communications wires installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ducts and plenums as described in 300.22 and in other spaces used for environmental air as described in 300.22(C). Only Type CMP cable shall be permitted to be installed in raceways.


820.154(A) FPN
Clearly, the use term “concealed spaces” in Articles 320, 330, 332, 334, 376,
The recommended change to the definition of “Concealed” will clarify that
The use of the term “concealed spaces” in the plenum cable applications
Governing Committee Projects.
Substantiation:
that this proposal be referred to Code-Making Panel 4 for action in Article 225.
Recommendation:
Comment on Proposal No:
Submitter:
_____________________________________________________________
(100. Conductor, open, Cable, open multiconductor)
Ballot Results:
Substantiation:
that this proposal be referred to Code-Making Panel 4 for action in Article 225.
Recommendation:
Comment on Proposal No:
Submitter:
_____________________________________________________________
(100. Conduit Body)
Panel Meeting Action: Accept
Panel Statement: The panel reaffirms its statement on proposal 1-23.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

4-2a Log #CC400 NEC-P04 Final Action: Accept
(100. Conductor, open, Cable, open multiconductor)
Submitter: Code-Making Panel 4,
Comment on Proposal No: 4-1
Recommendation: Reject proposal 6-2
Substantiation: The two proposed definitions are very generic definitions
where a general dictionary definition for “open” can be used without inserting
this definition into Article 100 or into Article 225. There was a concentrated
effort during the 2005 NEC cycle to clarify the differences between “open”
conductors and “exposed” conductors. The usage of “open” in Article 225
is dealing with the general dictionary definition of being open or exposed.
Inserting these definitions into Article 100 or into Article 225 could also be
confusing to the user of the NEC since Article 398 addresses Open Wiring on
Insulators.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-2b Log #CC401 NEC-P04 Final Action: Accept
(100. Conductor, open, Cable, open multiconductor)
Submitter: Code-Making Panel 4,
Comment on Proposal No: 4-2
Recommendation: Reject proposal 6-3
Substantiation: The two proposed definitions are very generic definitions
where a general dictionary definition for “open” can be used without inserting
this definition into Article 100 or into Article 225. There was a concentrated
effort during the 2005 NEC cycle to clarify the differences between “open”
conductors and “exposed” conductors. The usage of “open” in Article 225
is dealing with the general dictionary definition of being open or exposed.
Inserting these definitions into Article 100 or into Article 225 could also be
confusing to the user of the NEC since Article 398 addresses Open Wiring on
Insulators.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

9-1 Log #541 NEC-P09 Final Action: Reject
(100. Conduit Body)
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 9-2
Recommendation: Accept the proposal.
Substantiation: Conduit bodies are not restricted to conduit or tubing systems.
“Proper” use by attachment to a raceway is not mandated by Code. A cord or
cable could enter a properly supported conduit body for purpose of splicing, or
where the conduit body is attached to a cabinet, box, enclosure, or housing of
equipment with a chase nipple (a fitting not conduit or tubing). A conduit body
supporting a floodlight lampholder and connected to a box with a chase nipple
has no conduit or tubing involved.
Panel Meeting Action: Reject
Panel Statement: For the purposes of this definition, a chase nipple is both a
fitting as well as an element of a raceway. The definition of the term raceway
includes, but is “not limited to” various Chapter 3 methods. There is no
evidence that the existing definition is causing confusion in the field.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

2-3 Log #508 NEC-P02 Final Action: Reject
(100. Connected Load (New))
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 2-3
Recommendation: Accept the proposal.
Substantiation: “Calculated” load is well defined by tables, va/sq ft, va per
outlet, demand factors, etc. An unconnected calculated load is not the same as
connected load since one equipment is necessarily connected. 210.11(B) uses
the terms “calculated load” and “connected load” which infers a difference.
Panel Meeting Action: Reject
Panel Statement: As with the original proposal, the submitter has not
presented substantiation that the term “connected load” needs to be specifically
defined. The term is well understood within the context of how it is used.
Number Eligible to Vote: 12
I-26 Log #419 NEC-P01
Final Action: Reject
(100. Connection, Permanent (Direct) Connection, Cord-and-Plug (new))
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 1-26
Recommendation: Accept revised:
Conductors that are connected by means other than attachment plug, receptacle, cord connector body, or motor base inlet, such as lugs, terminals. Wire connectors, clamps, solder, screws, and the like.
Substantiation: A definition for permanently connected is useful and has nothing to do with permanently installed equipment is cord and plug connected, whether portable or fixed. This would also apply to equipment permitted to be cord connected without a plug/receptacle such as elevators, motors, etc. The perception of some code users is that all cord wiring is "permanently installed" or "fixed wiring" or "permanently connected."
Panel Meeting Action: Reject
Panel Statement: The term being defined is not used in the Code and the proposal is not consistent with NEC Style Manual 2.2.2.
I-27 Log #540 NEC-P01
Final Action: Reject
(100. Disconnecting Means)
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 1-26
Recommendation: Accept the proposal.
Substantiation: The proposal is no more a “requirement” than that of other definitions, e.g., “accessible” (wiring methods) “without damaging the building structure or finish;” “cabinet” “provided with a frame;” “in sight from” “visible and not more than 15 m (50 ft) distant;” “rainproof” “constructed protected or treated;” “switch, general use snap” “constructed so that it can be installed;” switch. Motor circuit “rated in horsepower that is capable of”; ventilated “provided with a means.”
Panel Meeting Action: Reject
Panel Statement: The substantiation for submitter’s original proposal (1-26) describes devices which de-energize circuits. They do not disconnect conductors from their source of supply. Only disconnecting means do that. Neither the original proposal nor the comment indicates that Code users are confused by term of definition of Disconnecting Means.
The Panel reaffirms its statement on Proposal 1-26. The Proposal clearly, and improperly, adds a requirement to the definition. Such a requirement, if necessary, could be requested by the submitter for inclusion in the appropriate Code Sections through proposals for the 2011 NEC.
I-28 Log #689 NEC-P01
Final Action: Hold
(100. Dwelling Unit)
TCC Action: After reviewing the entire record, including the existing rules in 210.18 and 210.60, the Technical Correlating Committee directs that Comment 1-28 and Proposal 1-27 be reported as “Hold” for review during the 2011 revision cycle. Although the revised definition is suitable for application in NFPA 101 and 5000, the lack of other occupancies being defined in the NEC (such as dormitories, rooming houses, etc.) creates a concern for how the definition will be applied in the application of the NEC.
Submitter: Timothy M. Crouchore, Allegheny Power
Comment on Proposal No: 1-27
Recommendation: Please reject the original proposal.
Substantiation: The proposed statement in the substantiation that “the definition does not change the intent of any of the codes…” is not correct. Rather, adding the new term “housekeeping purposes” introduces a new concept that is not currently in any of the NFPA standards. Deleting the term “permanent provisions for cooking…” eliminates a long standing clarification for cooking between a portable microwave oven and an installed cook-top in a counter top. Also, the revised definition would now have all guest rooms of hotels and motels and college dormitories as dwelling units. The revised definition does not add clarity to the definition of dwelling unit. Rather, it changes the definition.
Panel Meeting Action: Reject
Panel Statement: The panel is eliminating the distinction between portable microwave ovens (as well as toaster-ovens and similar appliances) and installed cooktops, as many dwelling units do not contain permanent cooking appliances. The panel is also including those hotel rooms and dormitory rooms that meet the proposed definition among “dwelling units”.
Number Eligible to Vote: 12

I-29 Log #1859 NEC-P01
Final Action: Reject
(100. Dwelling Unit)
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 1-27
Recommendation: Include the word “permanent”, as follows:
Dwelling Unit. One or more rooms arranged for complete independent housekeeping purposes, with space for eating, living, and sleeping, permanent facilities for cooking, and provisions for sanitation.
Substantiation: Accepting this change as proposed would make any guest room or guest suite containing a microwave a dwelling unit. The proponent did not include any technical data that would justify incorporating the dwelling unit provisions into hotel/motel applications, such as AFCIs, GFCIs, receptacle placements, and so forth.
Panel Meeting Action: Reject
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

13-1 Log #4 NEC-P13
Final Action: Accept
(100. Electrical Power Production and Distribution Network)
“TCC Action: The Technical Correlating Committee notes that the direction given to the panel is addressed by their action on Comment 13-2. Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 1-28
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 13 for action. This action will be considered by Code-Making Panel 13 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-2 Log #768 NEC-P13
Final Action: Accept
(100. Electrical Power Production and Distribution Network)
Submitter: Louis A. Barrios, Shell Global Solutions
Comment on Proposal No: 1-28
Recommendation: Editorial change to present text as follows:
Power production, distribution, and utilization equipment and facilities, such as electric utility system that deliver electric power to the connected loads, that are external to and not controlled by an interactive system.
Substantiation: Editorial change on original panel action to improve grammar of definition. Refer also to Mr. Barrios’ affirmative comment.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

5-3 Log #1671 NEC-P05
Final Action: Accept
(100. Equipment Grounding Conductor (EGC))
Submitter: Phil Simmons, Olympia, WA
Comment on Proposal No: 5-6
Recommendation: Revise the definition to read as follows:
Equipment Grounding Conductor (EGC). The conductive path installed to connect normally non-current-carrying metal parts of equipment together and to the system grounded conductor or to the ground electrode, or both.
Retain the two FPNs.
Substantiation: The words “or both” should be added to the end of the definition to recognize that in many cases, the equipment grounding conductor is connected to both the system grounded conductor and to the grounding electrode.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

13-3 Log #85 NEC-P13
Final Action: Accept
(100. Fault Tolerant External Control Circuit (GOT))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-1
Recommendation: The Technical Correlating Committee understands that the Panel Action was to accept the proposed secondary definition which is the same text that appears in the 2005 Code.
The Technical Correlating Committee directs that the definition remain in 695.2, since it is only used in Article 695.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

3-2 Log #449 NEC-P03 Final Action: Reject
(100. Fire Stop)
Comment on Proposal No: 3-2
Recommendation: Accept this proposal.
Substantiation: 300.21 uses the term “firestopped” with an additional FPN. It seems reasonable to include a definition of “fire stop,” considering the importance of firestopping identified in 300.21.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any technical substantiation in his comment to justify adding this definition to the NEC. This term is only used once in the NEC, in Section 300.21, and generally a definition is only placed in Article 100 where that term is used in two or more articles of the Code. The panel reaffirms the panel statement from the proposal as follows: “Fire Stop” is a common phrase used in the building industry, similar to “fire rating” and “fire resistance” used in various sections in the NEC, that does not require a definition be inserted into Article 100 for the user of the NEC. Where these terms are used, the user of the Code can access other documents, such as NFPA 914 and the various building codes, to determine the meaning of these terms if he or she doesn’t already know the definition. Inserting all the building code definitions would make Article 100 totally unwieldy and difficult to use.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

5-4 Log #1853 NEC-P05 Final Action: Accept
(100. Ground)
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 5-8
Recommendation: Continue to Accept this Proposal as submitted.
Substantiation: The deletion of the unnecessary text will provide clarity to a widely misunderstood topic.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

2-4 Log #1886 NEC-P02 Final Action: Reject
(100. Ground-Fault Circuit Interrupter)
Submitter: Paul S. Hamer, Richmond, CA
Comment on Proposal No: 2-6
Recommendation: This proposal (and its companion Proposals 2-88, 2-285, 11-48 and 11-49 presented separately) should be added to the end of the proposal wording: This definition shall become effective January 1, 2011. This aligns with Mr. Weber’s Explanation of Negative for Proposal 2-88 regarding the development of new, life-saving concepts. Adding the delayed effective date would provide the incentive and the necessary time for the Three-PhaseGround-Fault Circuit-Interrupter System (GFCIS-3Ph) to be further developed and commercialized.
Substantiation: The Panel Statement of Proposal 2-88 (referred to in this Panel Statement) includes “...The submitter’s substantiation notes that the hazard is when unqualified persons work on equipment without taking the appropriate precautions to deenergize the circuit and verify that circuit is disconnected...”. There are numerous instances where unqualified persons were electrocuted by faulty or defective equipment (see the supporting material submitted with the proposals), and these people may have been protected from electrocution by the proposed GFCIS-3Ph. See also the Explanation of Negative of Mr. King and Mr. Weber for Proposal 2-88. The patent applications are pending for the GFCIS-3Ph as of this date, but further field measurements made since the Proposal substantiative date indicate that the distributed phase capacitances on an actual installed three-phase 480 volt power system are balanced enough to permit the sensitivity described in the proposals.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree with the addition of the system as proposed in Comment 2-62, and as such the definition is not added because it is not used in the NEC. See the panel action and statement on Comment 2-62.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:
KING, D.: Panel 2 should give further consideration to this proposed system. See my explanation of negative on Comment 2-62.

5-7 Log #2074 NEC-P05 Final Action: Accept
(100. Grounding Conductor)
Submitter: Chuck Mello, Underwriters Laboratories
Comment on Proposal No: 5-11
Recommendation: Revise definition to read as follows: “Grounding Conductor” should be revised to describe the full set of ground conductors that connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes. A general term used to include all conductors that connect equipment or systems to ground and that connect normally non-current carrying metal parts of equipment together.
FPN: Grounding electrode conductors, bonding conductors, and equipment grounding conductors all are types of grounding conductors.
Substantiation: The actions of the panel were correct to reject the deletion of this definition. After the full deliberations it appears the definition of “grounding conductor” should be considered for revision to ensure the concept of being all-inclusive. The proposed text clarifies that a “grounding conductor” would include grounding electrode conductors, equipment grounding conductors and bonding conductors. The term “grounding conductor” is still used many times in various articles of the 2008 Draft NEC and the context has different meanings that would be covered by this revised definition.
Panel Meeting Action: Reject
Panel Statement: The panel affirms that the original objectives of the TCC assigned Grounding and Bonding Task Group were to provide more accurate and specific definitions for words and terms related to grounding and bonding. This type of proposed generalization of the term “grounding conductor” reintroduces some of the inaccuracies and vagueness that the work of the grounding and bonding task group was responsible for reducing. The term “Grounding Conductor” is presently used in Articles 800, 810, 820, and 830 to identify the conductor that connects the communications systems grounding conductors and bonding conductors. The term “Grounding Conductor” is still used many times in various articles of the 2008 Draft NEC and the context has different meanings that would be covered by this revised definition.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

5-8 Log #1223 NEC-P05 Final Action: Accept
(100. Grounding Electrode)
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 5-14
Recommendation: The TCC Grounding and Bonding Task Group recommends that CMP-5 continue to Accept in Principle Proposal 5-14.
Substantiation: The TCC Grounding and Bonding Task Group agrees with the CMP-5 editorial revision to the Definition of the word “Grounding Electrode”.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-6 Log #2079 NEC-P05 Final Action: Accept (100. Grounding Electrode Conductor)

Submitter: Chuck Mello, Underwriters Laboratories

Comment on Proposal No: 5-18

Recommendation: Revise proposed definition to read as follows:

Grounding Electrode Conductor. A conductor used to connect the system grounded conductor or the equipment to a grounding electrode or to a point on the grounding electrode system.

Substantiation: The definition in the proposal effectively prevents the connection of the grounding electrode conductor to the building “master” or “central” ground bus that is specifically permitted in 250.64(C) and 250.64(F). Under the revised definition the ends of the grounding electrode conductor can terminate only either on a grounding electrode, defined in Article 100 and specified in 250.52, or on a system conductor, to establish a system grounded conductor, or on equipment enclosures. A better definition would be as stated above so as to not limit the terminations that are allowed by prescriptive text.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-9 Log #30 NEC-P05 Final Action: Accept (100. Grounding Electrode Conductor)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 5-18

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Code-Making Panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. See panel action on Comment 5-6.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

15-1 Log #54 NEC-P15 Final Action: Reject (100. Hospital Grade Receptacles)

Submitter: Deborah J. Mann, Debbie Mann Consulting, Inc.

Comment on Proposal No: 15-34

Recommendation: Define “Hospital Grade Receptacles” and place the term in the Index. It is currently used in regard to patient bed areas, but is not defined or referenced in the index.

Substantiation: I asked ten people, including two inspectors, what a hospital grade receptacle actually is and nobody knew correctly. Several people thought it was an insulated ground receptacle, including an electrical inspector.

Panel Meeting Action: Reject

Panel Statement: The term “Hospital Grade” used in reference to a receptacle refers to a standard of device manufacture and performance. Article 100 Definitions describe general conditions or installation considerations rather than device specifications.

In addition, the submitter did not provide a specific recommendation for action on Proposal 15-34.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

5-10 Log #671 NEC-P05 Final Action: Reject (100. Intersystem Bonding Termination)

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 5-20

Recommendation: The proposal as modified by the Panel Action should be Rejected.

Substantiation: The Panel Action to Accept in Principle by accepting the term “Intersystem Bonding Termination” into Article 100 is not in accordance with 2.2.2.1 of the NEC Style Manual which states that Article 100 shall contain definitions of terms that appear in two or more other articles of the NEC. The term “intersystem bonding termination” appears 6 times in the 2008 draft of the Code, once in Article 100 and the other 5 in 250.94. The definition of “intersystem bonding termination” may be included in 250.2 until such time as it appears in additional articles.

The definition “Intersystem Grounding Termination” in the original proposal could be accepted into Article 100 since it is used 33 times in 770.100, 800.100, 810.21, 820.100, and 830.100.

This Proposal should be correlated with Proposals 16-167 [800.100(B)], 16-236 [810.21(F)], 16-299 [820.100(B)], and 16-395 [830.100(B)] that address the use of the term “intersystem grounding termination” in those articles.

Panel Meeting Action: Reject

Panel Statement: The panel concludes that the term “Intersystem Bonding Termination” is in fact the correct terminology for this connection and where the term “Intersystem Grounding Termination” appears in Articles 770, 800, 810, 820, and 830 it should be changed to “Intersystem Bonding Termination” to be consistent with the proposed definition and 250.94. The panel requests that the TCC correlate the terminology as indicated here.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

2-5 Log #5 NEC-P02 Final Action: Accept (100. Kitchen (New))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 1-36

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 2 for action. This action will be considered by Code-Making Panel 2 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel agrees with the term to Article 100 and has deleted the same material from 210.8(B)(2) to avoid the definition appearing in two places.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Recommendation: Change the definition of “Lighting Outlet” in Article 100 as follows:

“Lighting Outlet. An outlet intended for the direct connection of a lampholder or luminaire (lighting fixture), or a pendant cord terminating in a lampholder.”

FPN: A receptacle outlet, switched or unswitched, is never by definition a lighting outlet, even if the receptacle is dedicated solely to lighting service as in 410.30(C)(1). A receptacle outlet may be counted in lieu of a required outlet as permitted by Exception No. 1 to 210.70(A)(1).

Substantiation: The submitter of Proposal 1-39 is incorrect in stating that the existing definition of “lighting outlet” could be interpreted to disallow the installation of a luminaire as described in 410.30(C)(1). Section 410.30 does not state that the circuit to which the electric-discharge fixture is connected by cord and plug is a “lighting outlet”. This outlet is, in fact, a switched receptacle outlet. But the outlet could be converted to a “lighting outlet” by removing the receptacle and directly wiring the luminaire to the branch circuit at that point. Nowhere in the code is it stated that a luminaire must be connected to a lighting outlet, nor does it state or imply that connecting a luminaire with a cord and plug to a receptacle converts the receptacle to a lighting outlet. An outlet becomes a lighting outlet when a luminaire is directly wired to the branch circuit at the outlet, i.e., not connected to the branch circuit through a plug/receptacle connection.

The submitter’s statement: “This would also negate Exception No. 1 of 210.70(A)(1)” is confusing since the definition of “this” is unclear. 210.70(A)(1) requires a switching outlet in all habitable rooms in a dwelling unit. Exception No. 1 permits a switched receptacle to be counted as the required lighting outlet in all of the habitable spaces except the bathroom and kitchen. Therefore, if a switched receptacle outlets are just permitted to be counted as the required lighting outlet by the code, but there is no guarantee that a luminaire will be plugged into it. The requirement for direct-wired luminaires in bathrooms and kitchens is a safety issue that assures lighting for the bath and kitchen can be made available without having to resort to cord and plug connected luminaires in zones around bathtubs and sinks. Whichever way we interpret the submitter’s statement, the proposed modification to the definition of lighting outlet would not change the meaning of the application of this exception in the code, nor does the definition as it exists now negate the need for this exception.

CM-1 erred in deleting the word “direct” from the definition of “lighting outlet.” This change does not fix the problem that the submitter believes is present, and introduces conflict in other portions of the code that would have to be repaired. For example, this change would permit any switched receptacle outlet in a dwelling unit with a cord and plug connected luminaire connected to it, to qualify as a lighting outlet. A code-compliant dwelling could be constructed without having any luminaires installed.

The submitter’s concerns seem to revolve around confusion, especially among inspectors and electrical contractors, regarding the meaning of the term “lighting outlet”. The submitter’s fix, and the CMP-1 fix, seem to cause more problems than they correct. This confusion could simply be cleared up by adding a fine print note to the definition in Article 100. This would clarify the meaning of the definition without introducing changes that would impact other code sections.

CM-18 also recommends removing the phrase “or a pendant cord terminating in a lampholder” from the definition. There are no listed cord-connected lampholders. There are “cord-connected luminaires,” but these are covered by the definition of “luminaire” and do not need to be specifically addressed in the definition of “lighting outlet.”

This comment was balloted through CM-18 with the following ballot results:

- Eligible to Vote: 14
- Affirmative: 1
- Negative: 1

Panel Meeting Action: Accept in Part

The panel accepted the definition of “Lighting Outlet” in Article 100, with a minor editorial change.as submitted by CM-P-18 as follows:

“Lighting Outlet. An outlet intended for the direct connection of a lampholder or luminaire (lighting fixture),”

The panel rejects the inclusion of the FPN.

Panel Statement: The panel accepts the revised definition, but rejects the addition of the FPN because it contains a requirement which is not allowed in 3.1.3 of the NEC Style Manual.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCM Ahill, L.: I concur with the removal of the FPN; however, I disagree with CMP-1’s action of adding the word “direct” to the definition and deleting “or a pendant cord terminating in a lampholder” from the definition. An “Outlet” is defined as “A point on the wiring system at which current is taken to supply utilization equipment.” Lampholders and luminaires are utilization equipment. Utilization equipment can be permanently connected or cord- and plug-connected to the wiring system. Adding the word “direct” appears to negate the use of a cord- and plug connection allowed by Section 410.30(C)(1). Exception. In addition, deletion of “or a pendant cord terminating in a lampholder” appears to prohibit field installed pendant lampholders. I doubt that this was the intent of CMP-1.


Recommendation: Accept the proposal in principle. Revise the definition to read as follows:

“Lighting Outlet. An outlet intended for the connection of a luminaire, luminaire (lighting fixture), or a pendant cord terminating in a lampholder.”

Substantiation: The Task Group agrees this action meets the intent of the submitter. The submitter of this change was concerned that the existing definition would not allow a receptacle to be used to supply a cord and plug luminaire allowed by 210.70(A)(1) Exception No. 1. In the future, possibly moving Exception No. 1 up into the main body of the text may put this section into a more positive language. The Task Group disagrees that the existing wording negates the exception allowed in 210.70(A)(1).

This comment was balloted through CM-P-2 with the following ballot results:

- Eligible to Vote: 12
- Affirmative: 10
- Negative: 1

Panel Meeting Action: Reject

Panel Statement: The Panel concludes that “pendant cord terminating in a luminaire” is extraneous and inclusion of “direct” connection is appropriate. See panel action and statement on Comment 1-30.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCM Ahill, L.: See my explanation of negative vote on Comment 1-30.
The panel accepts the recommendation of the Technical Correlating Committee. It describes performance attributes of the product. It does not belong in Article 70-5.

**Recommendation:**

Add an FPN to the definition of metal-enclosed power switchgear.

**Comment on Proposal No:** 9-2

Submitter: Charles M. Trout, Maron Electric Co. Inc.

**Comment on Proposal No:** 5-28

Recommendation: This proposal should be Accepted. This proposal properly defines the neutral conductor as the common conductor in a multwire circuit that carries the current caused by an imbalance of the load on the phase conductors of a multwire circuit. It does not suggest, as the accepted Proposal 5-36 does, that an unbalanced load is a normal condition and, therefore, a presumably correct wiring design. It also maintains the technical correctness that a two wire circuit cannot contain a neutral conductor. It does not pretend that because a conductor is connected to the neutral point of a system that it is a neutral conductor anymore than trying to say that a grounding electrode conductor is a neutral conductor because it is connected to the neutral bar. A neutral conductor must function as a neutral conductor and carry only the unbalanced load in multwire circuits and remain noncurrent-carrying in multwire circuits supplying balanced loads.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 5-12.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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**5-13 Log #1676 NEC-P05 (100. Neutral Conductor)**

**Final Action:** Reject

**Submitter:** Charles M. Trout, Maron Electric Co. Inc.

**Comment on Proposal No:** 5-36

Recommendation: This Proposal should be Rejected. The proposal suggests that the neutral conductor is intended to carry current under normal conditions. What are normal conditions? Is a balanced multwire circuit a normal condition? Is an unbalanced multwire circuit a normal condition? The substantiation suggests that a conductor can be neutral even though it does not function as a neutral conductor. This doesn’t make sense and will only confuse the issue more.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comments 5-12 and 5-17.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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**5-15 Log #1829 NEC-P05 (100. Neutral Conductor)**

**Final Action:** Reject

**Submitter:** Fred W. Brown, HI Electron

**Comment on Proposal No:** 5-21

Recommendation: Add a new definition: Neutral Conductor. A grounded conductor that is connected to the neutral point of a symmetrical electrical system and carries the vectorial summation currents of the ungrounded to ground conductor loads in multwire branch circuit, feeder, and service entrance conductors.
Substantiation: It is important for the National Electrical Code (NEC) to be technically correct. The current excepted definition of Neutral Conductor (Proposal 5-36 Log #1554) may lend itself to miss application of some of the NEC. By the present accepted definition, when looking at the application of 310.15(B)(4) a neutral conductor may never be counted as a current-carrying conductor.

NEC Panel 2 has found it important to require the grouping and identification of the grouping of ungrounded and grounded conductors of each multwire branch circuit (Proposal 2-17 Log #3378). The importance of this is found in my definition of neutral conductor, not in fact that the conductor is grounded. I would encourage the committee to accept this comment.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 5-12.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-16 Log #1960 NEC-P05 Final Action: Reject
(100. Neutral Conductor)

Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 5-36
Recommendation: This Proposal should have been Accept in Principle with additional modification of the definition of Neutral Conductor as follows:

"Neutral Conductor. The conductor connected to the neutral point of a system that is intended to carry unbalanced current under normal conditions and may carry fault current or unbalanced current under abnormal conditions."

Substantiation: Unfortunately, the accepted definition does not accomplish all of the clarifications needed, and so it is not technically accurate. As noted in the panel statement, the neutral conductor will carry current "under some normal conditions", but that does not mean all normal conditions. For example, a neutral conductor in a three-phase wye system that supplies only three phase loads will never carry current under normal conditions. However, a neutral conductor will carry any unbalanced current in the system that may occur normally if there are connected single-phase loads, or abnormally because of some phase failure conditions. The neutral service conductor or the neutral conductor ahead of the bonding point of a separately derived system will also be called on to carry fault current - also not normal conditions. In addition, this definition does not address the neutrals of impedance-grounded systems that carry current only under abnormal conditions.

Panel Meeting Action: Reject
Panel Statement: The additional wording does not add clarity. The neutral conductor can carry current other than unbalanced current, e.g. nonlinear loads. The term "unbalanced" is not defined. The panel reaffirms its actions and statement on Proposal 5-36 that resulted in the new definition.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-17 Log #2139 NEC-P05 Final Action: Reject
(100. Neutral Conductor)

Submitter: Ryan Jackson, West Valley City, UT
Comment on Proposal No: 5-36
Recommendation: Accept the Proposal with the following change:
Neutral Conductor. The conductor connected to the neutral point of a system, Neutral Point. Unchanged.
FPN: Unchanged.

Substantiation: The condition that the defined conductor "is intended to carry current under normal conditions" makes the existing language in 250.36(a) discrepancy. The conductor between XO and the impedance of an impedance grounded system is currently referred to as a neutral conductor. This conductor does not carry current under normal conditions, but does carry current under fault conditions.

A similar comment is being made to the proposed change in 250.36 (5-133) that would allow the technical committees to change all of the language in 250.36 so that it doesn’t conflict with all of section 250.36. These two comments should be correlated so the discrepancy between 250.36 and the definition does not occur.

Panel Meeting Action: Reject
Panel Statement: The phrase "is intended to carry current under normal conditions" is needed to differentiate the neutral conductor from the equipment grounding conductor.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-18 Log #1501 NEC-P05 Final Action: Accept
(100. Neutral Conductor and Neutral Point)

Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc
Comment on Proposal No: 5-36
Recommendation: Technical Correlating Committee Task Group on the definition of “Neutral Conductor” concurs with the panel action on this proposal.

Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.” Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC), Paul Dobrowsky (CMP 5), Walter Skuggveig (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP 2, TCC), Bill Laider (CMP 6), and Oran Post (CMP 6). The TCC directed that the action on this proposal be sent to the TG for review and comment.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

1-33 Log #769 NEC-P01 Final Action: Reject
(100. Premises Wiring (System))

Submitter: Louis A. Barrios, Shell Global Solutions
Comment on Proposal No: 1-43
Recommendation: The panel action should have been to “accept” rather than “accept in principle.”

Substantiation: The Panel’s revised definition changes the intent of the submitter’s proposal, which was to eliminate the list of “separately derived systems”, does not add clarity to the original proposal and may introduce more confusion.

Panel Meeting Action: Reject
Panel Statement: The Proposal was modified by the Panel so as to be technically correct.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:
MCMALLIL, L.: Proposal 1-43 should have been accept as submitted - the substantiation justified the change. The proposal simply recommended eliminating the list of “source of power” examples and use the definition of “separately derived system” in place of the examples. The revised definition simply adds further confusion. CMP-1 noted that “premises wiring can exist on the supply side of a separately derived system.” This is a true statement; however, “where there is no service point” premise wiring is typically supplied by a separately derived system. A separately derived system being “a source of electric energy or equipment other than a service.”

1-34 Log #1851 NEC-P01 Final Action: Reject
(100. Premises Wiring (System))

Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 1-43
Recommendation: The Proposal should be Accepted as originally proposed.
Substantiation: The intent of this proposal was to make this definition simpler. The changes proposed by the panel simply make this definition more difficult, without adding any benefit to the code user.

Panel Meeting Action: Reject
Panel Statement: The Proposal was modified by the Panel so as to be technically correct.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:
MCMALLIL, L.: See my explanation of negative vote on Comment 1-33.

8-1 Log #536 NEC-P08 Final Action: Reject
(100. Raceway)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 8-1
Recommendation: Accept the proposal or alternatively add:
“Cablebus and auxiliary gutters are not considered raceways.”

Substantiation: Cable bus and auxiliary gutters are also designed to hold wires and cables. Though cablebus is not completely enclosed neither is lighting or trolley busway. Auxiliary gutters are usually listed as trolley busway, thus use determine if it is a raceway? “Not limited to” appears to leave an option for the AHJ to consider them as raceways as there is no specific prohibition against considering them as such.

Panel Meeting Action: Reject
Panel Statement: While the panel agrees cablebus and auxiliary gutters are not raceways, there is no justification for placing electrical products that are not raceways in this definition.

The Panel reiterates that cablebus and auxiliary gutters are used in some ways similarly to raceways. The restrictive use of cablebus and auxiliary gutters prevents them from being grouped with raceways. Cablebus is an assembly of components furnished or specified by the manufacturer. Auxiliary gutters are permitted to supplement wiring spaces at meter centers, distribution centers, switchboards, and similar points of wiring systems.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
While it is true that no other raceway has its definition in Article 00, it is "The panel took exception to including HDPE as RNC." The 993 - 2002 (RNC) is needed in Article 00, as can be seen from the Panel statement that

FLOYD, H.: The application of Arc Resistant Switchgear in US markets has frequency of personnel exposure to hazardous arcing faults. While I support

in other global regions demonstrate that arc resistant designs can reduce the

this design. Experience in installations in the US and longer-term experience

Comment on Affirmative:

is appropriate. The addition of this FPN would greatly enhance worker safety

the NEC to IEEE C37.20.7 for description and testing of listed arc-resistant

a FPN under the Section 0.6 Flash Protection. A FPN referring users of

Panel Statement:

Explanation of Negative:

Ballot Results:

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

ARTICLE 110 — REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

1-36 Log #703 NEC-P01

(110.3(B))

Final Action: Reject

Submitter: Edward G. Kroth, Westphal & Company Electrical Construction

Comment on Proposal No: 1-52

Recommendation: Revise as follows:

Listed or labeled equipment shall be installed and used in accordance with any instructions included with the listing and labeling, provided the instructions, listing or labeling do not conflict with this code.

Substantiation: I agree with the Panel's rejections of Proposals 1-52 and 1-53, however, I will take this opportunity to address another problem with 110.3(B) that I have come across. Over the years I've seen various instructions from manufacturers that have contradicted some code article or section. I have provided the latest one that I recently came upon. Note that the manufacturer on page 3 of their instructions has figures 3 and 4 incorrect and instruct the installer to violate section 110.15 (High leg marking) of the NEC. The above added portion of 0.3(B) relieves me of the conflict of following the instructions [present 110.3(B)], but violating 110.15. This may seem to be a minor error on the manufacturer's part, but could become a safety (or legal) issue when someone goes to service the item and does not realize that things are not as they should be according to the code.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: Listed and labeled equipment is clearly identified for installation in accordance with applicable Codes including the NEC. Instructions for listed and labeled equipment are reviewed for compatibility with the NEC. Code users are never "required" to violate Code requirements and 90.4, 110.2 and 110.3(A) clearly support this. In the event an error in instructions is identified, it should be brought to the attention of the manufacturer, the listing or labeling body and the standards developing organization using dedicated processes.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

1-37 Log #808 NEC-P01

(110.3(B))

Final Action: Reject

Submitter: Joseph A. Hertel, Safety and Buildings

Comment on Proposal No: 1-53

Recommendation: Revise text to read:

(B) Installation and Use. Listed or labeled equipment shall be installed or used, or both, in accordance with any instructions included in the listing and labeling, provided the instructions, listing or labeling do not conflict with this code.

Substantiation: Not all listed and labeled equipment is installed and used. In some cases, it is one or the other. The additional statement "provided the instructions, listing or labeling do not conflict with this Code" is necessary to rule out the use of products that are listed and used in ways other than intended by the listing or appropriate standard to which they were evaluated. Plant operators may install equipment such as dental clinics where the cabinets were supplied with receptacles supplied through cords. While they were listed, they could not be used in the intended location without the redundant equipment ground required in 517.13.

Panel Meeting Action: Reject

Panel Statement: Listed and labeled equipment is clearly identified for installation in accordance with applicable Codes including the NEC. Rejection of listed or labeled equipment that is being used in a manner inconsistent with its listing or labeling is already addressed in 110.3 and the additional proposed text is not necessary for this instance.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

1-38 Log #283 NEC-P01

(110.7)

Final Action: Accept in Principle

Submitter: Code-Making Panel 5,

Comment on Proposal No: 1-58

Recommendation: It is recommended that CMP-1 accept the proposal as submitted.

Substantiation: The revised text proposed is technically correct. The revision in this section is also consistent with current proposed and accepted revisions to the definition of the word "ground" as "the earth," See CMP-5 action and statement on Proposal 5-8 (Log #1515). The submitter clearly indicated that the proposal was part of a larger effort to clarify the use of words and terms related to grounding and bonding. The word "ground" is one such word. The word "grounds" was also used in three other sections of the 2005 edition and previous editions of the NEC where the words "ground fault" or "ground faults" should be used. The proposals submitted to CMP-11 to revise those sections where the undefined word "grounds" is used were accepted as they
add clarity and consistency in the use of a defined term. See panel actions and statements on Proposal 11-39 (Log #409) and 11-97 (Log #412). For reasons of consistency, correlation, and technical accuracy it is recommended that CMP-1 consider accepting this proposal.

This comment has been balloted through CMP-5 with the following ballot results:

| Number Eligible to Vote: 12 | Ballot Results: Affirmative: 12 |

I-39 Log #770 NEC-P01 Final Action: Accept in Principle (110.7)

Submitter: Louis A. Barrios, Shell Global Solutions

Comment on Proposal No: 1-58

Recommendation: The panel action should have been to “accept in principle” rather than “accept in principle in part” with proposed changes as suggested in Mr. Barrio’s negative ROP ballot comment shown below.

110.7 Insulation Integrity. Completed wiring installations shall be free from short circuits and ground faults and from any connections to ground other than as required or permitted in Article 250 elsewhere in the Code.

Substantiation: CMP-1 should have accepted the submitter’s intent to clarify the term “grounds”. The following wording is proposed which should meet the submitter’s intent and eliminate the redundancy of referencing Article 250 and elsewhere in the Code.

Panel Meeting Action: Accept in Principle

Revise the commentors recommendation to read as follows:

110.7 Insulation Integrity. Completed wiring installations shall be free from short circuits, ground faults, or any connections to ground other than as required or permitted elsewhere in this Code.

Panel Statement: The panel concludes that revised text more clearly explains three conditions in 110.7. The panel also concludes that the revisions satisfy the commentors concerns.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

I-39a Log #CC100 NEC-P01 Final Action: Accept (110.7 (Title))

Submitter: Code-Making Panel 1, Comment on Proposal No: 1-58

Recommendation: Change the title of 110.7 from “Insulation Integrity” to “Wiring Integrity”.

Substantiation: The panel concludes that this revision more accurately describes the subject matter of this section.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

I-40 Log #1321 NEC-P01 Final Action: Reject (110.9)

Submitter: Vincent J. Saporita, Cooper Bussmann

Comment on Proposal No: 1-60

Recommendation: The panel should accept a modified version of the original proposal and place it as the new third paragraph of 110.9. Modify the proposal to read:

An enclosure containing main or feeder overcurrent protective devices shall be field marked with the available short-circuit current.

Substantiation: The proposal change in this comment limits the marking requirement to enclosures containing main or feeder overcurrent protective devices, where there is a greater chance that 110.9 will be violated.

The panel statement given for rejecting the original proposal was basically that the available fault current was dependent upon the utility and utility systems change, so the available short-circuit current would change. Therefore, it would be misleading. I’ve heard that logic compared to a doctor’s office refusing to take a patient’s blood pressure “because it will surely change”, and “that could be misleading”. It’s far better (and safer) for an electrician to know the available short-circuit current at one time in the past than not to have any clue as to the available short-circuit current. Yes, the value can and likely will change over time, it could go up or down. But, isn’t it better to have a baseline with which to operate than to have to guess at all? Let’s give future electricians the extra degree of safety that we can by informing them of the available short-circuit current so that they can make the most intelligent decisions possible.

Gathering this information is already a requirement in order to comply with 110.9, so it’s not a matter of creating a lot of extra work. Once the values are obtained, it becomes a simple task to mark the enclosure.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its statement on Proposal 1-60. Although at the time of installation, utility available fault currents are provided so that adequate equipment can be installed, those values may be conservative so as to allow for anticipated or possible future system changes. From a personnel protection standpoint, it would be misleading to base PPE requirements on either the rating of the equipment or the actual fault current at the time of installation. To be sure proper PPE is selected, the system parameters must be known and the available fault current calculated at the time work is performed.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

HICKMAN, P.: We are voting negative to the panel action to reject Comment 1-40. Our explanation is as follows: The comment should have been accepted. Accepting this comment will, in our opinion, greatly enhance electrical safety. We feel the submitter’s comment is a reasonable recommendation and we agree with the submitter that this will help ensure compliance with 110.9. In addition, we believe that this will help ensure that adequate equipment can be installed, those values may be conservative so as to allow for anticipated or possible future system changes. From a personnel protection standpoint, it would be misleading to base PPE requirements on either the rating of the equipment or the actual fault current at the time of installation. To be sure proper PPE is selected, the system parameters must be known and the available fault current calculated at the time work is performed.

I-41 Log #300 NEC-P01 Final Action: Accept (110.11)


Recommendation: Continue to accept Proposal 1-61.

Substantiation: It was the action of the Technical Correlating Committee that Proposal 1-61 be referred to CMP-11 for comment. This comment is the result of that request. CMP-11 supports the continued acceptance of Proposal 1-61. This is in addition to the continued support of Proposal 1-95, which provides requirements for all types of enclosures, not just for motor controller enclosures as is currently found in 430.91. Proposal 11-55, a companion proposal which deletes similar requirements as they apply specifically to motor controller enclosures, was passed by a vote of 15 to 0 by CMP-11.

This comment has been balloted through CMP-11 with the following ballot results:

| Number Eligible to Vote: 12 | Ballot Results: Affirmative: 12 |

I-44 Log #1321 NEC-P01 Final Action: Accept (110.9)

Submitter: Vincent J. Saporita, Cooper Bussmann

Comment on Proposal No: 1-60

Recommendation: A revised version of the original proposal and place it as the new third paragraph of 110.9. Modify the proposal to read:

An enclosure containing main or feeder overcurrent protective devices shall be marked with the available short-circuit current.

Substantiation: The proposal change in this comment limits the marking requirement to enclosures containing main or feeder overcurrent protective devices, where there is a greater chance that 110.9 will be violated.

The panel statement given for rejecting the original proposal was basically that the available fault current was dependent upon the utility and utility systems change, so the available short-circuit current would change. Therefore, it would be misleading. I’ve heard that logic compared to a doctor’s office refusing to take a patient’s blood pressure “because it will surely change”, and “that could be misleading”. It’s far better (and safer) for an electrician to know the available short-circuit current at one time in the past than not to have any clue as to the available short-circuit current. Yes, the value can and likely will change over time, it could go up or down. But, isn’t it better to have a baseline with which to operate than to have to guess at all? Let’s give future electricians the extra degree of safety that we can by informing them of the available short-circuit current so that they can make the most intelligent decisions possible.

Gathering this information is already a requirement in order to comply with 110.9, so it’s not a matter of creating a lot of extra work. Once the values are obtained, it becomes a simple task to mark the enclosure.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its statement on Proposal 1-60. Although at the time of installation, utility available fault currents are provided so that adequate equipment can be installed, those values may be conservative so as to allow for anticipated or possible future system changes. From a personnel protection standpoint, it would be misleading to base PPE requirements on either the rating of the equipment or the actual fault current at the time of installation. To be sure proper PPE is selected, the system parameters must be known and the available fault current calculated at the time work is performed.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

HICKMAN, P.: We are voting negative to the panel action to reject Comment 1-40. Our explanation is as follows: The comment should have been accepted. Accepting this comment will, in our opinion, greatly enhance electrical safety. We feel the submitter’s comment is a reasonable recommendation and we agree with the submitter that this will help ensure compliance with 110.9. In addition, we believe that this will help ensure that adequate equipment can be installed, those values may be conservative so as to allow for anticipated or possible future system changes. From a personnel protection standpoint, it would be misleading to base PPE requirements on either the rating of the equipment or the actual fault current at the time of installation. To be sure proper PPE is selected, the system parameters must be known and the available fault current calculated at the time work is performed.
Electrical equipment shall be installed in a manner consistent with the requirements of the NEC. The scope of ANSI/NECA-2006 specifically states that the Code is not intended to be an instruction manual for untrained persons. The instruction manual for untrained persons. If the FPNs are allowed to reference installation manuals exist and to only mention one does not adequately inform.

Recommendation:

Comment on Proposal No:
Submitter:
______________________________
______________________________

Substantiation:

-2006. It is now disingenuous that CMP- would accept referencing "other ANSI-approved installation standards" that are of unknown content and of unknown publication dates. CMP- considered accepting Proposal 1-63 that would have deleted the FPN but the vote was 6-5. The accept motion on Proposal 1-63 to delete the FPN was because the standard publication, ANSI/NECA-1-2006, was not ready for distribution and thus review by CMP-1. CMP-1 then, after much discussion, finally accepted Proposal 1-64 that requested updating the publication date of the referenced standard without CMP-1 review by a vote of 7-5. However that vote changed the last several Code cycles to limit the use of FPNs, and no such injunction appears in 3.1.3 of the NEC Style Manual.

Proposal -62

Mr. J. Caccamese voted affirmatively stating: "Acceptance of Proposal 1-61 is consistent with my previous comment to the affirmative for Proposal 11-55 by addressing my concern to ensure that both Panel 1 and Panel 11 are in agreement."

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

1-42 Log #1512 NEC-P01 (110.11) Final Action: Accept

Submitter: James Wiseman, Schneider Electric / Square D
Comment on Proposal No: 1-61
Recommendation: The Panel should continue to accept Proposal 1-61.
Substantiation: This revision will significantly ease the determination of which enclosures require protection against permanent damage from the weather during building construction.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

1-43 Log #997 NEC-P01 (110.12) Final Action: Reject

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing
Comment on Proposal No: 1-62
Recommendation: Revise text to read as follows:
Electrical equipment shall be installed in a manner consistent with the requirements of the NEC.

Substantiation: I agree with Mr. Lanny McMahill that it is well worth our while to rephrase this, as the submitter, Mr. Young, proposed, so as to make compliance and enforcement easier. It would be tautological to say that this code requires compliance with this code, and the issue of incorporating specific other standards by reference also is valid. However, removing the term "near" as a global requirement is important, because too many undertrained enforcement personnel fall back on this characteristic where it is irrelevant to safety. Neatness has nothing to do with practical safeguarding. Workmanship is an issue of following accepted industry practices. The term, "accepted practices" is consistent with other NEC usage. I have seen, for example, many a panel installation with conductors ever-so-neatly trained and lined up perfectly parallel where they leave the breakers-but two grounded conductors in one terminal opening, or grounded and grounding conductors sharing a terminal in the grounding bar. I’d rather see the workmanlike practice of following the instructions on the schematic, and forget neatness, leave the conductors all calliwampus.

Panel Meeting Action: Reject
Panel Statement: If the comment were accepted, Section 110.12 would allow "accepted industry practices" to override any Code requirement.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:

MCMAHILL, L.: CMP-1 should have accepted this comment. CMP-1’s statement that accepting this comment would "override any Code requirement" is incorrect. Section 110.12 is titled "Mechanical Execution of Work." "Mechanical Execution of Work" is not intended to override minimum code requirements. No different than "installed in a neat and workman like manner" is. See my comment on Proposal 1-62.

1-44 Log #1790 NEC-P01 (110.12) Final Action: Reject

Comment on Proposal No: 1-65
Recommendation: The panel is encouraged to accept proposal 1-65 for the following reasons.
Substantiation: 1) The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2) There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3) The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.

1-44a Log #CC101 NEC-P01 (110, FPN ) Final Action: Reject

TCC Action: The Technical Correlating Committee advises that creation of a new annex is the responsibility of the Technical Correlating Committee and the Technical Correlating Committee rejects the panel action. Location of all references in an Annex does not enhance usability. Submitter: Code-Making Panel 1 Comment on Proposal No: 1-165
Recommendation: The panel recognizes that the TCC has purview over the creation of a new annex. The panel recommends that a new Annex "X" be created in accordance with the 2003 NFPA Manual of Style, sections 1.9.11.10 & 11 and 3.6.4, and that all standards currently referenced in the NEC FPNs, other than product safety standards which are already located in Annex A, be moved to the new annex. This would provide a useful resource to users of the code.

ANTHONY, M.: Fine Print Notes are essentially hyperlinks (tags) we put at critical points in the NEC where we sustain the NEC’s place at the center of world wide electrical safety practice. We should anticipate using more of them in the future as the world markets become more interconnected and our technology permits us to use the code in delivery formats other than the printed page. We should not be taking them out but reserving them for the future and working harder to get codes and standards to agree as they evolve.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Report on Comments A2007 — Copyright, NFPA

70-19
BARRIOS, L.: The present format of using FPNs immediately following the text of the NEC not only aids in compliance, but also makes the Code user friendly. For example, FPNs No. 1 and 2 in Section 310.16 refer the code reader to NFPA 70e and ANSI Z535.4 for additional information on arc flash hazards and equipment labeling. Moving these two references to an Annex, would essentially have the same effect as removing the references altogether. The typical code user is not going to flip to an annex to see what standards may be applicable to a given section.

STAUFAFFER, H.: I am voting against this recommendation to the Technical Correlating Committee, and feel that references to industry standards other than product safety standards should remain in Fine Print Notes for two reasons:

1. Usability - having references to industry standards located near the NEC rules to which they apply is more convenient for users. Segregating these references in an annex at the back of the Code book decreases the chance that users will be aware of them.

2. Copyright protection - having more FPNs in the NEC helps protect NFPA's intellectual property. There is continuing debate about whether, when states and local jurisdictions adopt the Code into law, the resulting document is still a copyrighted NFPA publication, or whether it enters the public domain. However, state and local governments typically adopt only the mandatory text of the NEC, not including explanatory information in FPNs and annexes. Since annexes come at the end of the Code book, they can be deleted without affecting the main NEC text. However, the existence of the Fine Print Notes located within the mandatory text of the Code helps differentiate the NEC-as-published-by-NFPA from the NEC-as-adopted-into-law. For this reason, keeping more FPNs, rather than consolidating the same information based on the FPNs throughout the Code. In the text of the Code, a footprint item should refer the reader to the Annex for the expanded description of the referenced material. EEI supports the listing of ANSI C2 the National Electrical Safety Code in the annex with its reference to 2005 NEC Sections 90.2(A), FPN and 110.31(C)(1), FPN for example.

FPN: Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AI SI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If CMP continues to accept this FPN, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement, for generic, readily available, information, which must be purchased by the code user. Code-Making Panel 1 should consider taking an action to delete this FPN to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP 1 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AI SI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If CMP 1 continues to accept this Fine Print Note in any form, an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 1-44.

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 1-63
Recommendation: This Proposal should be Accepted.
Substantiation: The submitter corrects, the addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement, for generic, readily available, information, which must be purchased by the code user. Code-Making Panel 1 should consider taking an action to delete this FPN to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP 1 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AI SI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If CMP 1 continues to accept this Fine Print Note in any form, an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 1-44.

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 1-65
Recommendation: This Proposal should be Accepted.
Substantiation: The submitter is correct, the addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement, for generic, readily available, information, which must be purchased by the code user. Code-Making Panel 1 should consider taking an action to delete this FPN to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP 1 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AI SI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If CMP 1 continues to accept this Fine Print Note in any form, an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 1-44.

Submitter: Danny Grant, National Electric Company
Comment on Proposal No: 1-63
Recommendation: This Proposal should have been Accepted to delete the FPN:
FPN: Accepted industry practices are described in ANSI/NECA 1-2000, Standard Practices for Good Workmanship in Electrical Contracting and other ANSI-approved institution-standards.
Substantiation: I agree with Mr. Miller’s substantiation in Proposal 1-63 which states: “this is one more example of extra material which does not benefit the NEC or its user”. Not only does it not benefit the NEC, it contradicts what is already mandatory and also causes confusion. In addition, it is an unnecessary burden for the industry to have to purchase a copy of a standard at significant cost for each installer that tells us little beyond what we already know and that is already readily available for free from various sources.

For example, in Section 3 of the Standard (General Requirements), it states that neat and workmanlike manner shall be apparent. The word “shall” constitutes mandatory language which, coupled with the word apparent, is likely not enforceable, is subjective, and, therefore, may be unattainable.

A Standard that requires neat and workmanlike to be “apparent” is not appropriate for inclusion, even as a fine print note, into the NEC.

In addition to requiring something that is unenforceable, vague, and ambiguous, the scope of the code document tells installers that they should follow the NEC. While this standard requires me to do something that is vague and unenforceable, it also tells me that following the NEC is optional.

Those are just two of the problems I see in this document. Even the title suggests that these rules are only for contractors (Good Workmanship in Electrical Contracting). What about work done by the maintenance staffs in facilities? Do these rules not apply to them? Do these rules only apply to contractors?

I, as a NECA contractor, along with very knowledgeable inspectors, have never had a problem understanding what a neat and workmanlike installation is. I wonder why NECA chooses to engage in the publishing business when there are real challenges facing contractors in today’s market.

Panel Meeting Action: Reject

Number Eligible to Vote: 12

Ballot Results: Affirmative: 2

Explanation of Negative:

Hittinger, D.: See my explanation of negative vote on Comment 1-44.

Minick, J.: See my explanation of negative vote on Comment 1-44.

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Recommendation:

Revise text to read as follows:

1) The addition of “intended” to the panel text is to make it clear that there may be openings that are there, but not necessarily used as part of that particular installation. A good example is drainage openings in a 3R enclosure that is installed indoors. Clearly the openings are there, but they are not used in that application. Another example is mounting holes that are in the back of the enclosure, but are not used because the enclosure is mounted from its side.

2) The new words “or permitted as part of the design for listed equipment” is intended to address a conflict that is created by the proposed wording and the product standards. For example, UL-50 – Standard for Enclosures has specific allowances for additional (albeit small) openings in an enclosure. These openings may have been necessary for the manufacturing process (such as drain openings for paint during the painting process) and have no application in the final use of the product.

It is important that this language be adjusted to avoid contractors having to fill in ways to fill openings that were intended by design and by allowance in the product standard to remain open.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Explanation of Negative:

MCMahill, L.: I concur with CMP-1’s action; however, to simplify the section it may have been appropriate to say, “Unused openings, other than those intended for operation or mounting purpose, or those permitted as part of the design of the equipment, shall be closed.”

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Recommendation:

Revise text to read as follows:

Label should be placed by the manufacturers on all switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized. The marking shall warn that only qualified person(s) should access the equipment and warn of the potential electric arc flash hazard.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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Recommendation:

Revise proposed 110.16 to read:

Switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential electric arc flash hazards. The marking shall indicate the available fault current. The marking shall reflect the date the calculations for available fault current were performed and the marking shall be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

Panel Meeting Action: Reject

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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Panel Meeting Action: Reject

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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Recommendation:

Revise text to read as follows:

(A) Unused Openings. Unused openings, other than those intended for the operation of equipment, intended or for mounting purposes or permitted as part of the design for listed equipment, shall be closed to afford protection substantially equivalent to the wall of the equipment. Where metallic plugs or plates are used with nonmetallic enclosures, they shall be recessed at least 6 mm (1/4 in.) from the outer surface of the enclosure.

Substantiation: The text accepted by the panel continues to create concern for manufacturers of equipment enclosures. This comment is to fix two significant areas of concern:

1) The addition of “intended” to the panel text is to make it clear that there may be openings that are there, but not necessarily used as part of that particular installation. A good example is drainage openings in a 3R enclosure that is installed indoors. Clearly the openings are there, but they are not used in that application. Another example is mounting holes that are in the back of the enclosure, but are not used because the enclosure is mounted from its side.

2) The new words “or permitted as part of the design for listed equipment” is intended to address a conflict that is created by the proposed wording and the product standards. For example, UL-50 – Standard for Enclosures has specific allowances for additional (albeit small) openings in an enclosure. These openings may have been necessary for the manufacturing process (such as drain openings for paint during the painting process) and have no application in the final use of the product.

It is important that this language be adjusted to avoid contractors having to fill in ways to fill openings that were intended by design and by allowance in the product standard to remain open.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Explanation of Negative:

MCMahill, L.: I concur with CMP-1’s action; however, to simplify the section it may have been appropriate to say, “Unused openings, other than those intended for operation or mounting purpose, or those permitted as part of the design of the equipment, shall be closed.”

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Rejection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12
current would be a fruitless task, as the fault current could change before the equipment is energized. This would render the new equipment unsafe from the outset. As Mr. Floyd stated in his comment to the affirmative, there are “other approaches” that may be more useful. By including the date on the marking requirement, would aid the installer/maintainer in making the proper choices as they enter into the equipment. As I stated in my substantiation on Proposal 1-85, “clearly, labels would need to be updated when changes are made in the system”.

Panel Meeting Action: Reject
Panel Statement: The Panel reaffirms its statement on Proposal 1-85. Available fault current is necessary but not all the information needed to establish PPE levels.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
HICKMAN, P.: See our explanation of negative vote on Comment 1-52.

Ballot Results: Affirmative: 11 Negative: 1

Submitter: C. E. Gibson, III, Lawson Electric Company Inc.

Comment on Proposal No: 1-85
Recommmendation: Revise proposed 110.16 to read:
Switchboards, panelboards, industrial control panels, meter socket enclosures and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential electric arc hazards. The marking shall indicate the available fault current. The marking shall be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

Substantiation: This proposal should have been Accepted in Part. While I agree somewhat that the marking of the shock protection boundary and arc flash protection boundary would be more of an electrically related safe work practice suited more for NFPA 70E, the marking of the available fault current is absolutely necessary for proper compliance with 110.9 and 110.10. In addition, we strongly disagree with the panel reaffirming its statement on Proposal 1-85. We submit that the statement “marking of the equipment with actual fault current would be misleading” is not accurate. We recognize the actual fault current is not fixed. The industry simply cannot continue to hide behind this argument and not move to help inspectors, electricians, and others who maintain and install electrical equipment.

The concept recommended here in this comment is simply asking for documentation of something that has been required by the NEC for a number of years and a crucial component of information necessary to help protect workers from arc flash and arc blast.

Comment on Affirmative:
FLOYD, H.: I am in support of the concept of providing more information to people who are at risk of exposure to arc flash hazards; however, there are other approaches that may be more useful in that they are less dependent on variations in available short circuit current. For example, if the label were to indicate the performance rating of personal protective equipment required, it could be specified to cover anticipated variations in the available short circuit current.

1-53 Log #788 NEC-P01 Final Action: Reject (110.16)

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 1-82
Recommendation: Reject this Proposal.

Substantiation: Both the submitter’s language and that accepted by the panel is unnecessary. The current text of the NEC exempts the equipment in the dwelling occupancy. Even in a multi-family family, where the wiring is done within the occupancy itself is not a significant arc flash concern. The current NEC language would still apply the requirement to the service equipment (meter center, switchboard, etc.) that supplies the dwelling unit panelboards. Although many panelboards used even in dwelling units already have a marking that warns against an arc flash hazard. Adding a specific requirement to this section could encourage some AHJs to require a separate and distinct label on the front of the enclosure. Given that these are often installed in the living space, we are simply inviting the resident to paint over the label or remove it because of the unpleasant aesthetics. The label adds no value in these applications.

Panel Meeting Action: Accept
Panel Statement: The panel does not necessarily agree with all of the submitters substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
HICKMAN, P.: See our explanation of negative vote on Comment 1-52.

1-54 Log #835 NEC-P01 Final Action: Accept (110.16)

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 1-82
Recommendation: Reject this Proposal.

Substantiation: The concept recommended here in this comment is simply asking for documentation of something that has been required by the NEC for a number of years and a crucial component of information necessary to help protect workers from arc flash and arc blast.

Comment on Affirmative:
FLOYD, H.: I am in support of the concept of providing more information to people who are at risk of exposure to arc flash hazards; however, there are other approaches that may be more useful in that they are less dependent on variations in available short circuit current. For example, if the label were to indicate the performance rating of personal protective equipment required, it could be specified to cover anticipated variations in the available short circuit current.

Report on Comments A2007 — Copyright, NFPA

1-55 Log #836 NEC-P01 Final Action: Accept (110.16)

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 1-84
Recommendation: Reject this Proposal.

Substantiation: The panel needs to reconsider the words that expand this to an infinite list. Mr. Minick’s comments are correct that the addition actually makes the section more ambiguous. NEC 110.16 has accomplished its original intended goal which was to increase the awareness and understanding of the arc flash hazard. The existing list of equipment does provide the most likely products where the hazard will be present. However, as pointed out by Mr. Minick, should the 30A GD switch installed in a barn really have an arc flash marking by itself?

The panel should also be aware that some manufacturers have integrated arc flash into their normal warning labels on products. This increases the needed awareness and does so without a burden on the installing contractor or user. Leave 110.16 as it is and allow it to continue to do the job of increasing awareness.

Panel Meeting Action: Reject
Panel Statement: CMP-1 disagrees that the revised text expands the list to “an infinite list” and that it “actually makes the section more ambiguous.” The text uses the words “such as” to give examples of what equipment requires the arc flash marking. A 30A General Duty switch installed in a barn is not such equipment. Without such change, the NEC currently worded has no requirement to mark an 800A fusible switch mounted on a wall.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

70-22
Protection boundaries are outside the scope of 0.6. However, the Panel may wish to reconsider its position relative to not marking the incident energy and flash protection boundary. It is agreed that the available short-circuit current will and does change with time, and that translates into a change in the incident energy and arc-flash boundary. But, isn’t it better and safer to provide the electrical worker with the values at some point in time than to provide nothing at all. If you were an electrical worker that was called out at 2:00 AM to get a motor control center back up and running, wouldn’t you like to know the incident energy and arc-flash boundary, even if it was calculated several years ago. If there is no marking on the equipment, the electrical worker is left with nothing but the tables in NFPA 70E, and they have to know the available short-circuit current and opening time of the upstream overcurrent protective device in order to apply the tables. At 2:00 AM, you are not going to be able to find the available short circuit and opening time of the overcurrent protective device. You need to take some voltage measurements. What do you do? Now, if the MCC was marked with the incident energy and flash protection boundary, even though it was obtained years before, you have a basis to make an intelligent decision. Yes, you are taking a risk that the fault current may have gone up or down and that the incident energy and flash protection boundary may have increased, but you are certainly better off than not knowing anything about the hazard level that exists. I urge the panel to pass this one for the safety of the electrical workers that are putting their health and lives at risk while most of the rest of the country sleeps.

Panel Meeting Action: Reject
Panel Statement: What the submitter is proposing is a work practice issue. Such information does not belong in an installation code. More appropriately, it belongs in NFPA 70E - Standard for Electrical Safety in the Workplace. Additionally, the incident energy and flash protection boundary should be determined prior to working on or near energized electrical equipment.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 1 Negative: 1

Comment on Proposal No: 1-85
Submitter: Vincent J. Saporita, Cooper Bussmann
Recommendation: Remove the requirement for marking the shock protection boundary, and make minor changes to the wording. Replace the original proposed wording with:

The marking shall additionally indicate the incident energy and the flash protection boundary.

Substantiation: The Panel was correct in its statement that the shock protection boundaries are outside the scope of 110.16. However, the Panel may wish to reconsider its position relative to not marking the incident energy and arc-flash boundary. It is agreed that the available short-circuit current will and does change with time, and that translates into a change in the incident energy and arc-flash boundary. But, isn’t it better and safer to provide the electrical worker with the values at some point in time than to provide nothing at all. If you were an electrical worker that was called out at 2:00 AM to get a motor control center back up and running, wouldn’t you like to know the incident energy and arc-flash boundary, even if it was calculated several years ago. If there is no marking on the equipment, the electrical worker is left with nothing but the tables in NFPA 70E, and they have to know the available short-circuit current and opening time of the upstream overcurrent protective device in order to apply the tables. At 2:00 AM, you are not going to be able to find the available short circuit and opening time of the overcurrent protective device. You need to take some voltage measurements. What do you do? Now, if the MCC was marked with the incident energy and flash protection boundary, even though it was obtained years before, you have a basis to make an intelligent decision. Yes, you are taking a risk that the fault current may have gone up or down and that the incident energy and flash protection boundary may have increased, but you are certainly better off than not knowing anything about the hazard level that exists. I urge the panel to pass this one for the safety of the electrical workers that are putting their health and lives at risk while most of the rest of the country sleeps.

Panel Meeting Action: Reject
Panel Statement: What the submitter is proposing is a work practice issue. Such information does not belong in an installation code. More appropriately, it belongs in NFPA 70E - Standard for Electrical Safety in the Workplace. Additionally, the incident energy and flash protection boundary should be determined prior to working on or near energized electrical equipment.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 1 Negative: 1

Comment on Negative:
HICKMAN, P.: See our explanation of negative vote on Comment -52.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 1-60.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-62 Log #299 NEC-P01 Final Action: Accept in Principle (110.20 (New ))
Submitter: Code-Making Panel 11, Comment on Proposal No: 1-95
Recommendation: Continue to Accept Proposal 1-95.
Substantiation: It was the action of the Technical Coordinating Committee that Proposal 1-95 be referred to CMP-11 for comment. This comment is the result of that request. CMP-11 supports the acceptance of Proposal 1-95. It appropriately provides requirements for all types of enclosures, not just for motor controller enclosures as is currently found in 430.91. Proposal 11-55, a companion proposal which deletes similar requirements, as they apply specifically to motor controller enclosures, was passed by a vote of 15 to 0 by CMP-11.
This comment has been balloted through CMP-11 with the following ballot results:
15 Eligible to Vote
14 Affirmative
1 Not Returned (R. Widup)
Mr. J. Caccamese voted affirmatively stating: “See my Affirmative Comment on CMP-11’s Comment on Proposal 1-61.”
Panel Meeting Action: Accept in Principle
Panel Statement: Not addressed in the panel action and statement on Comment 1-65.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-63 Log #309 NEC-P01 Final Action: Reject (110.20 (New ))
Submitter: Code-Making Panel 9, Comment on Proposal No: 1-95
Recommendation: Make the following changes in the panel action text:
1. Locate the new table in Chapter 9, perhaps using the now unused position of Table 3. If this is accepted, the FPN in 110.11 as revised by Proposal 1-61 will need to be correlated.
2. Change the note to the Table to read as follows:
Table 3 was intended to provide the basis for selecting the above enclosures for use in certain equipment for which specific protection from various environmental conditions is required in other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, corrosion, or contamination that may occur within the enclosure or enter via the conduit or unsealed openings.
FPN: The term raintight is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 6, and 6P. The term rainproof is typically used in conjunction with Enclosure Types 3R and 3RX. The term watertight is typically used in conjunction with Enclosure Types 4, 4X, 6, and 6P. The term drip tight is typically used in conjunction with Enclosure Types 2, 5, 12, 12K, and 13. The term dusttight is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 5, 12, 12K, 13.
3. Relocate the requirement as 110.28, as follows:
110.28 Enclosure Types, Not Over 600 Volts, Nominal. Enclosures of all switchboards, panelboards, industrial control panels, meter sockets, motor control centers, enclosed switches, enclosed circuit breakers, transformers, motor controllers, and other equipment enclosures required to be identified as being suitable for the specific environmental conditions that apply at their location, shall be marked with a type number marked on the enclosure by their manufacturer in accordance with Table 3 in Chapter 9.
4. Revise the “Notes to Tables” located after Chapter 9, Table 1 to read:
“Notes to Tables 1, 4, 5, and 5A.”
Substantiation: This comment raises issues presented in the CMP-9 Proposal 1-94 that were not addressed in the panel action to accept in principle. CMP-9 respectfully requests that CMP-1 revisit the technical issues raised in its proposal, as follows:
1. The Chapter 9 location has the virtue of being immune from the Chapter 5 modification provisions of 90.3. This will then allow the inclusion of NEMA 7, 8, and 9 enclosure future code cycle, providing a single location for all the enclosure types, which would be very useful for code users. In fact, this location could also include IEC ingress protection tables as well.
2. To correlate with this suggested location, the operational text has been modified to say, “for which specific protection from various environmental conditions is required”. This wording allows the various code making panels to decide whether to implicitly (or explicitly) reference the new table in the future. In addition, this comment retains the present FPN to Table 430.91 that appears to have been omitted in the CMP-1 action on this proposal, although it may be in the portion of the table that apparently truncated due to possible processing error in the Report on Proposals.

I-65 Log #1513 NEC-P01 Final Action: Accept in Principle (110.20 (New ))
Submitter: James Wiseman, Schneider Electric / Square D
Comment on Proposal No: 1-95
Recommendation: The Panel should continue to accept Proposal 1-95 and its companion proposals.
Substantiation: Having the enclosure requirements in a general application area of the Code, rather than in 430.91, and specifically stating the kinds of equipment to which they apply will greatly improve usability.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 1-114. The panel accepts the relocation of the table and the text with the inclusion of the revisions noted in comment 1-114.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-67 Log #976 NEC-P01 Final Action: Accept in Principle in Part (110.20 (New ))
Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 1-95
Recommendation: Revise text to read as follows:
110.20 Enclosure Types. Enclosures (other than surrounding fences or walls) of switchboards, panelboards, industrial control panels, motor control centers, meter sockets, and motor controllers, rated not over 600 volts nominal and intended for such locations, shall be marked with an Enclosure Type number as shown in Table 0.20.
Table 0.20 provides the basis shall be used for selecting the above enclosures for use in specific locations, other than hazardous (classified) locations. The enclosures are not be intended to protect against conditions such as condensation, icing, or contamination that may occur within the enclosure or enter via the conduit or unsealed openings.
Substantiation: The accepted text in the proposal does not comply with the NEC Style Manual and Section 90.5(A) to use mandatory language. The suggested text in this comment will provide the mandatory text necessary to comply with 90.5(A) and the NEC Style Manual.
Panel Meeting Action: Accept in Principle in Part
The panel accepts the change to the 1st sentence of the second paragraph, but rejects the change to the 2nd sentence. The panel accepts in principle aligning the text with the NEC Style manual so that the paragraph reads:
Table 110.20 shall be used for selecting enclosures for use in specific locations other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, or contamination that may occur within the enclosure or enter via the conduit or unsealed openings.
Panel Statement: In accordance with the NEC Style Manual, Section 3.1.1, CMP-1 concurs with the submitter that using the mandatory code language “shall be used” in lieu of “provides the basis” is appropriate. CMP-1, however, disagrees with changing the words “are not intended” to “shall not be intended.” In the context of the sentence, there is no need for this sentence to be written as mandatory code language. CMP-1 has also removed the words “the above” as they are unnecessary and in violation of NEC Style Manual, Section 3.3.4 – Word Clarity.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

3. The requirement relocation to Section 28 moves the rule from the general part of the article, which might be interpreted to apply over 600 volts, to Part II of the article that only applies to 600V and below systems. This is the appropriate location based on the actual text of the rule. In addition, the text suggested here includes other enclosures for which the type designation is routinely applied, and for which no substantiation was provided to omit.
4. The Final Action suggested in this comment corrects an error in the present Chapter 9 table notes that only became worse after the inclusion of the new Table 2 in the 2005 cycle.
This comment has been balloted through CMP-9 with the following ballot results:
11 Eligible to Vote
10 Affirmative
1 Not Returned (H. deVega)
Panel Meeting Action: Reject
Panel Statement: The Panel concludes that the proposed table should be included in Article 110 to enhance usability. The reasons expressed in the Comment to relocate the table to Chapter 9 while retaining the requirement in Article 110 are not persuasive.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
1-66 Log #1097 NEC-P01  (110.21) Final Action: Reject
Submitter: Michael Thibeau, Bear Electric

Comment on Proposal No: 1-96
Recommendation: Revise text to read as follows:
(a) Minimum Space. Switchboards, panel boards, disconnects, panels, meter
enclosures, and any electrical cabinet or, enclosure that may require any
examination, adjustment, service, or repair maintenance shall be field marked:
[Warning: minimum (x) ft. clearance required by NEC code] (x) shall be
derived from table 110.26(A)(1). Field marking shall not be required if the
equipment is accessible only to qualified personnel.

Substantiation: This submission was edited to more fully comply with the style
manual, specifically 2.1.5.2, 3.2.4, and 3.3.5. I also completely agree
with the submitter, Donald Wies that this simple signagewould of significant
benefit. I believe that although many unqualified persons may be aware of
electrical hazards, many are unaware of the space requirements set forth in
110.26 not only in dwelling units but commercial/retail spaces as well. This
will not only serve as a deterrent towards encroaching miscellaneous storage,
but also as a reminder to other tradesmen making installations around electrical
equipment about NEC space requirements. In one instance, an oil tank was
installed directly in front of a panel that needed to be worked on.

Panel Meeting Action: Rejec
Panel Statement: The Panel reafirms its statement on Proposal 1-96 as the
comment does not provide any additional information to address the Panel's
expressed concern.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
ANTHONY, M.: We agree with the substantiation presented by Mr. Hickman
in the proposal stage. We do not want to “oversign” an already oversized
world but we need something to keep stuff in front of electrical panels. The
proposed marking would serve as a deterrent to unqualified persons and an
important reminder to qualified persons.
HICKMAN, P.: We are voting negative to the panel action to reject Comment
1-66. Our explanation is as follows: We do not necessarily agree with the panel
statement on Comment 1-66 which reaffirms its panel statement on Proposal
1-96. We still maintain the proposed marking would serve as a deterrent to
unqualified persons and we do not agree with the panel statement which states:
“such marking would be of little benefit.”

1-67 Log #1001 NEC-P01  (110.21(A)) Final Action: Reject
Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: 1-96
Recommendation: Accept, but add:
Infringement on this working space could endanger workers requiring clear
access to the equipment.
Substantiation: Mr. Weiss is correct that this requirement would prevent costly
mistakes and even deaths. What the CMP asserts in rejecting the proposal
is puzzling. By definition of “qualified,” a qualified person would know the
rule, but there are a great many more non-qualified working around electrical
equipment, and some of them do heed signs. Otherwise, why would we bother
with “Danger! Shock hazard-keep out.”?

Panel Meeting Action: Reje
Panel Statement: See panel action and statement on Comment 1-66.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
HICKMAN, P.: See our explanation of negative vote on Comment 1-66.

1-68 Log #1002 NEC-P01  (110.21(A)) Final Action: Reject
Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: 1-96
Recommendation: Accept.
Substantiation: Mr. Weiss is correct that this requirement would prevent costly
mistakes and even deaths. What the CMP asserts in rejecting the proposal
is puzzling. By definition of “qualified,” a qualified person would know the
rule, but there are a great many more non-qualified working around electrical
equipment, and some of them do heed signs. Otherwise, why would we bother
with “Danger! Shock hazard-keep out.”?

Panel Meeting Action: Reje
Panel Statement: See panel action and statement on Comment 1-66.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
HICKMAN, P.: See our explanation of negative vote on Comment 1-66.

1-69 Log #269 NEC-P01  (110.22) Final Action: Accept in Principle
Submitter: John D. Minick, Grand Prairie, TX

Comment on Proposal No: 1-98
Recommendation: Revise Proposal 1-98 as accepted by Code-Making Panel 1
as shown below:

110.22 Identification of Disconnecting Means.
(A) General. Each disconnecting means shall be legibly marked to indicate its
purpose unless located and arranged so the purpose is evident. The marking
shall be of sufficient durability to withstand the environment involved.

(B) Engineered Series Combination Systems. Where circuit breakers or
fuses are applied in compliance with the series combination ratings selected
under engineering supervision and marked on the equipment as directed by
the engineer, the equipment enclosure(s) shall be legibly marked in the field to
indicate the equipment has been applied with a series combination rating. The
marking shall be readily visible and state the following:
CAUTION — ENGINEERED SERIES COMBINATION SYSTEM
RATED ____ AMPERES. IDENTIFIED REPLACEMENT COMPONENTS
REQUIRED.
FPN: See 240.86(A) for interrupting rating marking for end use equipment
requirements for Engineered Series Combination Systems.

(C) Tested Series Combination Systems. Where circuit breakers or fuses
are applied in compliance with the series combination ratings marked on
the equipment by the manufacturer, the equipment enclosure(s) shall be
legibly marked in the field to indicate the equipment has been applied with a
series combination rating. The marking shall be readily visible and state the
following:
CAUTION — SERIES COMBINATION SYSTEM RATED
AMPERES. IDENTIFIED REPLACEMENT COMPONENTS
REQUIRED.
FPN: See 240.86(B) for interrupting rating marking for end use equipment
requirements for Tested Series Combination Systems.

Substantiation: This Comment was developed by a Task Group of CMP-1
members while reviewing actions taken by CMP-10 on Proposal 10-52, which
was referred to CMP-1 by CMP-10. Members of the Task Group included
Louis Barrios, Jr., Kenneth Boyce, Mark Christian, Neil LaBrake, Lanny
McMahl, Gil Moniz, and John Minick. The developed Comment to CMP-10
states CMP-1 agrees that markings are required for Engineered Series
Combination Systems (240.86(A)). However the specifics of the marking should appear in 110.22 that already contains marking
requirements for Tested Combinations (240.86(B)). CMP-1 considers that
Proposal 1-98 as modified by this comment meets the intent of 10-52 relative to
specific markings associated with 240.86(A). Additionally, CMP-1 suggested
that CMP-10 add a FPN to 240.86 that would state -FPN: See 110.22 for marking requirements for Series Combination Systems.
The added (A), (B), (C) paragraph style proposed as a revision to the
accepted Proposal 1-98 is intended to separate and clarify the three main
requirements contained in 110.22. The revision of the fine print notes accepted by
CMP-1 in Proposal 1-98 are necessary in that the current fine print notes
appear to reference markings in 240.86 and that may in fact confuse NEC
users.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 1-70.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

1-70 Log #350 NEC-P01  (110.22) Final Action: Accept
Submitter: Code-Making Panel 10,
Comment on Proposal No: 1-98
Recommendation: This proposal should be Accepted in Principle, and
marked as follows:
110.22 Identification of Disconnecting Means.
(A) General. Each disconnecting means shall be legibly marked to indicate its
purpose unless located and arranged so the purpose is evident. The marking
shall be of sufficient durability to withstand the environment involved.

(B) Engineered Series Combination Systems. Where circuit breakers or fuses
are applied in compliance with the series combination ratings selected under
engineering supervision and marked on the equipment as directed by
the engineer, the equipment enclosure(s) shall be legibly marked in the field to
indicate the equipment has been applied with a series combination rating. The
marking shall be readily visible and state the following:
CAUTION — ENGINEERED SERIES COMBINATION SYSTEM RATED
AMPERES IDENTIFIED REPLACEMENT COMPONENTS REQUIRED.
FPN: See 240.86(A) for Engineered Series Combination systems.
(C) Tested Series Combination Systems. Where circuit breakers or fuses are applied in compliance with the series combination ratings marked on the equipment by the manufacturer, the equipment enclosure(s) shall be legibly marked in the field to indicate the equipment has been applied with a series combination rating. The marking shall be readily visible and state the following:

CAUTION — SERIES COMBINATION SYSTEM RATED
AMPERES IDENTIFIED REPLACEMENT COMPONENTS REQUIRED.
FPN: See 240.86(B) for Tested Series Combination Systems.

Substantiation: This comment was developed by a task group comprised of the following members of CMP-10 James Dollard, Chair; Charles Blizzard; Dennis Darling; Charles Eldridge; Carl Fredericks; Clive Kimblin; John Kovacik; Frank Ladonne; George Ockuly; Gerald Williams; Alan Manche and Vince Saporita.

This proposed revision is modeled after the preliminary work of a CMP-1 Task Group developing a comment on Proposal 1-98.

The intent of the submitter is met in this revision. In order to improve clarity and usability, the proposed revision of the requirements of 110.22 are separated into three first level subdivisions. The existing requirements of 110.22 as seen in the 2005 NEC are editorially separated into two first level subdivisions titled, “(A) General” and “(C) Tested Series Combination Systems.” The proposed additional text accepted in Proposal 1-98 by CMP-1 is editorially placed in first level subdivision titled “(B) Engineered Series Combination Systems.” This separation of requirements provides additional clarity, is user friendly, and in compliance with the NEC Manual of Style.

The Fine Print Note referencing 240.86(A) as accepted by CMP-1 in Proposal 1-98 has been modified to provide additional clarity. The revised FPN does not contain a requirement and is in compliance with the NEC Manual of Style. The existing FPN which is editorially moved to a new first level subdivision 110.22(C) has been modified for consistency with the proposed FPN in a new first level subdivision 110.22(B).

Requirements for marking of engineered series rated systems should be found in the same place as those for tested series rated systems. As such, they should be located in 110.22, not Article 240. CMP-10 considers that Proposal 1-98, as modified by this comment meets the intent of Proposal 10-52 relative to specific markings associated with 240.86(A).

This comment was balloted through CMP-10 with the following ballot results:
12 Eligible to Vote
11 Affirmative
1 Not Returned (R. Sobel)

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-72 Log #1003 NEC-P01
Final Action: Reject
(110.26 (New))

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing
Comment on Proposal No: 1-103
Recommendation: Accept as written.
Substantiation: The CMP's comments appear to overlook a special characteristic of many metering devices. Utility meters most commonly serve as customer demarcation points, remaining under utility control. At least in part because of this, the utility, not the AHJ, approves the location of the meter can. Then electricians-our peers-as well as lineworkers need access after these are energized, for instance when performing service changes.

Panel Meeting Action: Reject
Panel Statement: Working space is required about all electrical equipment. Clearly this includes "metering devices".
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-71 Log #167 NEC-P01
Final Action: Accept in Principle
(110.25 (New))

TCC Action: The Technical Correlating Committee understands that the panel action deletes the last sentence in the opening paragraph of 110.26 and adds a new 110.26(G).
Submitter: Phil Simmons, Olympia, WA
Comment on Proposal No: 1-100
Recommendation: Delete the last sentence of 110.26 opening paragraph and create a new 110.25 (or other appropriate location) with the concepts included in the existing rule.
110.25 Locked Rooms or Equipment. Rooms or enclosures housing containing overcurrent protective devices and enclosures for overcurrent protective devices or disconnecting means shall be permitted to be locked provided those to whom access is necessary have a key or other means to open the lock(s) and the key or keys shall be considered accessible to qualified persons.

Panel member Mr.McMahill states in his negative vote, “The proposal should have been accepted as the submitter’s substantiation justifies deletion of the text. I agree with the submitter that this sentence does not belong in this section and removing it will improve usability of the code. The panel statement notes that, “The submitter has not provided adequate technical substantiation that a problem exists.” I believe the submitter has provided reasonable substantiation for the change. Section 110.26 addresses “Spaces About Electrical Equipment.” A lock and key has nothing to do with these spaces. The sentence more appropriately belongs somewhere else in the code. At the minimum, CMP-1 should have accepted the proposed deletion of the sentence contingent on CMP-4 and 10’s positive action on the submitter’s companion proposals. CMP-1 should reconsider the action on this proposal.” I agree with Panel member Mr.McMahill!

For this sentence to a new and appropriate location will not introduce a new concept not covered in the NEC, but will improve the organization and user-friendliness of the Code.

Panel Meeting Action: Accept in Principle
Create new section 110.26 (G) that reads:
110.26 (G) Locked Electrical Equipment Rooms or Enclosures. Electrical equipment rooms or enclosures housing electrical apparatus that are controlled by a lock(s) shall be considered accessible to qualified persons.

Panel Statement: CMP-1 accepts the recommendation to delete the text from Section 110.26 regarding “Enclosures housing electrical apparatus that are controlled by a lock(s)”...” and create a new section 110.26(G). CMP-1 has created a new title for 110.26(G) - Locked Electrical Equipment Rooms or Enclosures. The deleted text from Section 110.26(A) has been relocated to this new section and slightly modified for clarity of the intent.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-73 Log #2200 NEC-P01
Final Action: Reject
(110.26 (New))

Comment on Proposal No: 1-101
Recommendation: Accept the Proposal. New Text from ROP is repeated here:
1-101 Log #3082 NEC-P01 Final Action: Reject
(110.26)

Recommendation: Add text to read as follows:
11 0.26(D) (NEW) Emergency Illumination. The area around all service panels in non-dwelling unit occupancies 200 amperes and above shall be automatically illuminated upon loss of power. For a period of 90 minute illumination levels shall be
1) One footcandle (1-fc) along the floor to the established building emergency egress path.
2) Two footcandles (2-fc) at all vertical surfaces where surface switchgear, permanent service directory, emergency transfer switches, or standby power switches are located.

Substantiation: Proposal 1-101, Log #3801 should be accepted. This proposal aligns with the work of the panel that crafted new Article 585 (Critical Operations Power Systems) because it a necessary part of the foundation we are building for power security. It should be intuitively understood that emergency lighting is needed at the electric service equipment in order for an electrical professional—or non-electrical professional—to at least determine the nature of the outage and take appropriate action.

Some NEC requirements ought to come from gut-level understanding that emergency lighting at the service equipment is important enough that it should not lie in the gap in coverage of the Life Safety Code (typically enforced by the local fire marshal) and the electrical inspector enforcing the National Electric
7.8.1 General.

7.8.1.1* Illumination of means of egress shall be provided in accordance with Section 7.8 for every building and structure where required in Chapter 11 through Chapter 42.

The Life Safety Code is silent over the issue of whether service equipment needs to be on the egress entry, egress path, or egress exit. The Life Safety Code fails to assure that the path to or from the electric service equipment is obvious and direct. (I acknowledge the hidden assumption that transfer equipment is located near the service point) Good engineers and architects can, and should, provide for such illumination in the design stage but a large class of electrical service equipment areas are not guided by designers. Even with good designers on the job the concept of “ingress toward the electric service equipment” doesn’t even seem to show up between the lines of the Life Safety Code. The equivalency of ingress (or partial ingress), as the reverse of egress, for example, may not be assured.

7.9.2.3* The emergency lighting system shall be arranged to provide the required illumination automatically in the event of any interruption of normal lighting due to any of the following:

1. Failure of a public utility or other outside electrical power supply
2. Opening of a circuit breaker or fuse
3. Manual act(s), including accidental opening of a switch controlling normal lighting facilities

Note that the only facility classes that explicitly require illumination at anything resembling the service point, are storage and detention facilities.

22.5.1.2 Alarms, emergency communications systems, and the illumination of generator set locations shall be provided with emergency power in accordance with NFPA 70, National Electrical Code.

From this sample of passages it should be plain that, without an explicit requirement for emergency illumination at the service equipment as a Chapter 1 general requirement, we put the Fire Marshall and the Electrical Inspector in a position where each looks to the other as the person responsible for verifying that the installation meets service equipment emergency lighting requirements that do not now exist. Getting this language into the NEC, or a version of it that matches its intent, will change that.

We should take comfort in the fact that mounting a spec grade emergency lighting unit and pointing its beam at the service equipment can cost as little as $100—installed. While it is true that loss data has not been presented to the committee, the lack of hard data accompanying this proposal is not much different than the lack of data presented to the committee governing the controversial selectivity requirements in Articles 700 and 701. A great deal of the NEC has come down to us from uncounted, unclassified experience. We should let common sense be the guide in the acceptance of Proposal 1-101. It’s a start.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its statement on Proposal 1-101. The panel recommends that the submittor submit this proposal to the NFPA 101 & 5000 committees. The panel notes that what the submittor is suggesting is not prohibited by the NEC.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:

ANTHONY, M.: I appreciate the respectful discussion of this issue by my colleagues on Panel 1 at the December 2006 ROC panel meeting. Perhaps this proposal is one of many that are presented to NEC committees that take a while “getting used to” or may be too far ahead of its time. Nevertheless, I maintain that emergency illumination for service switchgear—especially switchgear that controls emergency power—should be a general requirement for electrical installations; much as working/clearance/dedicated space, and panic hardware is a general requirement. Electrical people should be looking after their own in this regard; not leaving the issue to the architectural trades that dominate the code panels in the Life Safety Code.
Submitter: Jim Pauley, Square D Company

Proposal on Comment No: 1-111

Recommendation: Continue to reject the proposal.

Substantiation: Although this proposal was rejected by a significant margin, the comments on voting deserve some additional explanation. The problem with using the term “dead energized” introduces explicitly the issue that existed in 1999 NEC. You must read the wording carefully because using that term stated “de-energized parts on the back of enclosed equipment”. Nobody could explain what a de-energized part would be that is ON the back of a piece of equipment. The panel was correct to change the wording to “non-electrical”. A couple of examples of what may be included in this wording are items such as filters for air circulation systems that are part of the equipment or a transformer throat connection that needs some mechanical (not electrical) work.

Furthermore, if the expectation was for de-energized parts then you may still need the space in order to verify that these are “de-energized” as pointed out by Mr. Barrios. The 30” provision allows for reduced space to allow access and perform work that is not related to the electrical aspects of the equipment.

Mr. Barrios is correct that the way to resolve the inconsistency is to fix 110.34(A) exception to match 110.26.

Panel Meeting Action: Accept

Panel Statement: The panel does not necessarily agree with all of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: MCMAHILL, L.: Code-Making Panel 1 should have reverted back to the original code language to mirror the requirements of 110.34, Exception. The term “de-energized” has been long standing in the code with no reports of problems or concerns. Use of the term “non-electrical” now requires a judgment call on the part of the AHJ to determine if working space is or is not required for rear access. De-energized terminals on the rear of a switchboard generally do not require examination, adjustment, servicing, or maintenance while energized. Therefore, is working space per 110.26(A) required, or does compliance with 110.26 apply. Spaces About Electrical Equipment, surface? The term non-electrical is vague and unenforceable code language. This change now requires a minimum horizontal working space on the back of enclosed equipment for non-electrical parts, yet requires no minimum working space for electrical parts. It is more appropriate to require a minimum horizontal working space for deenergized electrical parts not likely to require examination, adjustment, servicing, or maintenance while energized, than for non-electrical parts.

I-76 Log #837 NEC-P01

Final Action: Accept

(110.26(A)(1)(a))

Submitter: Michael Walls, American Chemistry Council

Proposal on Comment No: 1-111

Recommendation: Modify 110.34(A) Exception as shown below.

110.34 Work Space and Guarding.

(A) Working Space. Except as elsewhere required or permitted in this Code, the minimum clear working space in the direction of access to live parts of electrical equipment shall not be less than specified in Table 110.34(A). Distances shall be measured from the live parts, if such are exposed, or from the enclosure front or opening if such are enclosed.

Exception: Working space shall not be required in back of equipment such as dead-front switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on non-electrical de-energized parts on the back of enclosed equipment, a minimum working space of 750 mm (30 in.) horizontally shall be provided.

Substantiation: The panel action should continue to be Reject on Proposal 1-111 because Condition 1, 2, or 3 working clearances may still be needed on de-energized equipment for tasks such as testing for the absence of voltage as noted in Mr. Barrios’ ballot comment, exception. Also as noted in Mr. Barrios’ ballot comment, “de-energized parts” in 110.34(A) Exception should be changed to “non-electrical parts” in 110.26(A)(1)(a) and 110.34(A) are consistent. Failure to modify 110.34(A) will continue the inconsistency between the low voltage and medium voltage clearance requirements behind dead front equipment for another code cycle. This action should be considered as new material since the proposed changes in 110.34(A) Exception appeared in the ROP.

Panel Meeting Action: Hold

Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

I-78 Log #835 NEC-P01

Final Action: Reject

(110.26(A)(3))

Submitter: Robert G. Fahey, City of Evansville

Proposal on Comment No: 1-116

Recommendation: I would support the new wording proposed for this section as proposed in NEC Proposal 1-115 (Log #1892).

Substantiation: I am not aware of any incidents where a worker has been hurt while working on a stairs on an uneven floor. As an electrical inspector, it is very apparent to me it would be very easy to lose your balance while working on a panelboard located on a stair tread or uneven surface. I would doubt if any electrician in my area would take the time to build a level platform in order to work on the equipment. Providing a level working area in front of electrical equipment will enhance the safety of the installation, allowing an uneven area created by steps in front of electrical equipment provides an unsafe workplace. As the NEC is presently written, new electrical panelboards are allowed to be installed in these unsafe areas, there would typically be minimal or no additional cost to install these panelboards in a safe, level work space, this might save an electrician from being injured or shocked sometime in the future. I inspected an installation where the panelboard was installed on a stairway and found it to be unfortunate that the National Electrical Code did not prohibit this type of unsafe installation. I would encourage the Code Panel to look at this additional sentence and embrace this as another step in making it safer for workers who must be in some instances (actually many instances) work on this equipment energized. This would, in my mind, be logical move forward in creating a safer work area for all electricians and maintenance personnel.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its statement on Proposal 1-115. The panel understands that this comment is in reference to proposal 1-115 rather than the linked proposal 1-116.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Substantiation: Barrios’ ballot comment, “de-energized parts” to “non-electrical parts” in the 110.34(A) Exception in order to make the requirements the same for LV and MV equipment. I also made this recommendation in my affirmative ballot comment on Proposal 1-111 in the 2008 ROP. Since similar language appears in the ROP, the proposed change has had public review and should not have been considered new material.

The submitter of Comment 1-77 acknowledged the proposed change in my ROP comment by stating “Mr. Barrios is correct that the way to resolve the inconsistency is to fix the 110.34(A) Exception to match 110.26.” The submitter should accept this comment that would modify the text to make the requirements in 110.26(A)(1)(a) and 110.34(A) consistent.

I-79 Log #835 NEC-P01

Final Action: Accept

(110.26(A)(3))

Submitter: Technical Correlating Committee on National Electrical Code

Proposal on Comment No: 1-117

Recommendation: The Technical Correlating Committee directs the panel to reconsider their action related to the necessity of a soft conversion. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the TCC’s direction to reconsider action on Proposal -17. As 90.9(D) states that compliance with either SI measurements or inch-pound measurements shall constitute compliance with NEC, and 6 inches is a greater distance than 150 mm, 90.9(C)(4) would not apply. The panel concludes that the use of 150mm is appropriate.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12
I-80 Log #1404 NEC-P01
(110.26(A)(3))

Submitter: Noel Williams, Noel Williams Consulting

Comment on Proposal No: 1-116

Recommendation: Revise text to read as follows:

This proposal should have been accepted. Alternatively the proposal should have been accepted in principal with the wording changed to read "...the height required by 110.26(E) or to the top of the equipment and not less than 2.0 m (6-1/2 ft) where a minimum height is not specified by 110.26(E)."

Substantiation: According to the panel statement, "the submitter’s intent is met by the reference to 110.26(E) height requirement in 110.26(A)." This is false. The submitter’s intent is not met by the existing language of 110.26(E). It may be true that the panel’s intent is met by this reference, however, that would mean that the panel’s intent is that there would be no minimum height requirement for equipment such as safety switches, combination motor controllers, control panels, or the like, since 110.26(E) does not provide a height requirement for such equipment. 110.26(A)(3) says the height shall be "...the height required by 110.26(E)." 110.26(E) provides a height requirement only for "service equipment, switchboards, panelboards, or motor control centers," and provides no requirement for other equipment that may require "examination, adjustment, servicing, or maintenance while energized." I doubt very much that that is the panel’s intent, but that is what the section says. If the panel intends that a height requirement apply to equipment other than that to which 110.26(E) clearly limits itself, then the proposal should have been accepted. Otherwise other types of equipment will have specified width and depth requirements but no height so the working space for such equipment will have no limits. A more user-friendly approach would be to state the requirement in 110.26(A)(3) rather than referring to another subsection. If the panel intends that the minimum height requirements be 6-1/2 ft in all cases except for in existing dwelling units, the alternative wording suggested above should be accepted and the original proposal should have been accepted in principal.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its statement on Proposal 1-116. 110.26(A)(3) references the height requirements (dimensions) contained in 110.26(E) for the equipment addressed in 110.26(A). It does not limit the working space height to the specific equipment addressed in 110.26(E).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

HITTINGER, D.: I am voting negative on the panel action to reject Comment 1-80 with the following explanation: The submitter has identified a problem with determining the height of working space and headroom requirements as found in 110.26(A)(3) that references 110.26(E). The list in 110.26(E) only references service equipment switchboards, panelboards and motor control centers so there is no requirement for equipment not mentioned in the list. Inserting the proposed text into 110.26(A)(3), would provide users of the code the necessary language to install and enforce height requirements for all electrical equipment.

MCMAHILL, L.: The submitter’s comment that “there would be no minimum height requirement for equipment such as safety switches, combination motor controllers, control panels, or the like” is correct. Section 110.26(E) is specific to “service equipment, switchboards, panelboards, or motor control centers.” This is a minor oversight that may need to be clarified during the 2011 NEC cycle by deleting “about service equipment, switchboards, panelboards, or motor control centers” from Section 110.26(E). This would likely meet the intent of the submitter and the code.

I-81 Log #1455 NEC-P01
(110.26(A)(3))

Submitter: James O’Driscoll, IBEW Local #98

Comment on Proposal No: 1-113

Recommendation: I agree with the submitter and Mr. P. Hickman.

Substantiation: The submitter’s substantiation portrays real-life hazards in the field. As a journeyman electrician, I worked on many installations where panelboards were installed in stairwells. I felt that doing any kind of maintenance or new additions to these panelboards was very hazardous. Especially, with the advent of NFPA 70E, how can the Code permit these types of installations.

Panel Meeting Action: Reject

Panel Statement: This public comment does not contain proposed text as required by 4.4.5(c) of the Regulations Governing Committee Projects.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

I-82 Log #1457 NEC-P01
(110.26(A)(3))

Submitter: James O’Driscoll, IBEW Local #98

Comment on Proposal No: 1-114

Recommendation: I agree with the submitter and Mr. P. Hickman.

Substantiation: The submitter’s substantiation portrays real-life hazards in the field. As a journeyman electrician, I worked on many installations where panelboards were installed in stairwells. I felt that doing any kind of maintenance or new additions to these panelboards was very hazardous. Especially, with the advent of NFPA 70E, how can the Code permit these types of installations.

Panel Meeting Action: Reject

Panel Statement: This public comment does not contain proposed text as required by 4.4.5(c) of the Regulations Governing Committee Projects.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

I-83 Log #1468 NEC-P01
(110.26(A)(3))

Submitter: James O’Driscoll, IBEW Local #98

Comment on Proposal No: 1-115

Recommendation: I agree with the submitter and Mr. P. Hickman.

Substantiation: The submitter’s substantiation portrays real-life hazards in the field. As a journeyman electrician, I worked on many installations where panelboards were installed in stairwells. I felt that doing any kind of maintenance or new additions to these panelboards was very hazardous. Especially, with the advent of NFPA 70E, how can the Code permit these types of installations.

Panel Meeting Action: Reject

Panel Statement: This public comment does not contain proposed text as required by 4.4.5(c) of the Regulations Governing Committee Projects.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

I-84 Log #389 NEC-P01
(110.26(C))

Submitter: Noel Williams, Noel Williams Consulting

Comment on Proposal No: 1-86 and Proposal 1-127

Comment on Proposal No: 1-119

Recommendation: Further revise the text of 110.26(C) from that made at the ROP stage as follows:

(C) Entrance to and Egress from Working Space.

(1) Minimum Required. At least one entrance of sufficient area shall be provided to give access to and egress from working space about electrical equipment.

(2) Large Equipment. For equipment rated 1200 amperes or more that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to and egress from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high at each end of the working space. Where the entrance has a personnel door(s), the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure. A single entrance to and egress to the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (C)(2)(b) is met.

(a) Unobstructed Egress Exit. Where the location permits a continuous and unobstructed way of egress travel, a single entrance to the working space shall be permitted.

(b) Extra Working Space. Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located so that the distance from the equipment to the nearest edge of the entrance is less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

Substantiation: I serve as chairman of the NFPA 101 and NFPA 5000 Means of Egress Technical Committee (MEA). NFPA 101 and NFPA 5000 are in the June 2008 revision cycle. The MEA committee developed committee proposals to reference NFPA 70 110.33(A). Users of NFPA 101/5000 have followed the criteria of those codes only to find that the design was deficient from the requirements of NFPA 70. By referencing NFPA 70 110.33(A), the user of NFPA 101/5000 will be warned that the related provisions from NFPA 70 apply. However, some of the terminology used in 110.26(C) is inconsistent with that in NFPA 101/5000.

(1) With respect to the addition of the words “and egress from” in (C)(2), this is a correction to what was reported in the ROP. It appears the submitter of the proposal included the addition of those words, but they were not underscored and went unnoticed. Thus, the committee action on NEC Proposal 1-119 should have read: “The panel accepts only the submitter’s recommendation to insert ‘and egress from’ in four places.”
(2) With respect to the replacement of the word “exit” with the word “egress” in two places in (C)(2)(a), the word “exit” has a special meaning in NFPA 101/5000 which can be generalized to mean the final door reached to the outside. Other travel across floors and through doors encountered along the egress path is part of the exit access. So in describing the route to the exit, the term “egress” is more correct.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-85 Log #652 NEC-P01

A-76 Log #892 NEC-P01

Final Action: Reject

Submitter: Michael Cole, MRC Electric

Comment on Proposal No: 1-127

Recommendation: Change the first paragraph of 110.26(C)(2) as follows, which is slightly different than the original proposal by Alan Manche. This proposal appears to be acceptable by CMP and will be rejected by Panel. The language on pages 84 and 91 where double width equipment over 1.8 m (6 ft) overwidth condition 3 in Table 110.26(A)(1) shall be applied with a reasonable depth allowance for future equipment.

Add fine print note:
FPN: A double width working space minimizes installation and maintenance labor, and allows workers to more readily and safely work when there are ladders, wire reels, and so forth in the working space. A working space with both double space and double exits provides both superior safety and greatly reduces labor for installation and maintenance.

Substantiation: a. Equipment that is over 6 ft wide regardless of ampere capacity presents several headaches with respect to safety, installation, and maintenance. A single width double exit working space no longer has 2 exits when somebody is working on a ladder. Also, for equipment that is over 6 ft wide there needs to be extra room and/or exits such that 2 or more people can work in there. One such instance is when OSHA or insurance regulations require that there be 2 people working together in the room.

b. Another instance where double space and/or exits is needed is that having 2 or more electrical workers in the room minimizes installation time and optimizes installation labor. The less frustrated people are the more likely that they will work safely and efficiently. Also, the most efficient way to pull multiple general purpose branch circuits into raceways is to put the wire reels in the electrical closet and pull all of the home runs from there to the first box.

Allocating a double width working space is NOT a waste of resources - it can actually save money as well as enhancing safety. For that matter, it PAYS to use 2.5 in. schedule 80 PVC conduit for a 200 amp residential underground electrical service because of the savings on wire pulling labor. If you have a 4 person crew and no place to hook up a wire pulling winch or a fork lift truck, the wire pull needs to be really easy. See Chapter 9, Fine Print Note No. 2 for jamming criteria when pulling wires around a conduit bend.

c. Oftentimes, equipment that is over 6 ft wide requires double width working space and/or double exits just to be able to get the equipment into the electrical room.

d. Not being able to install equipment on both sides of an electrical closet is a constraint that nobody likes to see.

Panel Meeting Action: Reject
Panel Statement: As stated in 90.1(C), the Code is not a design specification or a manual for untrained persons. The submitter’s recommendation contains language that is vague and unenforceable.

The substantiation does not supply technical justification to require two means of access / egress or double the working space where equipment of any width is greater than 1.8 m (6 ft) wide and over 6 ft high at each end of the working space. In new installations where equipment can be installed on both sides of the working space condition 3 in Table 110.26(A)(1) shall be applied with a reasonable depth allowance for future equipment.

Final Action: Reject

Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc.

Comment on Proposal No: 1-127

Recommendation: Reject this proposal. Restore wording to 2005 NEC language.

Substantiation: The proposal appears to use the logic that providing 2 means of egress for electrical equipment with “increased hazard” is too difficult or confusing. If this is the case, this is not a good reason for a change in the wording of this section.

As both Mr. Hickman and Mr. McMahill pointed out in their Explanation of Negative, the two means of egress about this equipment is for worker safety. Modern electrical equipment, especially at the 480-volt nominal range, can provide tremendous levels of arc flash and blast. The size of modern equipment is getting smaller with increasing levels of electrical energy, and also being placed more often in rooms to prevent the unqualified from exposure. Without adequate egress from this level of danger, extra exposure time to the arc flash increases the level of danger to the worker, even with proper PPE protection.

As the proposal’s submitter states: “The arc blast or incident energy at a location is based on the voltage, available short circuit current, separation between the electrodes (phases), the distance a worker’s body parts are from the arcing fault, and the duration of the fault.”

Panel Meeting Action: Reject
Panel Statement: The Comment does not provide any new information and the Panel reaffirms its action based on the substantiation contained in Proposal 1-127.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

HICKMAN, P.: We are voting negative to the panel action to reject Comment 1-86. Our explanation is as follows: This comment should have been accepted to maintain the direction the panel took on this issue last cycle. Clearly, equipment much smaller than 6 ft can be extremely dangerous and would warrant the protection afforded by the requirements of 110.26(C)(2). As we stated in our comment to the negative during the ROP, we point to the substantiation provided by Mr. Ray Jones, current chairman of the NFPA 70E Technical Committee. The submitted IEEE paper entitled Staged Tests Increase Awareness of Arc-flash Hazards in Electrical Equipment (Paper no. PCIC 97-34, which was published in the IEEE Transactions on Industry Applications in 1998 we point to Test #4 of Table 1 on page 3. This test shows a Size 1 combination starter with a 30 ampere fused switch and protected by a 640 ampere power circuit breaker that did not open when a line side phase-to-ground fault was created. Clearly, a Size 1 combination starter is smaller than 6 ft, however, the ensuing arc-fault and blast was quite substantial with 22,000 amps available on a 640 ampere device.

MCMAHILL, L.:CMP-1 should have maintained the language from the ‘05 NEC as requested by several comments submitted. By adding “and over 1.8 m (6 ft) wide” to the equipment requirement simply adds confusion. For example, does the requirement apply to the individual pieces of equipment or to an assembly only? Is the hazard less where a 4 ft wide 3000A switchboard is installed compared to an 8 ft wide 1200A switchboard? The change to the ‘05 NEC was to eliminate this confusion and to clarify the intent. In addition, the width of the equipment should have no bearing on the hazard. If anything, the rating of the equipment is of greater importance.

Comment on Affirmative:

BARRIOS, L.: CMP 1 did the right thing to reinstate the 6 foot wide requirement for requiring multiple means of egress. Physical size of the equipment should continue to be a criteria. The used to determine the amount of entrances needed for safe egress from an electrical equipment room or building. It is the physical size and placement of the equipment inside a room which creates barriers and obstructions for safe egress, not the equipment’s continuous current rating alone. This is not solely an arc blast issue. The issue is providing an unobstructed path for persons to exit the area not only under equipment fault conditions, but also including fire and other events requiring emergency egress. The 6 foot wide equipment criteria has been in the NEC since 1978 (increased from 4-foot prior to that). Providing unobstructed paths is based on the physical size and location of the equipment and the size of the area in which the equipment is installed. It would not be based solely on the continuous current rating of the equipment.

LABRAKE, JR., N.: EEI agrees with the Panel’s action on this Comment and Proposal 1-127, which restores the 6 ft. requirement. EEI further agrees with the Panel’s statement on Proposal 1-125, which states “The panel removes the control of basing exiting requirements on incident energy levels.” This section primarily deals with working space for large equipment rather than arc flash boundaries.”
110.26 Spaces About Electrical Equipment

(C) Entrance to Working Space

(1) Minimum Required. At least one entrance of sufficient area shall be provided to give access to working space about electrical equipment.

(2) Large Equipment.

(a) Entrance and Egress. For equipment rated 1200 amperes or more and over 8.6 m (25 ft) wide that contains operating devices, switching devices, or control devices, there shall be one entrance to the required working space not less than 610 mm (24 in.) wide and 2.0 m (6 ft) high at each end of the working space. A single entrance to and egress from the required working space shall be permitted wherever either of the conditions in 110.26(C)(2)(a)(1) or (C)(2)(a)(2) is met.

(b) Unobstructed Exit. Where the location permits a continuous and unobstructed way of egress travel, a single entrance to the working space shall be permitted.

(2) Extra Working Space. Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located so that the distance from the entrance to the nearest edge of the working space is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

(b) Personnel Doors. Where the entrance to equipment rated 1200 amperes or more has a personnel door(s) that is less than 15 m (50 ft) from the working space, the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.

A single entrance to the required working space shall be permitted where either of the following conditions is met:

(a) Entrance and Egress. For equipment rated 1200 amperes or more and over 8.6 m (25 ft) wide that contains operating devices, switching devices, or control devices, there shall be one entrance to the required working space not less than 610 mm (24 in.) wide and 2.0 m (6 ft) high at each end of the working space. A single entrance to and egress from the required working space shall be permitted wherever either of the conditions in 110.26(C)(2)(a)(1) or (C)(2)(a)(2) is met.

(b) Unobstructed Exit. Where the location permits a continuous and unobstructed way of exit travel, a single entrance to the working space shall be permitted.

(2) Extra Working Space. Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located so that the distance from the entrance to the nearest edge of the working space is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

Substantiation: The intent of this comment is to preserve the requirement for doors to swing in the direction of egress with panic hardware when required. The action in the proposal stage to replace the six foot dimension for equipment achieves the intent of the submitter, but inadvertently eliminates doors in the direction of egress, and panic hardware where equipment is rated 1200 amperes or more but is less than six feet in width. The width of the equipment does not affect in any way, the incident energy created in an arc flash/blast. Retaining this requirement is essential for the safety of all installers and maintainers of electrical equipment.

The revision is editorial in nature. Rearranging the requirements of 110.26(A)(2) in two third level subclauses, (a) Panic Hardware and Panic and (b) Personnel Doors, is user friendly as it separates the two requirements for clarity. This separation of requirements allows for the six foot dimension which is reinstated, to apply only to the requirements addressing two doors and not the requirement for door swing and panic hardware. Other changes accepted by CMP-1 are included in this text for clarity. The distance of six feet accepted in proposal 1-123 is revised to 15 m (50 ft) to coordinate with a sister comment to modify 1-123.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel actions and statements on Comments 1-86 and 1-92. The panel concludes that 25 ft is an adequate distance. The panel does not necessarily agree with all of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative: LABRAKE, JR., N.: This comment should be rejected and accept Proposal 1-127. The panel reversed its position from their statement on Proposal 1-125, whereby the Panel rejected the concept of basing exiting requirements on incident energy levels. This section primarily deals with working space found typically in NFPA 70E, which is outside of the scope of this installation Code.

Although EEI strongly supports safe installations for the use of electricity, strong evidence from a fact finding report is needed to establish changes to the distance to doors requiring panic hardware. The door criterion of 6 ft. in Proposal 1-123 was primarily to prevent a door swing interfering with the work space.
TCC Action: It is the understanding of the Technical Correlating Committee that the panel action is to delete the last sentence in 110.26(C)(2), and add a new item 110.26(C)(3) as shown in the panel action.

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 1-127

Recommendation: Delete the following text from 110.26(C)(2): Where the entrance has a personnel door(s) that is less than 2.5 m (8 ft) from the working space, the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.

And add a new item (3) to 110.26(C) that reads as follows:

(3) Personnel Doors, Where equipment rated 1200A or more is installed the entrance has and there is a personnel door(s) that is less than 41.47 m (135 ft) from the nearest edge of the working space, the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.

Substantiation: This proposal is to accomplish three objectives:

1) The addition of the “over 6 ft” language back into 110.26(C)(2) was the proper action for the panel. However, since the panel has now added a dimension of measurement to apply to the door(s) to the room, the paragraph needs to be broken into two parts. This comment moves the text associated with the panic bars and creates a new second item (3) where the text can stand on its own. This makes the requirement much easier to apply.

2) The driver language for the door requirement in the new (3) is proposed to be based only on the “rated 1200A or more” without the 6 ft being a part of that requirement. This is logical since the need to have the panic hardware on the door is independent of the two exits from the working space.

3) The comment also adds text to make it clear that the 6 ft measurement for the personnel door is measured from the nearest edge of the working space. The language is also revised to remove the text “the entrance has” and replace it with “and there is”. This is to avoid the confusion of the use of the term “entrance”. In (C)(2), the use of the term “entrance” is to describe entering the working space and not necessarily the room. Using the term again to describe the personnel door implies that the door is truly the entrance to the working space, when in fact it may be located up beyond the working space.

We also recognize the 6 ft distance between the working space and the personnel door was a value proposed by the panel looking for further feedback. Based on our discussion with others in the industry it is evident there is support for a distance much larger than 6 ft based on the idea that someone is injured it doesn’t matter if the equipment is in a small room or large room, that person will needs to exit the room in order to remove himself from further danger to the environment within the room where the equipment is installed. Based on the environmental conditions witnessed in our large testing labs after an arc-flash demonstration, it would be prudent to consider extending the 6 ft distance to at least 25 ft in order to include appropriate hardware on exits doors for the room in which the equipment is located.

Panel Meeting Action: Accept in Principle

This proposal does not accept the deletion of the struck-through text of the first paragraph of the recommended wording, and concludes that it will be relocated into a new second level subdivision (3).

And add a new item (3) to 110.26(C) that reads as follows:

“(3) Personnel Doors. Where equipment rated 1200A or more that contains overcurrent devices, switching devices, or control devices is installed and there is a personnel door(s) intended for entrance to and egress from the working space less than 7.6 m (25 ft) from the nearest edge of the working space, the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.”

Panel Statement: The panel does not accept the deletion of the struck-through text of the first paragraph of the recommended wording, and concludes that it will be relocated into a new second level subdivision (3). The phrase “that is” was removed to editorially simplify the statement.

The phrase “intended for entrance to and egress from the working space” was added to clarify the personnel doors intended to be covered by this requirement.

The panel does not necessarily agree with all of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

LABRAKE, JR., N.: This comment should be rejected and accept Proposal -23. Refer to my negative ballot statement on Comment -87.

Final Action: Accept in Principle

Report on Comments A2007 — Copyright, NFPA
This comment has been balloted through CMP-9 with the following balloting results:

**Number Eligible to Vote:** 12  
**Final Action:** Hold  
**Ballot Results:** Affirmative: 12

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Comment on Proposal No: 1-135  
**Submitter:** Charles Ball, S & C Electric Company  
**Governing Committee Projects which states:** 

- **Final Action:** Reject  
- **Ballot Results:** Affirmative: 2, Not Returned (W. Bowman and R. Carlson)

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The submitter does not agree with the panel statement, “The

- **Final Action:** Hold  
- **Ballot Results:** Affirmative: 12, Negative: 1

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Comment on Proposal No: 1-135  
**Submitter:** Michael Walls, American Chemistry Council  
**Governing Committee Projects which states:** 

- **Final Action:** Reject  
- **Ballot Results:** Affirmative: 12, Not Returned (H. deVega)

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Copyright, NFPA 70 — Copyright, NFPA
the definition of what constitutes "accidental contact" is extremely broad and unclear." The phrase "accidental contact" is already used in the existing 110.27 three times, including the title. The use of the phrase is already broad and unclear. And while the submitterconcurs with the panel that "the only positive way to ensure that accidental contact with live parts does not occur is to deenergize the equipment prior to working on it", equipment designs today continue to require examination and troubleshooting while energized. Also, the act of establishing an electrically safe working condition, which includes verifying a de-energized state using test equipment, requires a qualified person to assume the equipment is energized.

The separate sections for "qualified" and "unqualified" persons were removed from the original proposal in order to satisfy the panel statement. "Approved enclosures" was relocated to the first option in the listing and does not change the original intent of the section. The originally proposed Part B in proposal 1-139 was re-written and added as options 6 and 7 as suggested by Mr. Floyd's affirmative ballot comment.

Panel Meeting Action: Reject
Panel Statement: The panel concludes that new Items (6) and (7) suggested in the comment relate to live parts within approved enclosures and are not alternatives to Items (1) through (5) as would be implied by the text of 110.27(A).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
BARRIOS, L.: In its Proposal -39 and subsequent Comment -97, the Technical Correlating Committee directs the panel to make at the ROP stage as follows:

- Recommend that new Items (6) and (7) suggested in the comment relate to live parts within approved enclosures and are not alternatives to Items (1) through (5) as would be implied by the text of 110.27(A).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
FLOYD, H.: CMP should have accepted this comment. Touch safe shrouded terminals provide an inherently safer design that reduces the risk of inadvertent contact having the risk of electric shock or initiation of an arc flash. The NEC should acknowledge that the application of touch safe shrouded terminals provide a safer work environment for both qualified as well as unqualified personnel. These types of designs are widely used outside of the US and significantly reduce the risk of inadvertent personnel contact in industrial control panels and other equipment. The requirement for touch safe shrouded terminals designs has proven both acceptable and reasonable in installations outside the US. I would encourage the submitter to resubmit the proposal for the 2011 NEC.

Panel Meeting Action: Reject
Panel Statement: The panel does not accept the deletion of the struck-through text of the first paragraph of the recommended wording, and concludes that it will be relocated into a new second level subdivision (3).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
LADRAKE, JR., N.: This comment should be rejected and accept Proposal 1-148. The panel reversed its position from their statement on Proposal 125, whereby the Panel rejected the concept of basing existing requirements on incident energy levels. This section primarily deals with working space for large equipment rather than arc flash boundaries. A requirement for "panic hardware" and outward exit swing for all doors within 25 feet of the workspace for equipment rated above 600 volts is considered excessive and unjustified.

The Comment offers no fact finding report in the technical substantiation that the work space shall be larger, but has based the change on work rules found typically in NFPA 70E, which is outside of the scope of this installation Code. The phrase "intended for entrance to and egress from the working space" was added to clarify the personnel doors intended to be covered by this requirement.

The panel does not necessarily agree with all of the submitter's substantiation.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee that the panel action is to delete the last sentence in proposal -48.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

FLOYD, H.: CMP should have accepted this comment. Touch safe shrouded terminals provide an inherently safer design that reduces the risk of inadvertent contact having the risk of electric shock or initiation of an arc flash. The NEC should acknowledge that the application of touch safe shrouded terminals provide a safer work environment for both qualified as well as unqualified personnel. These types of designs are widely used outside of the US and significantly reduce the risk of inadvertent personnel contact in industrial control panels and other equipment. The requirement for touch safe shrouded terminals designs has proven both acceptable and reasonable in installations outside the US. I would encourage the submitter to resubmit the proposal for the 2011 NEC.

Panel Meeting Action: Reject
Panel Statement: The panel does not accept the deletion of the struck-through text of the first paragraph of the recommended wording, and concludes that it will be relocated into a new second level subdivision (3).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

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Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee that the panel action is to delete the last sentence in proposal -48.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

FLOYD, H.: CMP should have accepted this comment. Touch safe shrouded terminals provide an inherently safer design that reduces the risk of inadvertent contact having the risk of electric shock or initiation of an arc flash. The NEC should acknowledge that the application of touch safe shrouded terminals provide a safer work environment for both qualified as well as unqualified personnel. These types of designs are widely used outside of the US and significantly reduce the risk of inadvertent personnel contact in industrial control panels and other equipment. The requirement for touch safe shrouded terminals designs has proven both acceptable and reasonable in installations outside the US. I would encourage the submitter to resubmit the proposal for the 2011 NEC.

Panel Meeting Action: Reject
Panel Statement: The panel does not accept the deletion of the struck-through text of the first paragraph of the recommended wording, and concludes that it will be relocated into a new second level subdivision (3).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

FLOYD, H.: CMP should have accepted this comment. Touch safe shrouded terminals provide an inherently safer design that reduces the risk of inadvertent contact having the risk of electric shock or initiation of an arc flash. The NEC should acknowledge that the application of touch safe shrouded terminals provide a safer work environment for both qualified as well as unqualified personnel. These types of designs are widely used outside of the US and significantly reduce the risk of inadvertent personnel contact in industrial control panels and other equipment. The requirement for touch safe shrouded terminals designs has proven both acceptable and reasonable in installations outside the US. I would encourage the submitter to resubmit the proposal for the 2011 NEC.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee that the panel action is to delete the last sentence in proposal -48.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

FLOYD, H.: CMP should have accepted this comment. Touch safe shrouded terminals provide an inherently safer design that reduces the risk of inadvertent contact having the risk of electric shock or initiation of an arc flash. The NEC should acknowledge that the application of touch safe shrouded terminals provide a safer work environment for both qualified as well as unqualified personnel. These types of designs are widely used outside of the US and significantly reduce the risk of inadvertent personnel contact in industrial control panels and other equipment. The requirement for touch safe shrouded terminals designs has proven both acceptable and reasonable in installations outside the US. I would encourage the submitter to resubmit the proposal for the 2011 NEC.
(a) Unobstructed Egress. Where the location permits a continuous and unobstructed way of egress to travel, a single entrance to the working space shall be permitted.

(b) Extra Working Space. Where the depth of the working space is twice that required by 110.34(A), a single entrance shall be permitted. It shall be located so that the distance from the equipment to the nearest edge of the entrance is not less than the minimum clear distance specified in Table 110.34(A) for equipment operating at that voltage and in that condition.

(2) Guarding: Where bare energized parts at any voltage or insulated energized parts above 600 volts, nominal, to ground are located adjacent to such entrance, they shall be suitably guarded.

(B) Access. Permanent ladders or stairways shall be provided to give safe access to and egress from the working space around electric equipment installed on platforms, balconies, or mezzanine floors or in attic or roof rooms or spaces.

Substantiation: I serve as chairman of the NFPA 101 and NFPA 5000 Means of Egress Technical Committee (MECA). NFPA 101 and NFPA 5000 are in the June 2008 revision cycle. The MEA committee developed committee proposals to reference NFPA 70 110.33(A). Users of NFPA 101/5000 have followed the criteria of those codes only to find that the design was deficient from the requirements of NFPA 70. By referencing NFPA 70 110.33(A), the user of NFPA 101/5000 will be warned that the related provisions from NFPA 70 apply. However, some of the terminology used in 110.33(A) is inconsistent with that in NFPA 101/5000.

(1) With respect to the addition of the words “and egress from” in 110.33 title, 110.33(A)(1), and 110.33(B), these changes are for consistency with the action taken in NEC Proposal 1-119 on 110.26(C). The subjects of 110.26(C) and 110.33(A) and (B) are related, and should be handled consistently.

(2) With respect to the replacement of the word “exit” with the word “egress” in two places in (A)(a), the word “exit” has a special meaning in NFPA 101/5000 which can be generalized to mean the final door reached to the outside. Other travel across floors and through doors encountered along the egress path is part of the exit access. So, in describing the route to the exit, the term “egress” is more correct.

Panel Meeting Action: Reject
Panel Statement: The content of the comment does not address the subject matter of Proposal 1-147.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-101 Log #8 NEC-P01
(110.34(A))
Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 1-151
Recommendation: The Technical Correlating Committee directs the panel to reconsider their action relative to the necessity of a soft conversion. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-102 Log #816 NEC-P01
(110.81)
Submitter: John Whitney, Newtown Square, PA
Comment on Proposal No: 1-160 Log
Recommendation: Revise text: Unused openings shall be effectively closed.
Substantiation: Unused openings in underground enclosures permit ingress of ground water which carries soils into the enclosure. Over time, the accumulation of soils will completely engulf the electrical facilities within the enclosure. Accumulation of soils containing electrical cables and equipment within the space introduces additional hazards into the already hazardous environment of the space. Soils can conceal damaged cables or equipment and clearing the soils from concealed cables and equipment requires extreme care not to damage the facilities. Underground enclosures by their location are expected to be subject to ground water ingress, however, the simple requirement to effectively close unused openings will limit or eliminate soils accumulation within underground enclosures resulting in safer installation and maintenance of the electrical facilities therein.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms their panel action and panel statement on Proposal 1-160.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-103 Log #822 NEC-P01
(110.82 (New))
Submitter: John Whitney, Newtown Square, PA
Comment on Proposal No: 1-161
Recommendation: Add a new section:
Protection Against Corrosion and Deterioration. Equipment, cable racks, cable rack arms, other appurtenances and all supporting hardware shall be corrosion resistant and of materials suitable for the environment in which they are to be installed.

Panel Meeting Action: Reject
Panel Statement: The panel concludes that this material is already covered in the 110.11 FPN that refers the reader to 300.6.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

I-104 Log #823 NEC-P01
(110.83 (New))
Submitter: John Whitney, Newtown Square, PA
Comment on Proposal No: 1-162
Recommendation: Add a new section:
Cable Seals. All cables and conductors entering underground enclosures shall be effectively sealed.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its action and statement on Proposal 1-162.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Although there are certainly other opportunities for cable identification in other sections of the NEC, this proposal specifically addresses a need to mitigate electrical hazard exposure to personnel working within enclosures intended for personnel entry and as such, belongs in Article 110, paragraph V.

**Panel Meeting Action:** Reject

**Panel Statement:** The panel reaffirms its action and statement on Proposal 1-164.

The proposed text is overly restrictive in that it would require identification of all cables in all manholes, even though the cables may all be power circuits under the ownership and control of a single entity.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 9 Negative: 3

**Explanation of Negative:**

ANTHONY, M.: Our interest group is interested in the outcome of Proposal 1-164 because many colleges and universities have power plants and utility distribution systems that operate much like utilities. Some have power distribution networks that share poles with telecommunication cabling and municipal signaling systems.

Further discussion within our interest group indicates that this is a reasonable proposal that should have been accepted at the proposal stage. We agree with Mr. Hickman and Mr. Hittinger’s substantiation negative votes in the proposal stage (Log #2357). I would like to add that OSHA looks to the NEC for safety rules and identification of a hazard is one of the most basic. OSHA’s general purpose clauses, as well as the specific ones regarding enclosed spaces and locking ought to be supplemented with specific NEC language that this proposal provides.

HICKMAN, P.: We are voting negative to the panel action to reject Comment 1-106. Our explanation is as follows: This comment should have been accepted. We reaffirm our position from the ROP which states the submitter has identified and provided a solution to a serious safety issue. As Mr. Hittinger stated in his explanation of negative in the ROP: “Identification of cables and conductors within enclosures would benefit personnel that must perform maintenance duties within the enclosure”. The marking of cables within enclosures would be a step in the right direction for safety of personnel and property due to misidentification of cables being cut by mistake.

HITTINGER, D.: I am voting negative on the panel action to reject Comment 1-106 with the following explanation: We reaffirm our position from the ROP stating the submitter has identified and provided a solution to serious safety issue. A properly labeled system would be a benefit to the owner and provide the necessary information to a field worker. There are similar requirements in 408.4: Circuit Directory or Circuit Identification. Every circuit and circuit modification shall be legibly identified as to its clear, evident and specific purpose or use. The identification shall include sufficient detail to allow each circuit to be distinguished from all others. The identification shall be included in a circuit directory that is located on the face or inside of the panel door in the case of a panelboard, and located at each switch on a switchboard.

This requirement has worked well for years and is helpful to owners and workers and does provide a level of safety.

The proposed new section 110.85 would benefit worker safety when asked to enter enclosures to work on these systems.

**ARTICLE 200 — USE AND IDENTIFICATION OF GROUNDED CONDUCTORS**

5-19 Log #271 NEC-P05 (200.6 (A) and 200.6 (B))

**Final Action:** Reject

**Submitter:** Dennis Downer, Morrisville, VT

**Comment on Proposal No:** 5-44

**Recommendation:** Revise text to read as follows:

200.6 Means of Identifying Grounded Conductors.

(A) Insulated conductor. An insulated grounded conductor or AWG shall be identified by a continuous white or gray outer finish or by three continuous white stripes on other than green insulation along its entire length. Wires that have their outer covering finished to show a white or gray color but have colored tracer threads in the braid identifying the source of manufacture shall be considered as meeting the provisions of this section. Insulated grounded conductors shall also be permitted to be identified as follows:

1. The grounded conductor of a mineral-insulated, metal-sheathed cable shall be identified at the time of installation by distinctive marking at its terminations.

2. A single-conductor, sunlight-resistant, outdoor-rated cable used as a grounded conductor in photovoltaic power systems as permitted by 690.31 shall be identified at the time of installation by distinctive white marking at all terminations and inclosures.

3. Fixture wire shall comply with the requirements for grounded conductor identification as specified in 402.8.

4. For aerial cable, the identification shall be as above, or by means of a ridge located on the exterior of the cable so as to identify it.
Change the title of 200.6(B) and text to the following:

200.6(B) Sizes larger than 6 AWG Conductors 4 AWG or Larger. An insulated grounded conductor 4 AWG or larger than 6 AWG shall be identified by one of the following means:

Substantiation: This will make the language the same as 250.119. As an electrical inspector, I cannot remember the number of times I have written this up because people cannot read. I think that changing the language from Sizes Larger than 6 AWG to Sizes 4 AWG or Larger will leave no room for misreading the title, is 6 AWG included or is it larger than 6?

Panel Meeting Action: Reject

Panel Statement: The proposed change would create a violation of the NEC Style Manual as it deletes the boldfaced title of the section. The present Code language is precise in covering the conductors 6 AWG and smaller as well as conductors larger than 6 AWG.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-20 Log #272 NEC-P05 (200.6(B))

Submitter: Dennis Downer, Morrisville, VT
Comment on Proposal No: 5-45

Recommendation: Change the title of 200.6(B) and language to the following:

200.6(B) Sizes Larger than 6 AWG. Sizes 4 AWG or Larger. An insulated grounded conductor 4 AWG or larger than 6 AWG shall be identified by one of the following means:

Substantiation: As an electrical inspector, I cannot remember the number of times I have written this up because people cannot read. I think that changing the language from Sizes Larger than 6 AWG to Sizes 4 AWG or Larger will leave no room for misreading the title is 6 AWG included or is it larger than 6. It will also now be the same format as 200.6(A) Sizes 6 AWG or smaller.

Panel Meeting Action: Reject

Panel Statement: The present Code language is precise in covering the conductors 6 AWG and smaller as well as conductors larger than 6 AWG.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-21 Log #825 NEC-P05 (200.6(B))

Submitter: Tom Studer, Electric Inspection agency
Comment on Proposal No: 5-45

Recommendation: Reject proposal.

Substantiation: This proposal should have been rejected. The proposer referenced 250.119(A)(1), where the rule requires marking of a grounding conductor at each end and at every point where the conductor is accessible. 200.6(B)(3) simply requires the conductor to be marked at its terminations. No where in this rule is there a requirement to mark the grounded conductor where the conductor is accessible, such as conduit bodies or pull boxes. Since there is no requirement to mark a grounded conductor in conduit bodies where the grounded conductor is not terminated, adding an exception to specifically permit a grounded conductor to be not marked where that conductor is not terminated serves no purpose other than to add confusion. i.e. This is an exception to a rule where the rule does not exist.

Panel Meeting Action: Accept

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-22 Log #507 NEC-P05 (200.11)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 5-47

Recommendation: Accept the proposal.

Substantiation: Since the polarity of ac circuits regularly reverse there is no designated “polarity” for a grounded conductor terminal or lead. The proposal has nothing to do with limiting “polarity” to only dc circuits.

Panel Meeting Action: Reject

Panel Statement: “Polarity” in general means the relationship between two opposite attributes. Looking at other NEC uses of this word, that is the idea that applies. The submitter has provided no technical substantiation to support narrowing the view of this term to apply only to dc.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
2-10 Log #641 NEC-P02
(210.4(E) (New) )

Final Action: Accept

Submitter: Mark Shapiro, Farmington Hills, MI

Comment on Proposal No: 2-16
Recommendation: Reject the proposed new subsection.

Substantiation: This is one of three proposals that have been accepted to modify this section, to help identify the conductors in multiwire branch circuits. With the acceptance of either of the other 2, this one is unnecessary.

Some form of flagging out multiwire branch-circuits is good. In addition to the reasons given in the ROP, my own experience is that there are too many multiwire branch-circuits that are not properly balanced or “phased out” in electrical panels. Requiring grouping or identifying will make it easier to keep track of them.

But, assuming the passage of the latest proposals, we’re already identifying conductors by voltage system, and soon by phase [210.5(C)]. We’re remarking the white conductor in switch legs [200.6(C)] Assuming the passage of either of the other proposals in 2004 we’ve done enough.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
KING, D.: This Comment should have been rejected. Accurate identification of the grounded conductor that is associated with a multiwire branch circuit will prevent the unintentional removal of a multiwire branch circuit grounded conductor when work is being performed in an electrical panel.

Grounded conductor terminal strips are commonly located in the branch-circuit panel board away from the ungrounded circuit conductor termination points. In many cases it is very difficult if not impossible to trace the grounded conductor of a multiwire branch circuit, once it is separated from its associated ungrounded conductors, to its final termination point. Identification of Ungrounded and Associated Grounded Conductors at the branch-circuit panelboard will aid the qualified person servicing multiwire branch circuits.

2-11 Log #653 NEC-P02
(210.4(E) (New) )

Final Action: Reject

Submitter: Michael Cole, MRC Electric

Comment on Proposal No: 2-16
Recommendation: Add to the new text that Mr. Michael L. Last proposed:

(E) Anonymous shared conductor circuits also known as haywire circuits. A load shall not be supplied by tapping one or more conductors of 2-wire or multiwire branch circuit and 1 or more conductors of another 2-wire or multiwire branch circuit. Such circuits create disconnection problems and are a potential source of electrical injury to people or equipment and create nuisance tripping of AFCI and GFCI devices.

Substantiation: a. In Summit County, Ohio, residential electricians are still using the old knob-and-tube practice (but with nonmetallic sheathed cable and boxes) of tapping any hot wire on the first floor and then tapping any neutral on the second floor to supply 3-way switches for a stairway. This is also sometimes done with ceiling lights in bedrooms where a receptacle hot lead on the first floor and a neutral on the second floor is used to supply a ceiling light. In one such instance the installation used more wire and more labor than doing things by the book.

This creates a number of problems in addition to nuisance tripping of AFCI and GFCI circuit breakers necessitating some rewiring, when a neutral of an allegedly de-energized 2-wire circuit is interrupted, the neutral sometimes becomes hot. Tracking down which additional circuit breaker(s) to achieve full disconnection is a pain. In some instances, the open neutral does not become hot until a table lamp or some other load is turned on. Also, switches do not last forever and I know someone who needs to have copper oxide removed from the wire splices in a 20 year old house. I should NOT need to use hot line gloves to do that.

The claim is that it is more efficient to use 2-wire with ground cable instead of using 3-wire or 4-wire with ground cable. It is also more efficient to do splices outside of boxes like in knob-and-tube days or to let drywallers bury junction boxes or to otherwise not do things the right way. Why not do things the right way?

b. In a commercial installation in Cleveland, Ohio, I installed some hot and neutral pigtailed in a ceiling junction box for future addition of some ceiling lights on the same circuit as some wall lights and a future receptacle for a garage door operator on a different circuit. The 2 lighting circuits share 1 neutral and the 2 receptacle circuits share a different neutral. The 2 neutrals are colored white for neutral 1 and gray aka slate for neutral 2. I taped together the neutral and hot pigtailed for the future ceiling receptacle and separately taped together the hot and neutral pigtailed for the future lighting. Nevertheless, a garage door technician hooked up a new receptacle to the WRONG neutral. Now, when I go to work on this installation, I have to turn off 4 circuit breakers instead of 2 which makes temporary lighting a bit difficult to hook up.

c. Some explanatory text that this hazard exits and why haywiring MUST NOT be done does not hurt.

Panel Meeting Action: Reject
Panel Statement: The text of 210.4 deals with multiwire branch circuits, and as such, the submitter’s recommendations regarding two 2-wire circuits are not relevant. In addition, for multiwire branch circuits, the current text of the NEC already prohibits the connections described in the submitter’s substantiation [see 300.3 and 210.4(B)].

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

2-12 Log #839 NEC-P02
(210.4(E) (New) )

Final Action: Accept

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 2-16
Recommendation: The Panel should reconsider and reject the proposal.

Substantiation: It would appear that the panel has implemented redundant provisions for the multi-wire branch circuits. With the addition of the grouping requirement in 210.4(D), the identification requirement in (E) would be redundant. The grouping aspect will make it obvious as to which ungrounded conductors a particular grounded conductor is associated with. There is no need to also have to tag or mark the conductors since the provision written by the panel only applies to the marking or tagging at the panelboard only.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
KING, D.: See my explanation of negative on Comment 2-10.

2-13 Log #1345 NEC-P02
(210.4(E) (New) )

Final Action: Reject

Submitter: Donald M. King, Wilmington, DE

Comment on Proposal No: 2-16
Recommendation: Continue to accept this proposal in principle in part.

Substantiation: Positive identification of the grounded conductor of a multiwire branch circuit at the branch circuit panel board will reduce the hazard of electrical shock and electrocution. It will be also reduce the potential of damage to equipment due to the misidentification and disconnecting of grounded conductors while the associated ungrounded conductors remain energized and supply equipment.

Panel Meeting Action: Reject
Panel Statement: The requirements for common disconnect and grouping of conductors are adequate to address the issues raised for multiwire branch circuits. The requirement to also identify each grounded conductor is redundant to the requirement for grounding in 210.4(D).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
KING, D.: See my explanation of negative on Comment 2-10.

2-14 Log #695 NEC-P02
(210.5 (New) )

Final Action: Reject

Submitter: Jamie McNamara, Hastings, MN

Comment on Proposal No: 6-33
Recommendation: Panel 2 should consider this proposal and accept it as a FPN to 210.5.

Substantiation: This was originally proposed to Panel 6 as a FPN to 310.5 and was referred to Panel 2 by the TCC (Technical Correlating Committee).

See the original Proposal 6-33.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree with the addition of the FPN for the same reasons that a specific color coding is not specified in the NEC. The color code is not consistently applied (particularly where the color gray is used), and the FPN can be misleading because the systems are identified in this manner.
The panel accepts the Technical Correlating Committee direction to
KING, D.: This Comment should be given further consideration. The
Ballot Results:
confusion.
for all three phases of one system, which has the potential to introduce greater
Removing the requirement to ID the phase would allow the same ID to be used
(which in effect prohibits bare conductors permitted by 225.4), Type FC cable,
trolley, and power busways which are continuously or frequently accessible.
power or lighting circuits. Wiring for fire alarm and emergency systems already
of various means of ID at panelboards would be confusing. If phase ID is for
system but is not prohibited from being any phase of another system if tagging
high-rise or large industrial plant. Red could be a color code for Phase A of one
maintain the same type of ID throughout the entire premises wiring system,
to reliably ensure proper ID. More importantly there is no requirement to
Substantiation:
Comment on Proposal No:
2-6 Log #5 NEC-P02
_____________________________________________________________

2-15 Log #9 NEC-P02 Final Action: Accept
(210.5(C))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-23
Recommendation: It was the action of the Technical Correlating Committee
that further consideration be given to the comments expressed in the voting
related to the use of possibly unenforceable and vague terms.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the Technical Correlating Committee direction to
reconsider the proposal and the terminology used. The panel continues to
Accept the text as stated in its panel action in the ROP.
Panel Statement: The term “readily available” is neither vague nor
unenforceable. For very large and complex systems, the ability to have the
conductor ID scheme outlined in system diagrams and documentation is
critical. In these systems, it is likely that this information will be kept more up-
to-date than some type of legend located at each panelboard.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-17 Log #1343 NEC-P02 Final Action: Reject
(210.5(C))

Submitter: Janet D. Skipper, Ocoee, FL
Comment on Proposal No: 2-23
Recommendation: Continue to delete the last sentence that was proposed
by the submitter. In addition, delete the proposed text: “The means of
identification shall be documented in a manner that is readily available or.”
The revised text should read: “210.5 Identification for branch Circuits
(C) Ungrounded Conductors. Where the premises wiring system has branch
circuits supplied from more than one nominal voltage system, each ungrounded
conductor of a branch circuit, where accessible, shall be identified by system at
all termination, connection and splice points. This means of identification shall
be permitted to be by separate color coding, marking tape, tagging, or other
approved means. The means of identification shall be documented to a manner
that is readily available or and shall be permanently posted at each branch-
circuit panelboard or similar branch-circuit distribution equipment. In industrial
occupancies, where conditions of maintenance and supervision ensure that only
qualified persons service the installation, a cable and conductor numbering
system shall be permitted to meet this requirement.”
Substantiation: I concur with the negative explanation that Mr. Weber has
submitted. 210.23 applies generally to all types of occupancies, therefore, there
is assurance that a qualified person will update or maintain files or be available
at the time when the documents will need to be accessible to the Authority
Having Jurisdiction or qualified person servicing the equipment. I also agree
with the negative explanation submitted by Mr. King. The proposed text is
vague and unenforceable and does not include prescriptive language that would
ensure that the intent of this section would be satisfied.
Panel Meeting Action: Reject
Panel Statement: The term “readily available” is neither vague nor
unenforceable. For very large and complex systems, the ability to have the
conductor ID scheme outlined in system diagrams and documentation is
critical. In these systems, it is likely that this information will be kept more up-
to-date than some type of legend located at each panelboard.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

2-18 Log #1897 NEC-P02 Final Action: Accept in Principle
(210.5(C))

Submitter: Frederic P Hartwell, Hartwell Electric Services, Inc.
Comment on Proposal No: 2-24
Recommendation: I. Rephrase the additional text as “phase or line and”.
II. Split the second sentence into two sentences, revised to read as follows:
where both ungrounded conductors are of the same phase but with a potential
difference between them. The panel action incorrectly implies that these
conductors are of differing phases, which is not the case. This wording makes
the rule technically correct.
II. At every seminar I give on the 2005 NEC, someone and usually more
than one, asks whether the panelboard labeling rule covers the conductors
originating at that panel, or whether the rule is a reciprocal rule requiring every
panel to list every identification scheme for every system in the building. The
words in the NEC will support both interpretations. When I raised this at the
Eastern Section IAEL meeting, the speakers had no idea either, and suggested
I address it with a comment. This wording supposes the intent is the former; if
I guessed wrong, then please put contrary wording in the book. It does seem
that when you get a number of systems you would need a huge amount of real
estate to list all the options, so I hope I guessed correctly.
Panel Meeting Action: Accept in Principle

The panel accepts the submitter’s revision to change “phase and” to “phase or line and.”

Revise the last sentence of 210.5(C) of the ROP text to read as follows:

“The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment.”

Panel Statement: The panel has accepted the addition of the words to apply to phase or line conductors. The panel agrees with the intent of the submitter that the identification is required to identify the conductors that originate at that panelboard. To accomplish that intent, the panel has revised the words from the ROP to provide for the identification (whether documentation or posting) before the conductors at that panelboard.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-19 Log #522 NEC-P02 Final Action: Reject (210.5(C) and Exceptions)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 2-27

Recommendation: Accept the proposal as revised:

Where the wiring system has branch circuits supplied from more than one nominal voltage system with different characteristics such as voltage frequency, phases, ac or dc, or supplied from different services, or separately derived systems shall be identified by system at all terminations, connections, and supply points. The means of identification shall be posted where the branch circuit receives its supply.

Exception No. 1: Conductors for fire alarm circuits.
Exception No. 2: Conductors for emergency systems.
Exception No. 3: The enclosures for busway conductors shall be identified in an approved manner.
Exception No. 4: Flat Cable Assemblies Type FC shall only be required to be identified at the point of supply and in junction boxes.
Exception No. 5: Flat Conductor Cable Type FCC shall only be required to be identified at the point of supply.
Exception No. 6: Control and signal circuit conductors installed in the same raceway, cable or enclosure with power or lighting circuits.
Exception No. 7: Where the authority having jurisdiction determines that a system is sufficiently limited or separated from other systems identification shall not be required.

Substantiation: This section only applies to different voltage systems. Interconnection or misconnection of conductors with different characteristics other than voltage, such as ac and dc, grounded and ungrounded, different services, or separately derived can also be hazardous; currents may be improperly divided; feedback to disconnected circuits may occur. Wiring for fire alarm and emergency systems are required to be identified in their respective articles. It is impractical to identify conductors in power, lighting, and trolley busway, Type FC and FCC cableasets all connections and supply points of devices. Present text can require Class 1 circuits installed with power supply circuits to be identified. A limited system which is separated from other systems such as a service supplying only a fire pump room does not warrant identification.

Panel Meeting Action: Reject

Panel Statement: The submitter has not provided substantiation that the requirement should be extended beyond identification of different voltage systems. The original substantiation dealt with the need being associated with voltage systems. The exceptions are unnecessary for the following reasons:

(1) Fire alarm circuits are not covered by Article 210. The branch circuit supplying the fire alarm equipment is covered, but the fire alarm circuits themselves are not.
(2) Emergency systems - the emergency system should be identified in compliance with 210.5 in order to identify which system it is supplied from.
(3) Busway - It is unnecessary to add an exception for busways since the identification is already typically already in place.
(4) FC and FCC Cable - There is no basis to not ID FC cable at its accessible points. For FCC cable, 324.120(B) already requires compliance with 310.12 which requires compliance with 210.5(C).
(5) Control and signal conductors are not always Article 210 Branch Circuits. In cases where they are, they should comply with 210.5(C), in other instances the ID requirements would not apply.
(6) A specific exception for the AHJ to omit the ID requirement is not needed since the current text of 210.5(C) allows “other approved means” and since 904.4 would allow AHJ to permit different methods.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-20 Log #2126 NEC-P02 Final Action: Accept in Part (210.6(D))

Submitter: Robert H. Wills, Intergrid, LLC

Comment on Proposal No: 2-32

Recommendation: I request that the panel reconsider it’s reject vote with the following language substituted for that of the original proposal:

Add a Part (3) and Exception (3) to 210.6(D) Branch-Circuit Voltage Limitations, 600 Volts Between Conductors so that the complete section reads as follows:

(D) 600 Volts Between Conductors. Circuits exceeding 277 volts, nominal, to ground and not exceeding 600 volts, nominal, between conductors shall be permitted to supply the following:

(1) The auxiliary equipment of electric-discharge lamps mounted in permanently installed luminaires (fixtures) where the luminaires (fixtures) are mounted in accordance with one of the following:
   a. Not less than a height of 6.7 m (22 ft) on poles or similar structures for the illumination of outdoor areas such as highways, roads, bridges, athletic fields, or parking lots
   b. Not less than a height of 5.5 m (18 ft) on other structures such as tunnels
(2) Cord-and-plug-connected or permanently connected utilization equipment other than luminaires (fixtures)
(3) Luminaires powered from direct current systems where the luminaire contains a listed, dc-rated ballast that provides isolation between the dc power source and the lamp circuit and protection from electric shock when changing lamps.

FPN: See 410.78 for auxiliary equipment limitations.

Exception No. 1 to (B), (C), and (D): For lampholders of infrared industrial heating appliances as provided in 422.14.
Exception No. 2 to (B), (C), and (D): For railway properties as described in 110.19.
Exception No. 3 to (D): Luminaires in installations where conditions of maintenance and supervision ensure that only qualified persons service the installation.

Substantiation: A. The panel rejected previous submissions on this topic due to the following:

The recommendation proposed would allow a luminaire with up to 430 V to be installed in a location where it could be easily accessed for changing lamps, etc. This defeats the intent of the requirement which is to require luminaires with voltage supplies higher than 277 V to be limited to very specific installation as described in 210.6(D)(1). There is no substantiation to allow luminaires supplied from pv systems to be treated any differently than luminaires power by AC line power.
1. The requirements of 210.6(D) are intended to protect non-qualified persons from the risk of electric shock while changing lamps, etc.
2. The use of listed electronic light ballasts that provide isolation between the ac or dc power source and the lamp circuit, and protection against electric shock are an alternate means of achieving this intent.
3. The proposed new language for 210.6(D)(3) would allow connection of listed, dc-rated ballasts to dc circuits operating between 277 and 600 V. Fluorescent lamp ballasts are listed under UL 935 which tests for and protects against the potential for electric shock when changing lamps. UL 935 applies to both ac and dc powered ballasts. UL 1029 applies to high intensity discharge ballasts and has similar provisions for the prevention of electric shock.
4. Most electronic ballasts can operate on both ac and dc as the internal electronics converts incoming power to dc before inverting to lamp voltage. Many are listed for both ac and dc use. A ballast connected to a 277 V ac nominal circuit will be subject to 392 V peak and 431 V peak at (+10%) ac high line. The internal DC bus of the ballast will be charged to the same (392 V dc) level whether the ballast is connected to 277 V ac or 392 V dc. The lamp is then supplied via an isolated high-frequency inverter circuit. The voltages available in the ballast and the risk of electric shock when changing bulbs are identical.
5. The potential risk to a person changing a ballast is a separate issue which is addressed by the new requirements of 410.73(G) requiring a ballast disconnect switch: “The luminaire will contain a disconnect means internal or external to itself or the luminaire will be cord and plug wired with UL rated hardware”. Ballast replacement is also an activity normally performed by qualified personnel.
6. Comments from luminaire manufacturers (in the 2005 ROP) in response to the changes in the 2003 code that excluded luminaires from operating at over 277 V stated that this change was occurring without justification - no problems or cases of electric shock had been reported for lighting systems operating at over 277 V.
B. The new Exception (3) to 210.6(D) provides consistency between 600 V and over 600 V requirements.
210.6(E) (Over 600 Volts Between Conductors) states: “Circuits exceeding 600 volts, nominal, between conductors shall be permitted to supply utilization equipment in installations where conditions of maintenance and supervision ensure that only qualified persons service the installation.”
This provision for over 600 V between conductors is also appropriate for the voltage range 277 to 600 V where the general use of luminaires was prohibited in the 2005 code. This exception would allow the use of luminaires operating above 277 V ac and dc where conditions of maintenance and supervision ensure that only qualified persons service the installation.

C. Industry and Societal Impact. DC assisted lighting systems work by supplying rectified ac power to new and existing lighting installations, with additional power provided (directly via diode coupling) from dc sources such as photovoltaics, fuel cells and wind-generators.

DC lighting systems of this type have been researched and operating reliably for more than 20 years. The first such system (a photovoltaic-assisted lighting system in a department store in Massachusetts) was installed by UMass Lowell and is still operating.

The change to the 2005 NEC to 210.6(D)(2) that excluded luminaries from supply voltages above 277 V has (perhaps inadvertently) made DC assisted lighting systems illegal, but DC assisted lighting systems for commercial and industrial buildings have the potential to significantly reduce US energy consumption.

There are more than 100 billion square feet of commercial and industrial space in the USA that is lit with fluorescent and HID lighting. Typical lighting density is 2 W/square foot (a total electric demand of about 200 GW - about 20% of the total generating capacity).

The advantages of these systems are:

1. Efficiency - energy from the dc power source is used directly without conversion to ac and back to dc again
2. Cost - the cost of inverters is eliminated
3. Interconnection barriers - there is no possibility of back-feeding the electric grid, and so there are no interconnection issues.

The inclusion of this proposal, or equivalent language, is important for the preservation of an existing, growing segment of the renewable-energy industry that can provide significant reductions in US energy demand. It is important for the future of our country.

Panel Meeting Action: Accept in Part

The panel accepts the submitter’s recommendation to add item (3) to 210.6(D).

The panel rejects the submitter’s recommendation to add a new Exception No. 3.

Panel Statement: The panel agrees with the specific language to allow the DC rated luminaire with the limitations as stated in the submitter’s recommendation.

The panel does not agree with adding a general exception that would allow luminaires to generally be applied above 277V. The limitations in 210.6(E) for qualified persons are specific to the limited application of the over 600 volt systems in branch-circuit applications. Applying this broadly to allow higher voltage luminaires in under 600V systems is not justified.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-22 Log #1144 NEC-P02
(210.8(A))

Final Action: Reject


Comment on Proposal No: 2-40

Recommendation: Reject Proposal 2-40 in its entirety.

Substantiation: Proposal 2-40 should be rejected due to the incorrect assumption that all refrigerators and freezers will operate on GFCI protected circuits/receptacles. Potential loss of food in refrigerators and freezers is still a major problem. Also, some refrigerators are still being sold with a warning label to not install the refrigerator on a GFCI protected circuit. See copy of a label below from a Frigidaire Upright Freezer tag.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: The product standard for refrigerators and freezers (UL 250) includes specific requirements for leakage current tests and limits the leakage current to 75mA. If there are situations where the appliance is leaking more than 5 times its permitted current to trip a GFCI, the condition with the appliance should be corrected. Relative to the “tags” mentioned in the substantiation, there is no evidence that these types of markings are not related to the historical issues associated with higher leakage currents and lower GFCI trip thresholds.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PURVIS, R.: Comment 2-22 should be accepted. Neither the submitter of Proposal 2-40, nor the members of CMP 2 submitted sufficient substantiation for the need to require GFCI protection for dedicated appliances in garages and basements. However, various comments submitted pointed out potential problems with nuisance trips due to lightning, leakage or whatever for refrigerators and freezers that could result in food loss. If these exceptions are eliminated, there is a real possibility that electrical contractors will later remove the GFCI (after inspection) or somehow make doubly sure that refrigerators and freezers are not on a GFCI protected circuit or receptacle.

2-23 Log #1346 NEC-P02
(210.8(A)(B))

Final Action: Reject

Submitter: Donald M. King, Wilmington, DE

Comment on Proposal No: 2-42

Recommendation: This proposal should have been accepted.

Substantiation: The hazards associated with the use of electricity in close proximity of a sink have been adequately substantiated by numerous proposals that have been submitted to Panel 2 in past Code cycles. Panel 2 has recognized these hazards in this code cycle with the panel action on Proposal 2-81. Proposal 2-81 revises 210.8(B)(5) to require GFCI protection for all receptacles installed within 6 feet of a sink in other than dwelling units. The same level of protection should be required for similar installations in dwelling units. The same electrical hazards exist where electricity is used in close proximity of a sink regardless of the type of occupancy.

Panel Meeting Action: Reject

Panel Statement: The revision to 210.8(A)(7) and 210.8(B)(5) cover the situation related to receptacles installed within 6 ft of sinks. The wording in the proposal relative to “tubs” is already covered through the bathroom requirement for GFCI protection. The wording “other body of water” in the proposal is too broad.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

KING, D.: The Panel action and statement does not satisfy the submitter’s concerns. With the present Code language in 210.8(A)(6) and 210.8(A)(7) it is possible in a dwelling unit to have a receptacle installed in a bathroom wall located more than 12 inches below the countertop surface and not have that receptacle be required to be GFCI protected. If a sink were installed in the countertop surface above the receptacle it is likely that the receptacle would be within 6 ft of the sink and the receptacle under the present code text would still not require GFCI protection. In the above scenario it is possible to utilize the receptacle for cord and plug connected equipment to be placed on the
counterpoint adjacent to the sink creating an unsafe condition for anyone using the electrical equipment. Accepting in Part the submitter’s original Proposal to require GFCI protection within 6 ft of any sink would have required GFCI protection for the installation above and satisfied the submitter’s concerns. I agree with the Panel that the wording in the Proposal “other body of water” is too broad but maintain my position that GFCI protection should be provided for all receptacles installed within 6 ft of any sink in a dwelling unit.

2-24 Log #1406 NEC-P02 Final Action: Reject
(210.8(A) Exception No. 2 to (2) and Exception No. 2 to (5)).

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 2-40
Recommendation: Revise text to read as follows: These proposals should have been rejected. The exceptions should remain for existing older appliances.

Substantiation: Nuisance tripping of the GFCI is not the only real issue here. The proposals also refer to leakage current in the appliances and state that appliances should not have this much leakage current. However, earlier NEMA guides stated that some appliances do have higher leakage currents and should not be used with GFCIs. Although the product standards have since changed and do not permit the higher leakage currents, many of the appliances listed under previous products standards are still in use and have not been shown by any substantiation to present a significant shock hazard to their users. The acceptance of this proposal seems to be based on the assumption that all appliances used in newer homes are listed under the newer standards. This is highly presumptuous. In effect, the acceptance of this rule says to all buyers of homes built after 1988 that they must replace their old appliances with respect to their ability to pay or the continued usability of those appliances. The author of this comment agrees that “readily accessible” is vague and no longer a valid reason for an exception, but the consumers should be able to continue to use major appliances until the useful life of the appliance is over.

Panel Meeting Action: Reject
Panel Statement: The requirements for limited leakage current are not a recent change and have been in the appliance standards for a number of years. The submitter also overlooks the fact that if the appliance has significant leakage current, it is a hazard and should be replaced.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-25 Log #1006 NEC-P02 Final Action: Reject
(210.8(A)(1)).

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: 2-45
Recommendation: Revise text to read as follows: (1) Bathrooms. The ground fault circuit interrupter receptacle or device, protecting a bathroom shall be located in the bathroom being protected or in a panelboard.

Substantiation: Mr. Jones’ and others’ argument that there is a problem with multiple bathrooms being served by one GFCI is not correct. In any regard to their ability to pay or the continued usability of those appliances. The author of this comment agrees that “readily accessible” is vague and no longer a valid reason for an exception, but the consumers should be able to continue to use major appliances until the useful life of the appliance is over.

Panel Meeting Action: Reject
Panel Statement: The requirements for limited leakage current are not a recent change and have been in the appliance standards for a number of years. The submitter also overlooks the fact that if the appliance has significant leakage current, it is a hazard and should be replaced.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-26 Log #1675 NEC-P02 Final Action: Reject
(210.8(A)(1)).

Submitter: Joseph Linten, Greg Brooks Electric

Comment on Proposal No: 2-46
Recommendation: Add new text:
All general-purpose receptacles shall be GFCI protected in bathrooms. This does not include laundry equipment such as washers and dryers.

Substantiation: Presently, there is relief for basements and garages, I believe this relief should apply to bathrooms. This change would also prevent nuisance tripping.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree that the appliances located in a bathroom should be exempt from GFCI protection. These appliances are compatible with GFCI, and if they are tripping the GFCI, they have leakage current that is in excess of acceptable levels. The submitter has not substantiated his statement regarding nuisance tripping.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-27 Log #1052 NEC-P02 Final Action: Reject
(210.8(A)(2)).


Comment on Proposal No: 2-41
Recommendation: The panel should reconsider their action to accept this proposal.

Substantiation: The statement that “readily accessible is too vague” is bogus, and has the panel considered that the garage door operation is essential to many disabled persons as well as a vital part of home security and a ready and easy fire exit. These openers are listed and are equipped with 3-wire attachment caps. I thought it was necessary to provide substantiation for a NEC change. I see none. In addition, the exception that permits fire and burglar alarm systems to be supplied from a non-GFCI circuit remains, Why? The only reason would be “nuisance tripping” which is a concern for the garage door opener.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree with exempting receptacles at elevated locations from GFCI protection. In many cases, these receptacles supply equipment that is located in a readily accessible location of a garage that should require GFCI protection. There is no incompatibility between garage door openers and GFCIs.

Number Eligible to Vote: 12
Articul Rejected: Affirmative: 11 Negative: 1

Explanation of Negative: PURVIS, R.: Comment 2-27 should be accepted. Neither the submitter of Proposal 2-41, nor the members of CMP 2 submitted sufficient substantiation for the need to require GFCI protection for receptacles that are not accessible (garage door opener for example). However, the comment submitted pointed out valid potential life safety problems with requiring GFCI protection due to nuisance trips.

2-28 Log #2031 NEC-P02 Final Action: Accept
(210.8(A)(2) Exception No. 1).

Submitter: Donald Cook, Shelby County Building Inspections

Comment on Proposal No: 2-45
Recommendation: I support the panel action on this proposal.

Substantiation: A circuit with potentially lethal leakage current capable of opening a GFCI protective device, should not be considered a “nuisance trip” by the electrical industry.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: PURVIS, R.: Comment 2-28 should be rejected. Neither the submitter of Proposal 2-50, nor the members of CMP 2 submitted sufficient substantiation for the need to require GFCI protection for receptacles that are not accessible (garage door opener for example). However, Comment 2-27 pointed out valid potential life safety problems with requiring GFCI protection due to nuisance trips.

2-29 Log #896 NEC-P02 Final Action: Reject
(210.8(A)(2) Exception No. 1 and 210.8(A)(5) Exception No. 1).

Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc.

Comment on Proposal No: 2-41
Recommendation: Reject this proposal: restore wording to 2005 NEC language.

Substantiation: The proposal submitter states that “readily accessible” can mean different things based upon the height of the person. But the wording of 210.8(A)(2) Exception No. 1 and 210.8(A)(5) Exception No. 1 is referring to not readily accessible, which is something quite different.

“Readily accessible” refers to the ability of anyone, regardless of height or mobility, to access the equipment or device in question. This term needs to be vague to allow or require items to be at the height of the user. This is why the definition of readily accessible in Article 100 has remained unchanged during several Code cycles.
The intent of the phrase “not readily accessible” was to prevent anyone from reaching equipment or a device without resorting to ladders to achieve the height. It, therefore, is directed at the nominal height of a person, and in several locations such as 240.2(A)(4) has been placed at no less than 6 ft 7 in. above the floor. This was thought to be a practical height to require those who ready access is required to resort to ladders to achieve this height, even though persons of greater height could reach it without aid.

See 210.8(A)(3) Exception, which permits the elimination of GFCI protection for receptacles feeding electric snow-melting equipment. In order to follow 420.28, ground-fault circuit-interrupter (GFCI) protection during the heating season, providing shock hazard to anyone coming in contact with the receptacle, but providing proper protection for the snow-melting system. The intent of this “not readily accessible” requirement though no height is mentioned, expects this to be at the roof line where the average person would not be exposed to possible deadly current.

In 110.34(E) we use specific heights based upon the voltage level to prevent access by unqualified persons from unguarded voltages above 600V. There is no adjustment in these distances based upon the height of the person because of this non readily accessible height should provide “…practical safeguarding from the hazards arising from the use of electricity” [90.1(A)].

Panel Meeting Action: Reject
Panel Statement: See action and statement on Comment 2-27.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:

PURVIS, R.: Comment 2-29 on Proposal 2-4 should be accepted for the same reason that Comment 2-27 should have been accepted.

2-30 Log #2132 NEC-P02 Final Action: Reject
(210.8(A)(2) Exception No. 1 and No. 2)
Submitter: Michael R. Fisher, Bluhm Electric Inc.
Comment on Proposal No: 2-50
Recommendation: Exception No. 1 to (2) Receptacles that are not readily accessible.

Substantiation:
As the proposer talks about leakage current for appliances. But does not address the issue of lightning. In Colorado, we are second in lightning problems with nuisance trips due to lightning, leakage, or whatever for refrigerators and freezers that could result in food loss. If these exceptions are eliminated, there is a real possibility that electrical contractors will later remove the GFCI (after inspection) or somehow make doubly sure that refrigerators and freezers are not on a GFCI protected circuit or receptacle.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-27. GFCIs produced in recent years under the revised standards are much more resistant to lightning as a cause for unwanted tripping. In addition, there are actions such as freezer temperature alarms and similar devices that could be used to warn of a power outage for any reason (not just a GFCI opening).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:

PURVIS, R.: Comment 2-30 should be accepted which would reject Proposal 2-50. The need for GFCI protection was not substantiated. Many new homeowners would not be aware that they might have to purchase some type of warning device for power loss due to false trips from lightning etc. if GFCI protection is required on these circuits.

2-31 Log #2030 NEC-P02 Final Action: Accept
(210.8(A)(2) Exception No. 2)
Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 2-51
Recommendation: I support the panel action on this proposal.

Substantiation:
A circuit with potentially lethal leakage current capable of opening a GFCI protective device, should not be considered a “nuisance trip” by the electrical industry.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:

PURVIS, R.: Comment 2-31 on Proposal 2-51 should be rejected. Neither the submitter of the proposal, nor the members of CMP 2 submitted sufficient substantiation for the need to require GFCI protection for dedicated appliances in garages. also new spec’s on refrigerator recommend that these appliances not be put on AFCI receptacles.

2-32 Log #2029 NEC-P02 Final Action: Accept
(210.8(A)(5) Exception No. 1 to (5))
Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 2-58
Recommendation: I support the panel action on this proposal.
Substantiation: A circuit with potentially lethal leakage current capable of opening a GFCI protective device, should not be considered a “nuisance trip” by the electrical industry.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Substantiation:

2-33 Log #2028 NEC-P02 Final Action: Accept
(210.8(A)(5) Exception No. 2 to (5))
Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 2-57
Recommendation: I support the panel action on this proposal.
Substantiation: A circuit with potentially lethal leakage current capable of opening a GFCI protective device, should not be considered a “nuisance trip” by the electrical industry.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:

PURVIS, R.: Comment 2-33 on Proposal 2-57 should be rejected. Neither the submitter of the proposal, nor the members of CMP 2 submitted sufficient substantiation for the need to require GFCI protection for dedicated appliances in basements. However, various comments submitted pointed out potential problems with nuisance trips due to lightning, leakage, or whatever for refrigerators and freezers that could result in food loss. If these exceptions are eliminated, there is a real possibility that electrical contractors will later remove the GFCI (after inspection) or somehow make doubly sure that refrigerators and freezers are not on a GFCI protected circuit or receptacle.

2-34 Log #1997 NEC-P02 Final Action: Accept in Principle
(210.8(A)(5) Exception No. 3)
Submitter: Lawrence Brown, National Association of Home Builders (NAHB)
Comment on Proposal No: 2-58
Recommendation: Accept the proposed change.
Substantiation: It may be advisable to include this cross-reference FPN in Chapter 2 as most electricians who wire one- and two-family dwellings and low-rise multifamily buildings very rarely use the provisions of Chapter 7. In addition, NAHB would like to make sure this important information is included in the electrical provisions of the ICC International Residential Code (IRC).

Panel Meeting Action: Accept in Principle
Recommendation: Add an FPN to 210.8(A)(5) following the exception that reads:

“FPN: See 760.41(B) and 760.121(B) for power supply requirements for fire alarm systems.”

Panel Statement: The panel accepts the recommendation to add the FPN and has reordered the FPN to reference the correct sections and make the FPN generic relative to power supply requirements.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-35 Log #809 NEC-P02 Final Action: Hold
(210.8(A)(7))
TC Action: The Technical Correlating Committee directs that this comment be reported as “Hold” since the revision to 210.8(A)(7) is a new material that has not had adequate public review and the Technical Correlating Committee directs that only Comment 2-35 be held.
Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 2-40
Recommendation: Revise text to read:
(7) Laundry, utility, bedroom and wet bar sinks, where the receptacles are installed within 1.8 m (6 ft) of the outside edge of the sink.

Substantiation: Bedroom sinks are quite common in current construction where a vanity with sink is installed in addition to a bathroom for a master bedroom. It can be argued that the sink is in the bathroom area or can be used as a wet bar but the addition of the word bedroom would eliminate the question of a double sink.

Panel Meeting Action: Accept in Principle
Reword 210.8(A)(7) from the ROP text to read as follows:
(7) Laundry, utility, wet bar and similar sinks — where the receptacles are installed within 1.8 m (6 ft) of the outside edge of the sink.”
Panel Statement: The panel has revised the language to include “similar sinks” to address the submitter’s concern. The proposed text of “bedroom sink” is not a common term. The language in the panel action text will make the requirement inclusive of all sinks other than those covered by the bathroom and kitchen provisions of 210.8(A) and (A)(6).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-36 Log #11 NEC-P02

(210.8(A)(7) Exception)

Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 2-66

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered since the acceptance of two other proposals is not a technical reason for rejecting this proposal in accordance with the 4.3.5.1 of the NFPA Regulations Governing Committee Projects.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the Technical Correlating Committee direction to reconsider the proposal. The panel continues to reject the proposal. The panel does not agree that the exceptions should be added for equipment located in the areas covered by the requirements. The panel notes that the submitter’s original substantiation was simply that the exception exists in other 210.8 locations and should be added here. This substantiation is insufficient to expand the use of the exceptions.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-37 Log #12 NEC-P02

(210.8(A)(7) Exception)

Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 2-67

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered since the acceptance of two other proposals is not a technical reason for rejecting this proposal in accordance with the 4.3.5.1 of the NFPA Regulations Governing Committee Projects.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the Technical Correlating Committee direction to reconsider the proposal. The panel continues to reject the proposal. The panel does not agree that the exceptions should be added for equipment located in the areas covered by the requirements. There is no basis to exclude the equipment that is supplied for receptacles within the 6 ft space. The panel notes that the original need for the substantiation was based on higher leakage currents in appliances and lower trip thresholds for GFCIs. For a number of years, the equipment leakage provisions and the minimum trip levels of the GFCI have been well coordinated, and as such expansion of the use of the exceptions is not warranted.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-38 Log #10 NEC-P02

(210.8(A)(7) Exception No. 1 and No. 2 (New))

Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 2-65

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered since the acceptance of two other proposals is not a technical reason for rejecting this proposal in accordance with the 4.3.5.1 of the NFPA Regulations Governing Committee Projects.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the Technical Correlating Committee direction to reconsider the proposal. The panel continues to reject the proposal. The panel does not agree that the exceptions should be added for equipment located in the areas covered by the requirements. The panel notes that the submitter’s original substantiation was simply that the exception exists in other 210.8 locations and should be added here. This substantiation is insufficient to expand the use of the exceptions.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-39 Log #13 NEC-P02

(210.8(B))

Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 2-70

Recommendation: The Technical Correlating Committee understands that the Panel Action on this Proposal retained “(3) Roofops”; revised (4) to read “(4) Outdoors”, deleted the existing text in (4), changed the existing “Exception to (3) and (4)” to “Exception No. 1 to (3) and (4)”, and added the proposed “Exception to (3)” as “Exception No. 2 to (4)”; and deleted (5).

The Technical Correlating Committee directs that the Action on this Proposal be rewritten to comply with 4.1.1 of the NEC Style Manual. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the Technical Correlating Committee as follows:

Revise Exception No.1 to (3) and (4) to read as follows: “Exception No. 1 to (3) and (4): Receptacles that are not readily accessible and are supplied from a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed without GFCI protection.”

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-40 Log #1347 NEC-P02

(210.8(B))

Final Action: Accept in Principle in Part

Submitter: Donald M. King, Wilmington, DE

Comment on Proposal No: 2-70

Recommendation: Delete the proposed industrial exception as recommended by Panel 2, add specific section references to the exception to (3) to satisfy the TCC action and revise the submitter’s recommended text to read as follows:

Final Action: Accept

(B) Other Than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) though (5) shall have ground-fault circuit-interrupter protection for personnel:

(1) Bathrooms

(2) Commercial and institutional kitchens for the purposes of this section, a kitchen is an area with a sink and permanent facilities for food preparation and cooking.

(3) Roofops

(4) Outdoors in public spaces for the purposes of this section, a public space is defined as any space that is for use by, or is accessible to, the public.

Exception to (2) and (3): Receptacle that are not readily accessible and are supplied from a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.

(5) Outdoors where installed to comply with 210.63

(4) Outdoors.

Exception to (3) and (4): Receptacles that are not readily accessible and are supplied from a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Part I of Article 426.

Substantiation: The addition of an industrial exception by Panel 2 that allows an assured equipment grounding program to be used in lieu of GFCI protection was done without reviewing any technical data that would indicate that an assured equipment grounding program would provide the same level of shock protection as GFCI protection. Industrial establishments present some of the most adverse conditions and environments for persons who are required to operate cord and plug connected equipment. Oftentimes, workers are required to work outside in inclement weather for extended periods of time while utilizing portable cord and plug connected electrical equipment, exposing them to the hazard of electrical shock or electrocution. There are also many situations that require workers at industrial facilities to work in areas that are below grade, such as manholes and cable vaults, further subjecting them to risk of electrical shock or electrocution. The use of GFCI protected devices would greatly reduce the hazard of electrical shock or electrocution in these areas.

GFCI protected devices have a proven history of saving lives and should be required for all 125 volt 15 and 20 ampere receptacle outlets installed outdoors including those installed in Industrial establishments.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Number Eligible to Vote: 12
The panel accepts in principle the revision to Exception No. 2 by rewording 20.8(B)(4) of the ROP text. The panel action on Comment 2-39 accomplishes this objective. Panel Statement: The panel does not agree with the deletion of Exception No. 2 from the ROP text. The assured equipment grounding conductor program is recognized by OSHA as well as the NEC in Article 590. See the panel action on Comment 2-41 that futhers the exception to the text used in 590.6(A) Exception. See panel action and statement on Comment 2-39 for the revision of Exception No. 1. The panel has removed the entire reference to Article 426, since the article would apply to the equipment regardless of the reference. Number Eligible to Vote: 12 Ballot Results: Affirmative: 12

Comment on Affirmative: NENNINGER, B.: In keeping an industrial exception for outdoor receptacles, Panel 2 has appropriately recognized specific industrial situations in which a “greater hazard” could result from the loss of power. Examples of such situations include: receptacles for equipment supplying breathing air during confined space entry, air evacuation/supply where gases may be present, and equipment held in place using electro-magnetic technology such as magnetic drills.

Panel Meeting Action: Accept in Principle in Part The panel rejects the recommendation to delete Exception No. 2 to 210.8(B)(4) of the ROP text. The panel accepts in principle the recommendation to reword Exception No. 1 to (3) and (4) of 210.8(B)(4) of the ROP text to not reference the entire article. The panel action on Comment 2-39 accomplishes this objective. Panel Statement: The panel accepts in principle the recommendation to include the reference to 210.63 in the outdoor requirement. Panel Statement: The panel has revised Exception No. 2 to mirror the language used in 590.6(A) Exception. This will accomplish the objective of the submitter to make the use of the assured equipment grounding conductor program consistent. The panel does not accept the deletion of rooftops because there may be receptacles installed on rooftops (such as those in a penthouse) that are rooftop receptacles but are not located outdoors. In addition, those receptacles may not be for compliance of 210.63, so the use of that reference may again leave gaps in the intended protection. Number Eligible to Vote: 12 Ballot Results: Affirmative: 12

2-41 Log #1358 NEC-P02 Final Action: Accept in Principle in Part (210.8(B))

TCC Action: The Technical Correlating Committee understands that the panel action did not accept the deletion of “Exception No. 1 to (3) and (4)”.
Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc
Comment on Proposal No: 2-70 Recommendation: Revise text to read as follows:
(B) Other Than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through (5) shall have ground-fault circuit-interrupter protection for personnel:
(1) Bathrooms
(2) Commercial and institutional kitchens—for the purposes of this section, a kitchen is an area with a sink and permanent facilities for food preparation and cooking (2) Outdoors. For the purpose of this section, a public space is defined as any space that is for use by, or is accessible to, the public
(3) Commercial and institutional kitchens. Receptacles that are not readily accessible and are supplied from a dedicated branch circuit for electric snow melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.
(5) Outdoors, where including recepctacles installed to comply with 210.63 Exception to (3): Receptacles that are not readily accessible and are supplied from a dedicated branch circuit for electric snow melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.
[Panel Action] Exception No. 2 to (4): In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified personnel are involved, GFCI protection shall not be required on receptacles that are limited in use to those receptacles listed in 590.6(A) Exception equipment qualified under an assured equipment grounding conductor program as specified in 590.6(B)(2).
Substantiation: I agree with the inclusion of all 125-volt, 15- and 20-ampere receptacles installed with GFCI protection. I do not agree that “roofops” is not “outdoors”, but the added wording “including receptacles installed to comply with 210.63” should cover the problem addressed in the panel statement.
The panel action that added 210.8(B)(4) Exception No. 2 should refer to 590.6(A) Exception allows an assured equipment grounding conductor program only if the receptacle is 125-volt, 15-, 20-, or 30-ampere that “...would create a greater hazard if power was interrupted or having a design that is not compatible with GFCI protection”. This follows the intent of 590.6(A) Exception in that it protects persons using electricity with almost all temporary wiring. 590.6(B) gives an option for receptacles other than 125-volt, 15-, 20-, or 30-ampere to use either GFCI protection or an assured equipment grounding conductor program. 590.6(A) Exception refers to 590.6(B)(2) for the requirements of the assured equipment grounding conductor program, not which receptacles would be covered.
There does not appear to be a substantiation for exempting all 125-volt, 15- and 20-ampere receptacles in industrial establishments from GFCI protection by merely using an assured equipment grounding conductor program.
Panel Meeting Action: Accept in Principle in Part
The panel accepts in principle the revision to Exception No. 2 by rewording as follows: “Exception No. 2 to (4): In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power is interrupted or having a design that is not compatible with GFCI protection.”
The panel rejects the recommendation to delete rooftops.
Panel Meeting Action: Accept in Principle
The panel accepts in principle the recommendation to include the reference to 210.63 in the outdoor requirement.
Panel Statement: The panel has revised Exception No. 2 to mirror the language used in 590.6(A) Exception. This will accomplish the objective of the submitter to make the use of the assured equipment grounding conductor program consistent.
The panel does not accept the deletion of rooftops because there may be receptacles installed on rooftops (such as those in a penthouse) that are rooftop receptacles but are not located outdoors. In addition, those receptacles may not be for compliance of 210.63, so the use of that reference may again leave gaps in the intended protection.
Number Eligible to Vote: 12 Ballot Results: Affirmative: 12

2-42 Log #1801 NEC-P02 Final Action: Accept in Principle (210.8(B))
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 2-71 Recommendation: The panel should amend its action and reject the expansion of GFCI’s to sinks in “industrial laboratories” by adding an exception to the newly proposed text, “(5) Sinks – where receptacles are installed within 1.8 m (6 ft) of the outside edge of sink” as follows: Exception: Receptacles in industrial laboratories.
It should be noted the new text was offered by panel 2 in proposal 2-81 and referenced by the panel to address in principal in part the submitters request in proposal 2-71.
Substantiation: The blanket reference to all sinks including industrial laboratory facilities is of concern due to a potential loss of power to critical lab equipment used to control (cool, heat, stir/agitate) process reactions and evacuate process gases. Loss of power to such equipment either from a nuisance or intentional GFCI trip may result in significant run-away reaction hazards depending on the process characteristics and/or gases produced. These hazards include fire for those hood installations classified as division 2. In addition, leaving the text “industrial laboratories” out does not preclude the use of GFCI in such locations where they do not contribute to the hazards referenced above.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 2-44.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explaination of Negative: KING, D.: See my explanation of negative on Comment 2-44.
Comment on Affirmative: NENNINGER, B.: By accepting an exception covering sinks in industrial laboratories, Panel 2 has appropriately recognized situations where “greater hazards” exist in the event power is lost to critical lab equipment used in proximity to sinks. Examples of such equipment include devices designed to control process reactions and evacuate process gases. In these cases, a GFCI trip (nuisance or intentional) could result in significant run-away reaction hazards depending on the process characteristics and/or gases produced.

2-43 Log #1849 NEC-P02 Final Action: Reject (210.8(B))
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 2-70 Recommendation: Accept the Proposal as originally submitted.
Substantiation: I agree with Mr. Weber’s comment. Industrial workers are often exposed to the same hazards as non-industrial workers. Considering the fact that the performance requirements of the assured program are seldom adhered to, we are putting our industrial workforce in an unnecessary danger.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree that the permission to use the assured equipment grounding conductor program should be removed. This program is still recognized by OSHA as acceptable if properly applied. The panel has revised the exception to be consistent with the wording of 590.6(A) Exception, which further limits the use of the exception. See the panel action and statement on Comment 2-41.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
2-44 Log #571 NEC-P02 Final Action: Accept in Principle (210.8(B) Exception (New))

TCC Action: The Technical Correlating Committee directs that the new Exception added in the panel action be identified as “Exception No. 1 to (5) to correlate with the Technical Correlating Committee action on Comment 2-57.

The Technical Correlating Committee understands that the panel action on Comment 2-57 modifies this panel action.

Submittor: William M. Lewis, Martinsville, IN

Comment on Proposal No: 2-71

Recommendation: The additional requirement for GFCI protection should be accompanied by the following exception:

Exception: Where location of power could lead to more serious consequences than electrical shock, such as runaway reactions endangering multiple personnel or buildings, GFCI protection shall not be required.

Substantiation: Reasoning for this exception is obvious. It has long been the standard of the company from which I retired, to install GFCIs where employees request them, but not routinely in lab hoods or near lab sinks. Sometimes reliability and safety for the masses, outweighs individual safety.

Panel Statement: The panel has added wording to this is more consistent with code language and meets the intent of the submitter.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: KING, D.: The hazards which are described in the submitter’s substantiation would require back up power sources to prevent “a dangerous runaway reaction” regardless of whether GFCI Protection is used or not. The submitter has not substantiated that there is a compatibility issue with electrical equipment used in labs and listed GFCI devices. Panel 2 should have requested to see more technical data before adding this exception.

Comment on Affirmative: NENNINGER, B.: See my explanation given in Comment 2-42.

2-45 Log #1765 NEC-P02 Final Action: Reject (210.8(B) Exception and 210.8(C) Exception (New))

Submittor: Michael Cole, MRC Electric

Comment on Proposal No: 2-70

Recommendation: Add an Exception to read as follows: Exception e to 210.8(B) and 210.8(C): For loads that are incompatible with GFCI protection for people such as truck engine block heaters, older refrigerators, older vending machines, older boat hoists, large boat hoists, and similar equipment, a ground fault/ground check relay of the type that is used for protection of cords and machines in mines shall be permitted. The ground fault trip of such a device shall be permitted to be adjustable from 0.1 amperes to 10 amperes and shall be adjusted to the lowest level that tolerates normal leakage current of the appliance or machine. The ground check circuit shall be able to detect an open equipment grounding conductor and ground fault of the ground check conductor. For cords that do not lie on the floor or when bridge crane runway conductors or festoon cords are used to supply an appliance or machine, the power circuit shall be solidly grounded or resistance grounded and the cord shall be permitted to be protected for voltages of 600 volts or less. The power circuit is solidly grounded, the ground check relay shall be protected from the voltage drop in the equipment grounding conductor that occurs during a ground fault by means of a fused communications protector block. This method of protection shall also be permitted for cords that lie on indoor floors that are not subject to flooding. Washdown while the cord is in use, or presence of sharp objects. This method shall also be permitted for outdoor cords that do not lie on the floor and supply an appliance or machine that is stationary when in use. Where a cord lies on the floor and is subject to flooding, washdown, or sharp objects the cord power and ground check conductors shall be shielded regardless of voltage and the power source shall be resistance grounded regardless of voltage or number of phases.

Substantiation: a. One of the problems with the engine block heaters in diesel trucks is that at 55 miles per hour salt water will force its way into the wiring causing a leakage current that will trip a ground fault circuit interrupter for people protection. This is no more of a hazard than how if you do not ground a 15 horsepower hoist motor the hoist ropes will have a nasty tingle voltage regardless of how good the insulation is.

b. The method that is used in surface mines and underground mines for voltages up to 13,800 volts resistance grounded is to use continuous monitoring of the equipment ground which allows ground fault protection to be set to trip at much higher levels than 6 milliamperes.

The combination of resistance grounding and shielding of cord conductors protects against cord cuts and broken wire strands working their way through insulation to the surface (causing and electrocution) or to the other conductor (causing a fire). Resistance grounding makes the ground fault almost totally nonincendive and allows the ground fault relays and electricians to locate and clear the ground fault. This cause of electrocutions and fires was determined by the British National Coal Board among other regulatory agencies. The British have not had an electrocution in their underground coal mines since 1964 and they have 1,100 volt and 3,300 volt extension cords so they must be doing something right. The only electrical fires that they have had since then have been due to an operator of a machine running over the machine’s supply cord. Resistance ground also provides substantially reduced arcing hazard. There still is a way to have a phase to phase arcing ground fault but such a fault almost always branches to ground which would trip ground fault protection that required 10 amperes or less.

A company in Pennsylvania named Bender does this technology up to 4,160 volts resistance grounded. Bender has been advertising in the online e-mail newsletter from Electrical Construction and Maintenance magazine. A company in West Virginia named Service Machine Corporation does this technology up to 13,800 volts resistance grounded. There really is such a thing as a 400 ampere, 13,800 volt extension cord that is electrocution proof and fire proof and as safe as breakfast food as long as nobody runs over it with a mining machine. But then, you could choke on your breakfast food. c. The present generation of ground fault/ground check relays are not listed for solidly grounded electrical systems but that problem can be fudged using a fused communication protector block. This gives a way to do a simpler power system for machines in areas where cords are not abused or subject to moisture that could lead to electrocution.

Panel Meeting Action: Reject

Panel Statement: The submitter’s concept that an adjustable relay of 0.1 to 10 amperes be used as a substitute for GFCI protection at 120 V is technically flawed. The research associated with protection from electrocution is well established, and the panel notes that ground fault currents above 10 mA are above the let-go threshold and currents up to 50 mA induce ventricular fibrillation. Equipment that is leaking current in the ranges stated by the submitter can pose a significant hazard to persons.

In addition, the main requirement is to provide GFCI protection of the 15 and 20 ampere receptacles. The submitter’s concept is dependent upon special cord sets (many of which would not be cord and plug connected to a 15 or 20A receptacle), and there is no way to limit the receptacle to those applications.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-46 Log #940 NEC-P02 Final Action: Reject (210.8(B) Exception No. 2)

Submittor: Robert G. Fahey, City of Evansville

Comment on Proposal No: 2-70

Recommendation: Delete the following text: Exception No. 2: In industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified personnel are involved.

GFCI protection shall not be required on receptacles that are limited to use with equipment qualified under an equipped environment equipment grounding conductor program as specified in 500.6(B)(2).

Substantiation: I believe the proposed new Exception No. 2 should be omitted from the 2008 NEC. I have inspected industrial plants where the maintenance is, in fact, done by qualified people, but I have not noticed the assured equipment grounding program utilized, most cords used do not have the color coded tape as required by OSHA. I believe the GFCI protection is a better, more assured method of protecting the workers in all facilities, therefore, I believe the proposed new Exception No. 2 is set for 0 amperes or less.

Panel Meeting Action: Reject

Panel Statement: See panel actions and statements on Comments 2-41 and 2-43.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: KING, D.: See my explanation of negative on Comment 2-43.

2-47 Log #1307 NEC-P02 Final Action: Reject (210.8(B) Exception No. 2)

Submittor: Joseph A. Hertel, Safety and Buildings

Comment on Proposal No: 2-70

Recommendation: Delete proposed Exception No. 2

Substantiation: The Code Panel has done a commendable job in revising this section. Inclusion of the proposed Exception can negate any gains. GFCI technology has proven its worth and to allow other than a protected circuit based on a qualified person or assured grounding program defeats the purpose.
Panel Meeting Action: Reject
Panel Statement: See panel actions and statements on Comments 2-41 and 2-43.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative:
KING, D.: See my explanation of negative on Comment 2-43.

2-48 Log #14 NEC-P02 (210.8(B)(2)) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-72
Recommendation: The Technical Correlating Committee directs that the Panel reconsider the proposal and correlate with the Panel Action on Proposal 1-36. This action will be considered by the Panel as a Public Comment. The Technical Correlating Committee understands that the Panel Action on Proposal 2-73 modifies the Panel Action on this Proposal.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to reconsider the proposal and correlate with the action on Proposal 1-36. The panel action on Comment 2-5 accepts Proposal 1-36 and deletes the text of the definition from 210.8(B)(2). See also the panel action on Comment 2-50 that further revises the text of 210.8(B)(2).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-49 Log #15 NEC-P02 (210.8(B)(2)) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-73
Recommendation: The Technical Correlating Committee directs that the Panel reconsider the proposal and correlate with the Panel Action on Proposal 1-36. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to reconsider the proposal and correlate with the action on Proposal 1-36. The panel action on Comment 2-5 accepts Proposal 1-36 and deletes the text of the definition from 210.8(B)(2). See also the panel action on Comment 2-50 that further revises the text of 210.8(B)(2).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-50 Log #1357 NEC-P02 (210.8(B)(2)) Final Action: Accept in Principle
Submitter: Michael P. O'Quinn, MOGO Enterprises, Inc.
Comment on Proposal No: 2-72
Recommendation: Revise text to read as follows:
(B) Other Than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through (5) shall have ground-fault circuit-interrupter protection for personnel:
(1) Bathrooms
(2) Commercial and institutional "kitchens" for the purposes of this section; a kitchen is an area with a sink and permanent facilities for food preparation and cooking
Substantiation: With the addition of the term kitchen in Article 100: “An area with a sink and permanent facilities for food preparation and cooking” [ROP 1-36], the reminder of the text in 210.8(B)(2) is redundant.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to reconsider the proposal. The panel accepts the proposal. The provision for GFCI protection has been extended to all outdoor receptacles through the action on Proposal 2-70. The submitter has not substantiated exempting receptacles in spaces over the 10 ft particularly since those receptacles could still be supplying equipment that is accessible to the public.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-51 Log #811 NEC-P02 (210.8(B)(3)) Final Action: Reject
Submitter: Ray C. Mullin, Ray C. Mullin Books
Comment on Proposal No: 2-70
Recommendation: This is an editorial comment.
Delete: (3) Rooftops
Move present (4) to become (3).
Substantiation: We continue to try to make the NEC more “user friendly”. I propose to delete (3) since to my knowledge, all rooftops are located outdoors, (3) Rooftops is redundant.
Panel Meeting Action: Reject
Panel Statement: The panel does not accept the deletion of “rooftops” since there may be receptacles serving the rooftop but the receptacle itself is not located outdoors.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-52 Log #16 NEC-P02 (210.8(B)(4)) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-79
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered since the acceptance of two other proposals is not a technical reason for rejecting this proposal in accordance with the 4.3.5.1 of the NFPA Regulations Governing Committee Projects.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to reconsider the proposal. The panel rejects the proposal. The provision for GFCI protection has been extended to all outdoor receptacles through the action on Proposal 2-70. The submitter has not substantiated exempting receptacles in spaces over the 10 ft particularly since those receptacles could still be supplying equipment that is accessible to the public.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-53 Log #17 NEC-P02 (210.8(B)(4)) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-70
Recommendation: This is an editorial comment.
Delete: (3) Rooftops
Move present (4) to become (3).
Substantiation: We continue to try to make the NEC more “user friendly”. I propose to delete (3) since to my knowledge, all rooftops are located outdoors, (3) Rooftops is redundant.
Panel Meeting Action: Reject
Panel Statement: The panel does not accept the deletion of “rooftops” since there may be receptacles serving the rooftop but the receptacle itself is not located outdoors.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-54 Log #1032 NEC-P02 (210.8(B)(5) (New)) Final Action: Accept in Principle
Submitter: Philip Kercher, Sacred Heart Medical Center
Comment on Proposal No: 2-81
Recommendation: I am opposed to this proposed new text which would require GFCI outlets within 6 ft of sinks. As a Healthcare Facility Manager for 24 years, my experience indicates increasing the distance is unnecessary.
Substantiation: Strongly opposed to the proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 2-57.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
This Exception applies to new item (5) only and would not apply to patient facilities, other than those covered under 20.8(B)(5) Exception (New) to be GFCI protected. This Exception addresses the submitter’s concern that considering the bathroom area under 20.8(B)(5) are still required care areas of health care facilities, but has provided wording that receptacles not be required.

**Panel Meeting Action:** Accept in Principle
**Panel Statement:** See panel action and statement on Comment 2-57.
**Number Eligible to Vote:** 12
**Ballot Results:** Affirmative: 12

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Add an Exception proposed (5) to read:
(5) Laundry, utility, and wet bar sinks - where the receptacles are installed with 6 ft of the outside edge of the sink.

**Panel Meeting Action:** Reject
**Panel Statement:** The submitter’s recommendation is unclear. The recommended language is from the ROP text, but the substantiation indicates that a “Number 6” should be added.
**Number Eligible to Vote:** 12
**Ballot Results:** Affirmative: 12

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Substantiation: Handwashing sinks are typically located within 6 ft of the patient bed, exam table, gurney location, or treatment facility and this new language would require receptacles serving patient care life support, monitoring, and other portable patient care equipment to be on GFCI. The risk to a patient’s life and/or the treatment being rendered could be severely jeopardized by having an interruption of electrical power. Sinks for clinical staff handwashing are required in all patient rooms, treatment rooms and areas, and exam facilities by federal, state and local standards. This Exception applies to new item (5) only and would not apply to patient bathrooms.

**Panel Meeting Action:** Accept in Principle
**Panel Statement:** See the panel action and statement on Comment 2-57.
**Number Eligible to Vote:** 12
**Ballot Results:** Affirmative: 12

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**Panel Meeting Action:** Accept in Principle
**Panel Statement:** See the panel action and statement on Comment 2-57.
**Number Eligible to Vote:** 12
**Ballot Results:** Affirmative: 12

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**Panel Meeting Action:** Accept in Principle
**Panel Statement:** See the panel action and statement on Comment 2-57.
**Number Eligible to Vote:** 12
**Ballot Results:** Affirmative: 12

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2-61 Log #2134 NEC-P02
(210.8(B)(6))
Final Action: Reject
Submitter: Geoffrey Wood, Hampton, NH
Comment on Proposal No: 2-81
Recommendation: Add new text to read as follows:
Janitorial, Services and Utility Closets. For the purpose of this section a janitorial service or utility closet, is a closet which contains a floor level mop basin (slop sink) wall mounted mop basin or any other basin
Substantiation: I think you should have to put a GFCI in janitorial closets or utility closets. The potential for electrical shock is the same as if you were in a kitchen or bathroom, etc. They should be treated the same.
Panel Meeting Action: Reject
Panel Statement: The provisions described by the submitter are already covered in the requirement for 210.8(B)(5) that receptacles within 6 ft. of a sink be GFCI protected. This would include sinks in janitorial closets.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-62 Log #1887 NEC-P02
(210.8(D) (New))
Final Action: Reject
Submitter: Paul S. Hamer, Richmond, CA
Comment on Proposal No: 2-88
Recommendation: This proposal (and its companion Proposals 2-6, 2-285, 11-48 and 11-49 - Comments submitted separately) should be accepted. Add to the end of the proposed wording: This requirement shall become effective January 1, 2011. This aligns with Mr. Weber’s Explanation of Negative for Proposal 2-88 regarding the development of new, life-saving concepts. Adding the delayed effective date would provide the incentive and the necessary time for the Three-Phase Ground-Fault Circuit-Interrupter System (GFCIS-3Ph) to be further developed and commercialized.
Substantiation: The Panel Statement includes “...The submitter’s substantiation notes that the hazard is when unqualified persons work on equipment without taking the appropriate precautions to deenergize the circuit and verify that circuit is disconnected...”. There are numerous instances where unqualified persons were electrocuted by faulty or defective equipment (see the supporting material submitted with the proposals), and these people may have been protected from electrocution by the proposed GFCIS-3Ph. See also the Explanation of Negatives of Mr. King and Mr. Weber for this Proposal. The patent applications are pending for the GFCIS-3Ph as of this date, but further field measurements made since the Proposal submittal date indicate that the distributed phase capacitances on an actual installed three-phase 480 volt power system are balanced enough to permit the sensitivity described in the proposals.
Panel Meeting Action: Reject
Panel Statement: The panel disagrees that there is sufficient substantiation for supporting a mandatory requirement for GFCI protection of 277V lighting systems. The submitter’s substantiation pointed to the material submitted with the original proposal. In reviewing the data, it is evident that well over 90% of the instances cited are related to improper work practice and work on energized equipment. In a significant number of those instances, the revision to the NEC for a disconnect on each luminaire [as required by 410.73(G)] will resolve the issue. There are also a number of instances cited that do not necessarily fit the submitter’s claim relative to 277 V lighting. These include ungrounded 480V luminaires and circuits that may not even be lighting related. The panel also expresses concern that the submitter’s approach to the code language is focused on a proprietary system, which may not be the only solution to the problem if one is substantiated.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: KING, D.: The life saving benefits of this new technology warrants further review by panel 2. Although the Panel assessment of the submitter’s data may be that over 90% of the instances were related to improper work practices, the Panel end of the proposed wording: This requirement shall become effective January 1, 2011. This aligns with Mr. Weber’s Explanation of Negative for Proposal 2-88 regarding the development of new, life-saving concepts. Adding the delayed effective date would provide the incentive and the necessary time for the Three-Phase Ground-Fault Circuit-Interrupter System (GFCIS-3Ph) to be further developed and commercialized.
Panel Meeting Action: Reject
Panel Statement: The exception language is specific to allow a particular arrangement under specified conditions of maintenance and supervision. The panel reiterates its statement that the authority having jurisdiction has the responsibility to evaluate whether persons responsible for the supervision and maintenance are qualified before permitting such installations. This is no different from determining whether the applicability of other provisions of the code use similar limitations.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: KING, D.: This Comment should have been accepted. See my explanation of negative on Comment 2-63.
Comment on Affirmative: BROWN, L.; 1: The device installed in dwelling units to announce the presence of smoke and a possible fire situation is called a “smoke alarm”. They can be either the single-station or multi-station type.
2: NEC Code Making Panel 2, nor any Panel of the NEC (NFPA 70), has jurisdiction over the installation of fire notification equipment in any occupancy of a standard developed by NFPA. That is the responsibility of the occupancy Technical Committees of NFPA 101, Life Safety Code. A proposed change of this type should be submitted to the Technical Committee on Residential Occupancies.
2-65 Log #509 NEC-P02
(210.11(B)) Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 2-93
Recommendation: Accept the proposal revised:
Where the load is calculated on a volt/ampere per square meter or square
ft basis, the wiring system up to and including the branch circuit panelboard
overcurrent device(s) shall be provided to serve not less than the calculated
load. The load shall be evenly proportioned among multioutlet branch circuits
in the panelboard as much as practical between the ungrounded feeder and
service conductors where the feeder or service conductors consist of two or
more ungrounded conductors. Branch circuit overcurrent devices and circuits
shall only be required to serve the connected load.

Substantiation: Panel statement that “panelboard” is correct infers that
a single individual fused switch or circuit breaker cannot supply a branch
circuit. Reference to feeder and service conductors is not inappropriate since
the first sentence “The wiring system up to and including the branch circuit
panelboard” certainly includes any feeder or service conductors. “Connected”
load is not defined; the first sentence indicates the system (including
overcurrent devices) shall serve the calculated load; the last sentence only
requires overcurrent devices and circuits for a connected load which infers
a different. This is a superfluous requirement since if there is a connected
or calculated load to be supplied it inherently requires overcurrent devices
and circuits. Requiring the load (sq ft area) to be evenly apportioned among
multioutlet circuits precludes installation of a 20-ampere circuit to serve an
800 sq. ft area (2400 va) and a 15-ampere circuit from serving a 600 sq. ft area
(1500 va) since the calculated load is not evenly proportioned. It also precludes
a circuit supplying two or more outlets in close proximity for a limited area
at a computer desk or entertainment center unless all other circuits supply an
equal area (load). I don’t believe the Code elsewhere requires balanced loads
between branch circuits; what purpose does it serve? Balanced loads on branch
circuits are not relevant. Each circuit may serve a maximum sq. ft area or less
than the maximum sq ft area. Present wording requires each circuit to serve
an equally proportioned load (sq ft area) which requires equal circuit ratings.
Balanced loads of branch circuits are relevant to feeder and service conductors
that consist of more than two conductors but not when the feeder or service is
two conductors.

Panel Meeting Action: Reject
Panel Statement: The submitter is attempting to change the entire intent of
the section. The objective of 210.11(B) is to make sure that the load that is
calculated on a VA/sq ft basis is evenly proportioned among the branch circuits
used to supply that load. The submitter is attempting to change the provision to
a requirement to simply “balance the load” among the phase or line conductors.
The purpose is to balance the load among the multi-outlet branch circuits that
supply the VA/sq ft load.

The term “branch circuit panelboard” was included in the 1981 NEC. In the
context of applying the requirement among multioutlet branch circuits, the
reference to a panelboard is correct.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-66 Log #441 NEC-P02
(210.11(C)) Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 2-101
Recommendation: Accept proposal.
Substantiation: The panel cited several code sections which are exactly the
basis for the proposal. Many hair blow dryers and portable electric heaters have
current (wattage) ratings that exceed 80 percent of a 5 ampere rated
receptacle. The submitter is attempting to change the entire intent of
the section. The objective of 210.11(B) is to make sure that the load that is
calculated on a VA/sq ft basis is evenly proportioned among the branch circuits
used to supply that load. The submitter is attempting to change the provision to
a requirement to simply “balance the load” among the phase or line conductors.
The purpose is to balance the load among the multi-outlet branch circuits that
supply the VA/sq ft load. The current rule states that if there is a connected
load in a room that is more than 800 sq. ft, then the loads shall be
proportioned among the multioutlet branch circuits.

Panel Meeting Action: Reject
Panel Statement: The submitter is attempting to change the entire intent of
the section. The objective of 210.11(B) is to make sure that the load that is
calculated on a VA/sq ft basis is evenly proportioned among the branch circuits
used to supply that load. The submitter is attempting to change the provision to
a requirement to simply “balance the load” among the phase or line conductors.
The purpose is to balance the load among the multi-outlet branch circuits that
supply the VA/sq ft load.

The term “branch circuit panelboard” was included in the 1981 NEC. In the
context of applying the requirement among multioutlet branch circuits, the
reference to a panelboard is correct.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-67 Log #1117 NEC-P02
(210.11(C)(2)) Final Action: Reject

Comment on Proposal No: 2-96
Recommendation: Reconsider and accept the proposal.
Substantiation: More and more we are seeing laundry SPACES, not laundry
ROOMS, these spaces are often just alcoves along a wall and the laundry
appliances occupy the entire space. There is no reason to require a 120V
laundry circuit for this SPACE. If it was a ROOM as indicated on the plans the
receptacle would continue to make sense.

For example, if an electric range is installed there is no NEC requirement that a
120V receptacle be provided in the range space for a FUTURE gas range, so
if the laundry equipment is the 240V type, why must we have a different
rule? Let’s be consistent.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: The panel disagrees with the submitter that the rules are
inconsistent. There is no limitation in the proposal that only a stacked washer/
 dryer would be used. As the occupant of the premises changes, it is common
to move the laundry equipment and as such the requirement for the laundry
circuit is appropriate. The comparison to a range is incorrect since the range is
generally not moved from one location to another.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-68 Log #1687 NEC-P02
(210.11(C)(3)) Final Action: Reject

Submitter: Christopher Couillard, Rochester, NH
Comment on Proposal No: 2-102
Recommendation: Revise as follows:
Such circuits shall supply no more than two bathrooms and shall have no other
outlets.

Substantiation: The comment of affirmative written by Brown, L. states that if
there is a problem with overcurrent devices tripping, then the builders shall
address the situation. Why do we have codes such as 230.79(C)? If this code
was left up to the home builders, they could take the cheap way out and put in
smaller services that would just meet requirements. With the high potential of
overloading the bathroom circuit, it should not be left up to the home builder.

Panel Meeting Action: Reject
Panel Statement: The current language reflects the minimum intended
requirement. The submitter expresses a concern with loading, but even two
bathrooms would result in the same concern if multiple pieces of equipment
were used at once. The current rules provide a balance that accomplishes
the objective of reasonable capacity under the majority of circumstances.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
KING, D.: I disagree with the Panel that “the current rules provide a balance
that accomplishes the objective of reasonable capacity under the majority of
circumstances.” Discussion held during the ROC meeting determined that the
Panel has recognized that there is a problem with circuit loading in dwelling
unit bathrooms. The Panel has acted to address this problem with the addition
of subdivision (3) in the 1999 code to require a 20 ampere circuit for
bathrooms. A better balance as is desired by the panel would be achieved by
accepting this comment.

FPN No. 1: See 820.2 for the definition of point of entrance of CATV coaxial
cable.
FPN No. 2: See 800.2 for the definition of point of entrance of optical fiber
cable.
FPN No. 3: See 820.2 for the definition of point of entrance of CATV coaxial
cable.
Typical household fuses and circuit breakers do not respond to early arcing and sparking conditions in home wiring. By the time a fuse or circuit breaker opens a circuit to defuse these conditions, a fire may already have begun. AFCIs can be installed in any 15 or 20-ampere branch circuit in homes today and are currently available as circuit breakers with built-in AFCI features. In the near future, other types of devices with AFCI protection will be available.

For more information about AFCIs, contact an electrical supply store, an electrician, or the manufacturer of the circuit breakers already installed in your home. Sometimes these components can be replaced with AFCIs in the existing electrical panel box.

Be sure to have a qualified electrician install AFCIs; do not attempt this work yourself. The installation involves working within electrical panel boxes that are usually electrically live, even with the main circuit breakers turned off.

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will not have sufficient experience with the newer combination type AFCI technology. It is more appropriate to leave the current code as written and gain experience with the combination type AFCI’s in bedrooms only. Based on the outcome of this experience further expansion can be considered for the 2011 code.

Purvvis, R., Comment 2-72 on Proposal 2-105 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Comment on Affirmative:
Brown, L., Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-73 Log #1408 NEC-P02 Final Action: Reject
(210.12)

Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 2-105
Recommendation: These proposals to expand the use of an untested (in the field) type of AFCI to all areas of dwelling units should have been rejected. The panel should reconsider the Comments on Negative, especially that by Mr. Nenninger.

Substantiation: Contrary to the statement in Proposal 2-142, the type of AFCI that is being applied here does not “have an excellent track record in the field.” As noted in the comment by Mr. Nenninger, these devices have barely touched the market and are not required at all until 2008. Considering the controversy that has surrounded the current AFCI requirement, extending this requirement to most outlets in dwelling units is not likely to be accepted by a large portion of the jurisdictions that adopt and enforce the NEC. This proposal would add (conservatively) at least $600 to $800 to the cost of a small home, probably much more in many cases. The likely outcome if this proposal continues to be accepted is that large numbers of jurisdictions will not adopt the 2008 NEC or they will amend this provision out. Experience with the combination-type devices is needed before their use is expanded so drastically.

Panel Meeting Action: Reject
Panel Statement: The tests in UL1699 confirm the capabilities of AFCIs for arc mitigation and resistance to unwanted tripping. The panel has been provided with information stating that combination AFCIs have been beta tested and have been made commercially available for field installation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative: Brown, L., Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Nenninger, B.: See my Negative Explanation given in Comment 2-72. Purvis, R., Comment 2-73 on Proposals 2-105 and 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-74 Log #1759 NEC-P02 Final Action: Reject
(210.12)

Submitter: Michael Cole, MRC Electric
Comment on Proposal No: 2-111
Recommendation: Add to Article 590: Branch circuits that are rated 120 volts or 240 volts or 120/240 volts single phase 10 amperes through 30 amperes on construction sites shall be equipped with arc fault circuit interrupter protection.

Add to both Article 590 and 210.12.
Exception No. b: Oil burning heating equipment, spark ignition gas burning equipment, electrostatic air cleaners, welders, plasma cutters, and other equipment that normally or deliberately produces sparks. For dwellings, exempted branch circuits shall use the combination of metal enclosed wiring and ground fault protection for equipment in place of AFCI protection.

Exception No. c: Permanently installed heated, ventilation, and exhaust air conditioning equipment including accessories for heating, ventilation, and air conditioning equipment such as humidifiers and dampers. An indicator light that such equipment is energized shall be included in this exception. For dwellings, exempted branch circuits shall use the combination of metal enclosed wiring and ground fault protection for equipment in place of AFCI protection.

Exception No. d: Sump pumps and other equipment that is vital to protection of property. For dwellings, exempted branch circuits shall use the combination of metal enclosed wiring and ground fault protection for equipment in place of AFCI protection.

Substantiation: a. The next generation of AFCIs are supposed to be more sensitive to arcing faults but I do not see how more sensitive can be compatible with oil burners or electrostatic air cleaners. These types of appliances do not create fire hazards. b. I can agree with extending AFCI protection to include living rooms, dining rooms, and similar areas where cords can be trapped underneath furniture feet or trampled underfoot. At one rooming house where I lived one of the tenants kept knocking out the power because he was parking his bar stool on top of extension cords. He was so heavy that he would crush the hollow metal legs of his bar stool right through the rubber feet and then into the extension cord. This also requires coordination with the manufacturers of bar stools and step stools to the effect that a metal plate needs to be welded to the bottom of hollow metal legs to avoid this kind of problem.

b. Where AFCI protection is already needed is on construction sites as an additional protection against cord cuts, cord pinches, and cord crushing.

d. The cost of additional AFCI protection could bring us back to the days when an upscale suburban house had only 10 120-volt branch circuits. Fewer branch circuits results in heavier loading of each branch circuit resulting in more heat resulting in more net fire hazard. Likewise, people who have older houses could be deterred from having service upgrades and replacements done.

I recently replaced the service cable and meter socket for a single family dwelling where a previous electrician had run aluminum SEU cable from a meter socket with brass terminals to a new service panelboard. Worse, he did not install any oxidant compound on this work. Transient voltage from the panelboard was at 1560 volts.

e. Ban 16 gauge and 14 gauge junior grade e.g., SJTW consumer grade cords. These things are junk and are a fire hazard if someone hooks up an electric heater to them. 16 gauge and 14 gauge extension cords that are oil resistant industrial grade extra hard usage would still be OK. Those people who want the extra expansion thickness and crush resistance of a SOOWA cord need to trade off some of the copper weight when taking these things up ladders and are the kind of people who know what constitutes an overload.

f. Ban the use of 15-ampere wire to supply receptacles in dwellings. This would save on extra heat generation not to mention that a 1500-watt 200 volt electric heater is theoretically illegal on a 15-ampere branch circuit. About half of the jurisdictions (cities) around where I live have banned 15-amp wire.

g. An uninterruptible power supply nullifies AFCI protection. If we are going to connect a secondary power supply such as a UPS to a smoke alarm circuit, why even have the AFCI upstream?

h. 240-volt outlets all over the house might get to be popular. Theoretically, a 240-volt comfort heater that is cord and plug connected can be 240 volts in a dwelling but there is no AFCI requirement. Theoretically, a fixed electric heater in a dwelling can be 277 volts!

i. Connecting a furnace or a sump pump to an AFCI could create a flood. Likewise for antifreeze tapes for water and sewer pipe. There is not a whole lot of evidence that these kind of appliances will present the kind of hazard where an AFCI would provide additional protection. The antifreeze tapes that have a grounded shield and are self regulating have an excellent safety record, particularly when equipment ground fault protection or GFCI protection for people is used. When furnaces go bad they either short circuit, stop working, or release carbon monoxide into the air. When sump pumps go bad they either short circuit or stop working. For both furnaces and sump pumps an AFCI would not provide worthwhile additional protection for the appliance.

j. Has anybody tested AFCIs for compatibility with OLD refrigerators or any other old equipment? Some of these things have a life of 40 years yet can have goofy characteristics. Old refrigerators tend to trip GFCI receptacles because among other things the motor insulation is rather cheap. There are also instances where when the starting switch of a cheap split phase motor opens the circuit inductance forces a phantom ground fault to flow through the insulation capacitance ground which trips a GFCI or AFCI. Since the motor runs fine on a standard circuit breaker the problem cannot be inrush or locked rotor current but rather the transient response during the starting sequence.

Panel Meeting Action: Reject
Panel Statement: Listed AFCI Devices are evaluated for unwanted tripping per UL 1699. The submitter has not provided any substantiation that the equipment noted is incompatible with AFCI’s. The panel also notes that the recommended change to Article 590 is not under the jurisdiction of this panel.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
Brown, L., Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

70-52
The reason why this has not occurred with GFCI circuit breakers is that manufacturers are not trying to be a smart alec, I am just trying to point out a potential gotcha. The reason why this has not occurred with GFCI circuit breakers is that GFCI receptacles are cheaper which limits the use of GFCI circuit breakers to instances where light switches, swimming pool pumps, and so forth need protection. The reason why this problem has not occurred with equipment ground fault protection for roof deicing systems is that the NEC circuit breaker needs to be located close to the start of the roof deicing tapes to reduce nuisance tripping. Also, in large buildings it is more effective and economical to control voltage drop by using oversized feeder wires and smaller panelboards located more frequently than to use oversized branch circuit wires. The present generation of AFCI or GFCI protected lighting circuits are more troublesome. The problem is not with steady state capacitance but with transient response to ballast inductance and wiring capacitance. I am also suspicious that some people play with the test button of a GFCI receptacle or even deliberately plug themselves in just to see if it will stop them from being electrocuted.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided the panel with adequate technical data to support his recommendation. The panelboards are designed to accept a full complement of circuit breakers, including AFCI and GFCI circuit breakers without creating an overheating condition. With regard to the gutter where a burglar alarm or fire alarm is needed, it is more practical for neutral circuit breakers that connect to the neutral bus without a neutral pigtail but rather with an extra jaw on the back of the circuit breaker. Besides AFCI and GFCI circuit breakers such a panelboard would be more practical for neutral switching circuit breakers that supply circuits in areas that have hazardous atmospheres.

Submitter: Michael Cole, MRC Electric
Comment on Proposal No: 2-142
Recommendation: Add the following text:

"Substantiation: a. An indicator as to trip initiation for AFCI, GFCI, and EGFP (Equipment Ground Fault Protection) circuit breakers will aid troubleshooting and prove or disprove that AFCI protection is providing any useful protection. For instance, the equipment ground fault protection that is built into an AFCI is probably what is sensing and disconnecting nail penetrations particularly those nail penetrations that draw only a few amperes.

b. A suggested standardization for a numeric display or the number of blinks of a light emitting diode would be:
   1. for overload trip or optionally overload or short circuit trip,
   2. optionally for short circuit trip,
   3. for ground fault trip that is not a short circuit,
   4. for arc fault trip,
   5. for short circuit level ground fault,
   6. tripped by means of the test button,
   7. circuit breaker needs to be replaced, and 8. and 9. reserved for future use

There is no reason why these electronic devices cannot be made just a little smarter which will help us troubleshoot electrical problems.

c. One problem that some of my buddies have encountered is that when a load is turned off or when the starting switch of a 120 volt single phase motor cuts off the starting winding, a GFCI or AFCI will nuisance trip. What causes this is that circuit inductance forces a phantom ground fault to flow through the insulation capacitance to ground. Since 120 volt single phase split phase motors are built as cheaply as possible, the windings will have more than their fair share of insulation capacitance to ground. If say 0.16 percent of the starting current of a 1/2 horsepower 120 volt split phase motor diverts into the motor frame when the starting switch opens, an AFCI will read that as a ground fault and trip. This is particularly so when motors are old and very little if any compatibility testing has been done using OLD electrical equipment.

d. For GFCI protection, the problem is much worse. In one instance, a fellow electrical contractor had a commercial bathroom light wired to a GFCI receptacle for extra safety and the wiring method was EMT or Type MC cable. Every once in a while when the light was turned off the GFCI receptacle would nuisance trip. Wiring capacitance that is upstream of the GFCI, particularly the neutral wiring capacitance, contributes to this and certain magic circuit lengths are more problematic. The problem is not with steady state capacitance but with transient response to ballast inductance and wiring capacitance.

e. I am also suspicious that some people play with the test button of a GFCI receptacle or even deliberately plug themselves in just to see if it will stop them from being electrocuted.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
In all, the average annual total cost to the public for the mandatory AFCIs in OTFDs and 4,36,640 for multifamily units, for a total of 37,264,900 multifamily dwelling unit. Using these numbers, there will be 33,28,260 branch circuits in each one- and two-family dwelling unit, and 0 in each egress lighting. NFPA 0 addresses emergency egress lighting.

Using current fire loss data, society will be spending $2,03,230.956 per year. Let’s get to the bottom line on this matter - There is absolutely no fire data that can be used to support the expansion of AFCIs to all receptacles, let alone the mandatory installation of AFCIs in bedrooms.

Looking at the latest data from NFPA in the report “The U.S. Home Product Report (Appliances and Equipment Involved in Fires)”, by John R. Hall, Jr., of the Fire Analysis and Research Division of NFPA dated November 2005, the report shows that the annual average number of home fires is 372,900, with direct property damage of $443,000,000. Of this number 32,000 (or 9% = $39,870,000) of these fires are caused by “electrical distribution equipment.” Of that 9%, only 14,500 (or 4% = $17,720,000) of these fires are attributed to “fixed wiring, switches, outlets, and receptacles.” And, there is no data or study to support that of these 14,500 fires the installation of an AFCI device would have prevented the fire.

Using the U.S. Census Bureau data on building permits for 2004 (Table S-3 Final) shows 1,656,413 one- and two-family dwelling units and 413,664 multifamily units for that year. There are typically 20 (twenty) 20-volt, single phase, 15- and 20-ampere branch circuits in each one- and two-family dwelling unit, and 10 in each multifamily dwelling unit. Using these numbers, there will be 33,128,260 AFCIs in OTFDs and 4,136,640 for multifamily units, for a total of 37,264,900 AFCIs.

Using a wholesale cost of $34.00 per breaker, marked-up the industry standard percentage of 66 percent, produces a cost per breaker of $56.44 to the homeowner. In all, the average annual total cost to the public for the mandatory installation of AFCIs will be $2,103,230,956 ($1,267,006,600 wholesale). That is 2 BILLION, 130 MILLION, 230 THOUSAND, and 956 DOLLARS per year to cover losses of only $39,870,000. That means spending 52 times the amount of money that would be lost if the devices were not installed and that is if the devices work 100% of the time. If you use the losses relating only to “fixed wiring, switches, outlets, and receptacles” the ratio of money spent relative to monetary loss ($17,720,000) is 119 times, again, if they work 100% of the time.

In addition to the submitter’s substantiation, there is no data to support the contention of a neither “excellent track record”, nor information that these “installations have found numerous wiring errors” or “they have found wiring damage and equipment damage that could have been a potential source of fire”. That statement alone provides no correlation between the purported problems and the use of AFCIs.

It should also be noted that it appears the method used to certify these devices actually only tests to make sure the device will not cause an electrical shock or fire problem. IT DOES NOT TEST THE DEVICE TO ENSURE IT WILL PREVENT A FIRE CAUSED BY THE MANY SITUATIONS OF ELECTRICAL ARCING THAT COULD CAUSE A FIRE.

In other words, NO ONE CAN PROVE THESE DEVICES WILL HAVE ANY COST-BENEFIT TO SOCIETY.

The panel needs mandatory installation of AFCIs, let alone the expansion of requiring these devices for all 120-volt, single phase, 15- and 20-ampere branch circuits in dwelling units. Until true field test data on the efficacy of AFCIs can be directly related to saving society monetary loss there is no cost-benefit in this provision.

Recommendation: Reject the proposal.

Substantiation: Let’s get to the bottom line on this matter - There is absolutely no fire data that can be used to support the expansion of AFCIs to all receptacles, let alone the mandatory installation of AFCIs in bedrooms.

Using the U.S. Census Bureau data on building permits for 2004 (Table S-3 Final) shows 1,656,413 one- and two-family dwelling units and 413,664 multifamily units for that year. There are typically 20 (twenty) 20-volt, single phase, 15- and 20-ampere branch circuits in each one- and two-family dwelling unit, and 10 in each multifamily dwelling unit. Using these numbers, there will be 33,128,260 AFCIs in OTFDs and 4,136,640 for multifamily units, for a total of 37,264,900 AFCIs.
Using a wholesale cost of $34.00 per breaker, marked-up the industry standard percentage of 66 percent, produces a cost per breaker of $56.44 to the homeowner.

In all, the average annual total cost to the public for the mandatory installation of AFCIs will be $2,103,230,956 ($1,267,006,600 wholesale). That is 2 BILLION, 130 MILLION, 230 THOUSAND AND 956 DOLLARS.

Using current fire loss data, society will be spending $2,103,230,956 per year to cover losses of only $39,870,000. That means spending 52 times the amount of money that would be lost if the devices were not installed and that is if the devices work 100% of the time. If you use the losses relating only to “fixed wiring, switches, outlets, and receptacles” (the part of the wiring that is claimed to be protected by AFCI breakers) the ratio to money spent relative to monetary loss ($17,720,000) is 119 times, again, if they work 100% of the time.

That statement alone provides no correlation between the purported problems and the use of AFCIs.

In addition to the submitter’s substantiation, there is no data to support the contention of a neither “excellent track record”, nor information that these “installations have found numerous wiring errors” or “they have found wiring damage and equipment damage that could have been a potential source of fire”. That statement alone provides no correlation between the purported problems and the use of AFCIs.

It should also be noted that it appears the method used to certify these devices actually only tests to make sure the device will not cause an electrical shock or fire problem. IT DOES NOT TEST THE DEVICE TO ENSURE IT WILL PREVENT A FIRE CAUSED BY THE MANY SITUATIONS OF ELECTRICAL ARCING THAT COULD CAUSE A FIRE.

IN OTHER WORDS, NO ONE CAN PROVE THESE DEVICES WILL HAVE ANY COST-BENEFIT TO SOCIETY.

The Panel needs to reconsider the mandatory installation of AFCIs, let alone the expansion of requiring these devices for all 120-volt, single phase, 15- and 20-ampere branch circuits in dwelling units. Until true field test data on the efficacy of AFCIs can be directly related to saving society monetary loss there is no cost-benefit in this provision.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-79.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

ENNINGER, B.: See my Negative Explanation given in Comment 2-72.

PURVIS, R.: Comment 2-80 on Proposal 2-106 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Submitter: Lawrence Brown, National Association of Home Builders (NAHB) Comment on Proposal No: 2-111

Recommendation: Reject the proposal.

Substantiation: Let’s get to the bottom line on this matter - There is absolutely no data that can be used to support the expansion of AFCIs to all receptacles, let alone the mandatory installation of AFCIs in bedrooms.

Looking at the latest data from NFPA in the report “The U.S. Home Product Report (Appliances and Equipment Involved in Fires)”, by John R. Hall, Jr., of the Fire Analysis and Research Division of NFPA dated November 2005, the report shows the annual average number of home fires is 372,900, with direct property damage of $443,000,000. Of this number 32,000 (or 9% = $39,870,000) of these fires are caused by “electrical distribution equipment.” Of that 9%, only 14,500 (or 4% = $17,720,000) of those fires are attributed to “fixed wiring, switches, outlets, and receptacles.” And, there is no data or study to support that of these 14,500 fires and the installation of an AFCI device would have prevented the fire.

Using the U.S. Census Bureau data on building permits for 2004 (Table S-3 Final) shows 1,656,413 one- and two-family dwelling units and 413,664 multifamily units for that year.

There are typically 20 (twenty) 20-volt, single phase, 15- and 20-ampere branch circuits in each one- and two-family dwelling unit, and 10 in each multifamily dwelling unit. Using these numbers, there will be 33,128,260 AFCIs in OTFDs and 4,136,640 for multifamily units, for a total of 37,264,900 AFCIs.

Using a wholesale cost of $34.00 per breaker, marked-up the industry standard percentage of 66 percent, produces a cost per breaker of $56.44 to the homeowner.

In all, the average annual total cost to the public for the mandatory installation of AFCIs will be $2,103,230,956 ($1,267,006,600 wholesale). That is 2 BILLION, 130 MILLION, 230 THOUSAND AND 956 DOLLARS.

Using current fire loss data, society will be spending $2,103,230,956 per year to cover losses of only $39,870,000. That means spending 52 times the amount of money that would be lost if the devices were not installed and that is if the devices work 100% of the time. If you use the losses relating only to “fixed wiring, switches, outlets, and receptacles” (the part of the wiring that is claimed to be protected by AFCI breakers) the ratio to money spent relative to monetary loss ($17,720,000) is 119 times, again, if they work 100% of the time.

In addition to the submitter’s substantiation, there is no data to support the contention of a neither “excellent track record”, nor information that these “installations have found numerous wiring errors” or “they have found wiring damage and equipment damage that could have been a potential source of fire”. That statement alone provides no correlation between the purported problems and the use of AFCIs.

It should also be noted that it appears the method used to certify these devices actually only tests to make sure the device will not cause an electrical shock or fire problem. IT DOES NOT TEST THE DEVICE TO ENSURE IT WILL PREVENT A FIRE CAUSED BY THE MANY SITUATIONS OF ELECTRICAL ARCING THAT COULD CAUSE A FIRE.

IN OTHER WORDS, NO ONE CAN PROVE THESE DEVICES WILL HAVE ANY COST-BENEFIT TO SOCIETY.
The Panel needs to reconsider the mandatory installation of AFCIs, let alone the expansion of requiring these devices for all 120-volt, single phase, 15- and 20-ampere branch circuits in dwelling units. Until true field test data on the efficacy of AFCIs can be directly related to saving society monetary loss there is no cost-benefit in this provision.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-79.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 1 Negative: 1

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-83 Log #2005 NEC-P02 Final Action: Reject (210.12)

Submitter: Lawrence Brown, National Association of Home Builders (NAHB)

Recommendation: Accept the proposal.

Substantiation: Let’s get to the bottom line on this matter - There is absolutely no fire data that can be used to support the expansion of AFCIs to all receptacles, let alone the mandatory installation of AFCIs in bedrooms.

Looking at the latest data from NFPA in the report “The U.S. Home Product Report (Appliances and Equipment Involved in Fires)”, by John R. Hall, Jr., of the Fire Analysis and Research Division of NFPA dated November 2005, the report shows that the annual average number of home fires is 372,900, with direct property damage of $443,000,000. Of this number 32,000 (or 9% = $39,870,000) of these fires are caused by "fixed wiring, switches, outlets, and receptacles." Of that 9%, only 14,500 (or 4% = $17,720,000) of those fires are attributed to “fixed wiring, switches, outlets, and receptacles.” And, there is no data or study to support that of these 14,500 fires and the installation of an AFCI device would have prevented the fire.

Using the U.S. Census Bureau data on building permits for 2004 (Table S-3) Final shows 1,656,413 one- and two-family dwelling units and 413,664 multifamily units for that year.

There are typically 20 (twenty) 20-volt, single phase, 15- and 20-ampere branch circuits in each one- and two-family dwelling unit, and 10 in each multifamily dwelling unit. Using these numbers, there will be 33,128,260 AFCIs in OTFDs and 4,136,640 for multifamily units, for a total of 37,264,900 AFCIs.

Using a wholesale cost of $34.00 per breaker, marked-up the industry standard percentage of 66 percent, produces a cost per breaker of $56.44 to the homeowner.

In all, the average annual total cost to the public for the mandatory installation of AFCIs will be $2,103,230,956 ($1,267,006,600 wholesale). That is 2 BILLION, 130 MILLION, 230 THOUSAND AND 956 DOLLARS.

Using current fire loss data, society will be spending $2,03,230.956 per year for AFCIs in a more limited fashion. The panel is not accepting the expansion to all 15- and 20-ampere branch circuits.

Comment on Affirmative:

Comment on Proposal No: 2-115

Number Eligible to Vote: 12

Ballot Results: Affirmative: 0 Negative: 2

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-85 Log #2153 NEC-P02 Final Action: Accept in Principle in Part (210.12)

Submitter: Chris Simpson, Sensata Technologies

Comment on Proposal No: 2-105

Recommendation: The Code Making Panel should continue to “Accept in Principle in Part” this revised text. We agree with the code making panel’s decision to reject the deletion of “combination type” devices.

Substantiation: Combination type AFCI technology is available from Sensata Technologies and we are pursuing UL listing for the circuit breaker application before the end of 2006. Sensata has brought this technology to market in the form of a plug cap for the RAC application in 2004. We’re entering field trials with our combination type product for the circuit breaker application in November 2006 and will be making commercial shipments in early 3Q07.

Panel Meeting Action: Accept in Principle in Part

The panel is accepting a portion of the proposal that expands the requirement for AFCIs in a more limited fashion. The panel is not accepting the expansion to all 15- and 20-ampere branch circuits.

Panel Statement: See panel action and statement on Comment 2-95.

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

PURVIS, R.: Comment 2-85 should be rejected. Even this “limited” expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Comment on Affirmative:

KING, D.: See my Affirmative with Comment on Comment 2-95.

2-86 Log #2219 NEC-P02 Final Action: Reject (210.12)

Submitter: Richard W. Becker, Engineered Electrical Systems, Inc.

Comment on Proposal No: 2-113

Recommendation: Delete this section.

Substantiation: The panel statement claims documentation that supports the panel's position; the documentation referenced does not distinguish between “arching” and “joule heating”. As a result, there is no compelling basis for this device.

Panel Meeting Action: Reject

Panel Statement: The panel has concluded that arcing faults contribute significantly to electrical fires. The submitter has not provided adequate substantiation to support his position that arcing is not a substantial cause of electrical fires.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 2 Negative: 10

Explanation of Negative: BECKER, R.: The panel conclusion that arcing faults contribute significantly to electrical fires is not supported by the substantiation that has been submitted to and on file at NFPA.

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
2-87 Log #2333 NEC-P02 Final Action: Accept in Principle in Part
(210.12)
Submitter: Alan Manche, Square D Company
Comment on Proposal No: 2-142
Recommendation: Continue to Accept the Proposal.
Substantiation: We continue to support expanding AFCI protection to all
d 125V, 15 and 20A circuits. The action taken by the panel is clearly understood
and has been expected by the industry. Square D introduced a Listed
Combination AFCI circuit breaker for sale on October 1, 2006, well over a year
in advance of the present NEC requirement for Combination AFCI on January
1, 2008. Our Combination AFCIs have thousands of hours of successful field
experience and many thousands more in laboratory testing of various loads.

The panel should continue to support protection of the entire branch circuit.
We have investigated multiple home fires that originated in a homerulemen.
Compromising AFCI protection on the homerule is as fundamental as forgoing
overload or short circuit protection on that branch circuit.

I would like to share a personal story with regard to AFCI protection for
those that remain skeptical of the benefit. I moved into a new construction
home in February 2004 that had AFCI protection in accordance with NEC
on the bedroom circuits. Shortly after occupancy, the AFCI tripped in my
daughter’s bedroom. After a short investigation, I found a can light where the
wire insulation had been compromised within the can itself. A couple of
weeks later and the AFCI tripped in the master bedroom, once again, the
AFCI found a recessed light where the wire insulation had been compromised
within the can itself. Concerned with the can lights at this point, I reviewed
all 31 recessed lights in my new house and found one more with a similar
wire insulation issue. There are numerous stories similar to this one where
a standard overcurrent device would have permitted a potential fire ignition
source to persist. Beyond a shadow of a doubt, AFCIs are finding issues in the
electrical system that are potential ignition sources.

Panel Meeting Action: Accept in Principle in Part
See panel action and statement on Comment 2-85.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
PURVIS, R.: Comment 2-87 should be rejected. Even this “limited”
expansion should be reevaluated the next code cycle after additional field
experience with the new combination type AFCI is available for review along
with further substantiation of the need to expand AFCI requirements beyond
bedrooms.

2-273 Log #1762 NEC-P02 Final Action: Reject
(210.12 and Article 240 (New))
Submitter: Michael Cole, MRC Electric
Comment on Proposal No: 2-142
Recommendation: Add the following text to 300.4(A):

Wiring shall not be installed in exterior wood frame walls until after
installation of exterior building finish. This requirement shall apply to
nonflexible steel raceways as well as any other wiring methods and shall apply
regardless of wiring spacing from exterior building finish.

Substantiation: One of the sources of nail penetrations is that alleged
carpenters like to use framing nail guns to install sheathing and siding. This
is so that they only have to own and maintain 1 nail gun. Worse, these people
sometimes miss the 2x4s or 2x6s with the result that a conventional antinailing
device does NOT work as advertised.

Also, nail guns can drive a framing nail into steel EMT. Somebody I know
told me that when he was working as an electrician for his dad in Canada
somebody else drove a big nail right through EMT when putting up the
drywall. This incident occurred BEFORE nail guns.

I can actually be glad that one of my customers had to wait a year in order to
be able to afford to have me install nonmetallic sheathed cable in a commercial
wood framed room.

Panel Meeting Action: Reject
Panel Statement: The submitter’s recommendation does not correspond to
the original proposal number. Additionally, it is not the intent of the code to
attempt to control the type of construction.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-88 Log #1764 NEC-P02
(210.12 Exception (New))
Submitter: Michael Cole, MRC Electric
Comment on Proposal No: 2-142
Recommendation: Add an Exception to read as follows:

Exception No. a: Where an automatic fire suppression system e.g., sprinkler
system is installed in all habitable rooms including rooms finishable for future
use and a fire alarm system is installed rooms that are not bedrooms shall be
permitted to not have AFCI protection. If the fire suppression system uses
water there shall be a locking receptacle with pilot light and without AFCI or
GFCI protection for the purpose of supplying a dry pipe air compressor. A fire
extinguishing agent that displaces oxygen shall be used.

Substantiation: a. Arguably, a homeowner will get more antibang for the buck
from a fire suppressor system. CHILDREN playing with matches as well as
careless smokers cause more fires than electrical systems. Simply put,
sprinkler systems will save more lives than expanded AFCI requirements will.

I also know someone who died while smoking and subsequently burned
down her house. That was not the way to save on cremation and burial
expenses! A sprinkler system protects against this kind of hazard and AFCI just
does not provide any protection.

The sprinkler system interests have spent a kajillion dollars on low water
consumption sprinkler heads for residential use on typical residential water
services and water wells. Some of these sprinkler heads shut themselves off
after the fire goes out. There have also been some experiments with sprinkler
system construction using plastic pipe to lower construction costs.

In an effort to just trying to point out that a different set of gadgetry will provide more
protection.

d. The cost of additional AFCI protection could bring us back to the days
when an upscale suburban house had only 10 120-volt branch circuits. Fewer
branch circuits results in heavier loading of each branch circuit resulting in
more heat resulting in more net fire hazard. Likewise, people who have older
houses could be deterred from having service upgrades and replacements done.

I recently replaced the service cable and meter socket for a single family
dwelling where a previous electrician had run aluminum SEU cable from a
meter socket with brass terminals to a new service panelboard. Worse, he did not
use any antioxidant compound on this work. That was a fire hazard! And,
AFCIs would do nothing to stop this kind of electrical hazard.

c. In proposal 2-154 (Log #1721) NEC-P02, Mr. Michael McQuade quotes
the Consumer Product Safety Commission estimate of 890,000 unreported
home electrical fires as being even more concerning. This is a misleading
and self defeating argument in 2 ways. First, this number was derived from
the precision engineering formula G=U-E+SxS. Second, electrical fires go
unreported precisely because a conventional stopped the fire. This statement on
the part of the Consumer Product Safety Commission works against increased
AFCI protection.

d. What is hard to distinguish in this debate is the problem that Federal
Pacific, Wadsworth, and Zinsco (including the Zinsco clones made by
Sylvania) alleged circuit breakers develop arthritis after a few years and
provide essentially ZERO overcurrent protection. Dr. Jesse Aronstein is one of
the people who has investigated this problem and has some documents onhis
Commission that AFCIs will provide greater protection does NOT state how
many fires were caused by conventional circuit breakers that refuse to work
correctly after a few years. That is, AFCI protection seems to be overkill for a
problem that would be correctly solved by installing newer and better thermal
magnetic circuit breakers.

My experience with Federal Pacific circuit breakers is that turning off
the circuit breaker and then turning it back on restores normal operation for a
while. Then, the customer discovers that they have 30 or 35 amperes of load
on a 20 amperes circuit. Even Squared, which is the best in the business,
recommends exercising circuit breakers once per year.

Panel Meeting Action: Reject
Panel Statement: Panel 2 recognizes that all fires that occur in dwelling units
are not the result of electrical arcing and supports the use of fire suppression
systems to extinguish these fires. The benefit of AFCI protection is that arcing
faults are mitigated before surrounding combustible surfaces can be ignited,
thus saving many lives and the costs associated with property damage due to
electrically oriented fires.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
2-89 Log #18 NEC-P02
(210.12(A))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-119
Recommendation: The Technical Correlating Committee understands that the Panel Action on this Proposal modifies the Panel Action on Proposal 2-105. The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal to define the requirement to comply with 2.2.2 of the NEC Style Manual by deleting the term within the definition.
Panel Action: Accept
Reuse the definition to read as follows:
"Arc-Fault Circuit Interrupter (AFCI): A device intended to provide protection from the effects of arc faults by recognizing characteristic unique to arcing and by functioning to de-energize the circuit when an arc fault is detected."
Panel Statement: The panel action satisfies the directive of the Technical Correlating Committee.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: 
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-90 Log #2266 NEC-P02
(210.12(A))

Submitter: Michael Beanland, Vancouver, WA
Comment on Proposal No: 2-142
Recommendation: Revise text to read as follows:
An arc-fault circuit interrupter shall be designed and manufactured to provide protection from the effects of arc faults.
Substantiation: If we mandate the use of AFCI devices, the good intentions of manufacturers are insufficient. AFCI manufacturers must be held to a higher performance standard than good intentions. It is reasonable to require that the AFCI device be designed to achieve its objective and that it be manufactured to achieve its design.
Panel Action: Reject
Panel Statement: The recommended text does not comply with 2.2.2.2 of the NEC Style Manual. Requirements are not permitted in a definition.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Explanation of Negative: 
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-91 Log #912 NEC-P02
(210.12(A) and 210.12(B))

Comment on Proposal No: 2-105
Recommendation: I agree with the Panel’s action in 210.12(A), but strongly disagree with the deletion of the word “bedrooms” in 210.12(B).
The Panel should reject Proposal 2-105.
Substantiation: In support of my comment to reject the expansion of combination AFCIs to all dwelling unit circuits is the fact that as of October 13, 2006 there are no commercially available units. With no real world experience on any circuit, it would not be prudent to jump forward from no circuits to all dwelling unit circuits.
I concur with Mr. Nenninger’s negative vote and comments and concerns that he supplied which state as follows:
“The proposal should be rejected at this time, and the installation of AFCI should be limited to bedrooms only. The use of combination type AFCIs will be a requirement in 2008. However, they will not be commercially available until the summer of 2006. The requirement to expand an AFCI product beyond bedrooms to all dwelling unit locations in 2008 is premature as the market will not have sufficient experience with the newer combination type AFCI technology. It is more important to leave the current code as written and gain experience with the combination type in bedrooms only. Based on the outcome of this experience, further expansion can be considered for the 2011 code”.
Mr. Nenninger’s concerns are only amplified by the fact that the summer of 2006 has come and gone without these products being made commercially available.

2-92 Log #398 NEC-P02
(210.12(B))

Submitter: Greg Fretwell, Blue Light Inspection Services
Comment on Proposal No: 2-142
Recommendation: Reject the proposal entirely.
Substantiation: In addition to the remarks of Mr. Weber, Mr. Purvis, Mr. Brown and Mr. Becker, I also question the thermal implications of adding 20 AFCI breakers to a panel that can be in an un-air-conditioned space which may have ambients in the 35-38c range. The addition of 20 AFCI breakers could easily take the panel out of the 40c range that the breakers are rated for. If nothing else, this could shorten the life of the electronics in the AFCI breakers and it could also cause problems with the trip range of the standard breakers.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any technical data to support his substantiation. The problem outlined in the substantiation is a product design issue and needs to be addressed through the applicable product standards.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative: 
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
PURVIS, R.: Comment 2-91 on Proposal 2-105 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-93 Log #534 NEC-P02
(210.12(B))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 2-128
Recommendation: Accept as revised:
Add: “and dormitory” after “dwelling unit” in the text and heading.
Substantiation: Bedrooms in dormitories in colleges, penal institutions, recreational camps, etc. should merit AFCI protection. If without permanent provisions for cooking they are not dwelling units, per definition.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided substantiation to support the expansion of AFCI devices to dormitories.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: 
KING, D.: The discussion at the ROC meeting concluded that the use of the term dormitories is too broad and would implement a requirement that is impractical in certain applications. The intent of this comment is to provide AFCI Protection in occupancies that are similar to dwelling units. The same hazards from the use of electricity exists in dormitories that exist in dwelling units and in many incidences the hazards are compounded by the number of occupants required to share the same room. The Panel should have accepted this Comment in Principal and revised the submitter’s recommended text to read as follows:
“and in dormitories in colleges, penal institutions, recreational camps, etc.” after “dwelling unit” in the text and heading.
2-94 Log #697 NEC-P02 Final Action: Reject (210.12(B))

Submitter: Steve Camponlo, Leviton Manufacturing Co., Inc.

Comment on Proposal No: 2-134
Recommendation: Panel 2 should have accepted the original proposal. Availability is an issue. How can I substitute a negative (none available)?

Substantiation: As of today (10/4/06) No combination type AFCIs are available at New York Electrical Supply houses in my area. Panel 2 was assured that these devices would be available for wide field and pre testing. They are not. Postponing all expansion and combination types for at least one more cycle (2 yrs) is not an option.

Panel Meeting Action: Reject
Panel Statement: See panel statements on Comments 2-72 and 2-73.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 1 Negative: 1

Examination of Negative: NENNINGER, B.: See my Negative Explanation given in Comment 2-72.

Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-95 Log #757 NEC-P02 Final Action: Accept in Principle (210.12(B))

Submitter: Jack Wells, Pass & Seymour/Legrand

Comment on Proposal No: 2-142
Recommendation: The Panel should accept in principle and revise 210.12(B) as follows:

(B) Dwelling Units. All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit bedrooms, family rooms, living rooms, parlors, libraries, dens, sun rooms, recreation rooms or similar rooms, shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit. Branch/feeder AFCIs shall be permitted to be used to meet the requirements of 210.12(B) until such time as data substantiation that has been submitted to and that is on file at NFPA.

Substantiation: Accepting Proposal 2-142 made two significant changes in the requirements for the installation of AFCIs. 210.12(B) will now require:
- AFCI protection for all branch circuits in dwelling units instead of only bedroom branch circuits
- Combination AFCIs are to be provided instead of branch/feeder AFCIs

Based on the requirements in the UL1699, the standard for AFCIs, and information provided to the panel during previous code cycles, it is apparent that the panel made the appropriate decision to require combination AFCIs as the means of protection for branch circuits. Combination AFCIs provide protection that is superior to branch/feeder AFCIs by detecting both series and parallel arcs. There should be little debate that the superior means of protection should be mandated by the code.

The panel made the correct decision in the 2005 NEC by first requiring the “combination type” AFCI before expanding the requirements. It should not waver from this decision.

However, accepting this proposal could couple the introduction of Combination AFCI technology that has little or no field history with the expansion of AFCI protection to significantly greater number of branch circuits.

The current requirement for AFCI protection of bedroom branch circuits most likely involves 3, 4, or 5 branch circuits in a typical dwelling unit. The acceptance of this proposal may increase the number of circuits requiring AFCI protection to upwards of 30 branch circuits in a dwelling unit. Many of these additional branch circuits will be used with equipment that is not found in bedrooms. This may introduce an additional element of nuisance tripping due to the unknown affect of these products on the operation of the relatively new technology of the Combination AFCI which has not been exposed to these conditions in the field. This is especially true in locations such as kitchens, garages, and outdoors where many different appliances and electric tools are used.

Accepting this proposal seems to be a departure from the code Panel’s previously well justified approach of limiting the expansion of the AFCI requirement until there is sufficient information available for the panel to determine that such an expansion is adequately supported by data. The substantiation for the proposal states that AFCIs have an excellent track record in the field. This may be true for Branch/feeder AFCIs but there is no substantiation provided to indicate that this same track record has been established for Combination AFCIs. It will take time to develop the same data for Combination AFCIs that supported the Panel’s consideration for expansion of the Branch/feeder AFCI requirements.

We believe “combination type” AFCIs can be made that will function satisfactorily on a branch circuit without excessive nuisance tripping. However, we believe it is prudent to be cautious and permit “combination technology” to be introduced gradually.

Accepting the proposal to require Combination AFCIs is an important first step in providing the best arc fault protection that current technology has to offer. However, the Combination AFCI should be given the opportunity to develop a field proven track record before expansion to all branch circuits is accepted. Accepting this comment will allow a significant but limited expansion of AFCIs which will allow such a field track record to be developed for the Combination AFCI.

Panel Meeting Action: Accept in Principle
The panel revised the wording in the recommendation of the comment to read as follows:

“(B) Dwelling Units. All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sun rooms, recreation rooms, closets, hallways, or similar rooms or areas shall be protected by a listed arc-fault circuit interrupter, combination-type, installed to provide protection of the branch circuit.”

Panel Statement: The panel accepts the submitter’s concept of a more limited approach to the expansion of AFCI. The panel has used language that is arranged in a manner that parallels the language in 210.52(A) and has also included hallways and closets to address previous proposals about those areas. The panel did not accept the submitter’s deletion of the words “supplying outlets,” because it would introduce confusion regarding branch circuits that passed through these areas but did not supply any outlets in the area.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 8 Negative: 4

Examination of Negative: BECKER, R.: Expansion of AFCI protection is not supported by the substantiation that has been submitted to and that is on file at NFPA.

BROWN, L.: The Panel’s Action to not require AFCI protection only for the receptacles that typically require GFCI protection is backtracking from the Panel’s Actions and Statements shown in the Report on Proposals (ROP). If they felt the entire house should be protected what relevant fire data changed their minds? Please read NAHB’s Comment 2-79. Calling this a “limited approach to the expansion of AFCI” still results in no cost-benefit for society, it just needlessly increases the costs of housing. No jurisdiction should burden its citizens with this unneeded expense. There was never any fire study or cost-benefit study to support installing these devices only for bedrooms in the 1999 NEC. Since then NO data or study has ever been assembled to support the expansion to the whole house. The fact still remains that home buyers in the U. S. will spend approximately 2 BILLION, 130 MILLION, 230 THOUSAND, and 956 DOLLARS per year to cover losses of only $17,720,000. That is a ratio of 119 times the money spent relative to the monetary loss of $17,720,000.

And that is if the devices work 100 percent of the time. If you break that down by each state, that lack of a cost-benefit becomes apparently clear. All jurisdictions that contemplate adopting the 2008 NEC, especially those jurisdiction that by law must show a cost-benefit in the adoption, are encouraged to look closely at this cost-benefit fact and not adopt the 2008 NEC until all provisions requiring AFCIs is stricken (Section 210.12).

NENNINGER, B.: See my Negative Explanation given in Comment 2-72.

PURVIS, R.: Comment 2-95 should be rejected. Even this “limited” expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Comment on Affirmative:
KING, D.: I commend Panel 2 on their decision to expand the requirement for AFCI protection to a significantly larger portion of dwelling units. Although I still support expansion of this requirement to the entire dwelling unit as originally proposed, I recognize the value and benefit of a larger Panel consensus in advancing this life saving technology both today and in the future. I am confident that future field data will continue to reflect the reliability and life saving benefit of these devices.

2-96 Log #893 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc.

Comment on Proposal No: 2-126
Recommendation: Revise as follows:

(B) Dwelling Unit Bedrooms. All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit bedrooms shall be protected by a listed arc-fault circuit interrupter in accordance with 210.12(B)(1), (B)(2), or (B)(3) combination type installed to provide protection of the branch circuits.
Branch Feeder AFCIs shall be permitted to be used to meet the requirements of 210.12(B) until January 1, 2008.

FPN: For information on types of arc-fault circuit interrupters, see UL 1699-1999, Standard for Arc-Fault Circuit Interrupters.

(2) For outlets installed using noncombustible construction methods and employing metallic raceways or metal-sheathed cab arc-fault protection shall only be required to protect appliances or equipment connected to the outlet.

FPN: For a listing of construction type, see Annex I.

(2) For outlets installed using 210.12(B), arc-fault protection shall be of the combination type provided to protect the entire circuit.

Substantiation: As Mr. Becker stated in his Explanation of Negative, there is no substantiation of combustion risk when wiring is enclosed in metallic raceways or metal-sheath cable. Even though no technical data was provided with the proposal for combination type, it is the panel's experience that the use of metallic raceways, with some limitations, to be used as an equipment grounding conductor providing an “effective ground-fault current path”. If arcing occurs within the metal raceway or metal-jacketed cable, the low impedance path of the raceway or cable will facilitate the opening of the overcurrent device to de-energize the circuit, complying with 110.10 and 250.4(A)(5).

B. 310.15(A)(2) Exception allows the use of the higher of two different ambient temperature-based amperages for a conductor when the higher temperature is a small portion of the circuit length (just as an arc-fault) because of the dissipation of heat through the metallic raceway or conductor. This means the use of metallic-based products (metal raceways or metal-sheathed cables) acts as a heat sink, similar to the cooling effect metal enclosures afford, dissipating any heat connected to an arc-fault until the overcurrent device trips.

If the metallic raceway or metal-sheathed cable is installed in noncombustible walls, there is nothing to burn/cause a fire during the time the arc-fault occurs until the overcurrent device trips under “A” above.

This proposal does focus on the major cause of arc-fires - those caused by supply cords and equipment failure - by requiring arc-fault protection for cords and equipment regardless of the raceway/cable or wall construction. This could be in the form of the presently required combination-type AFCI device (UL AWAH), or the outlet type (UL AWBZ or AWGZC!)

Panel Meeting Action: Accept in Principle in Part

The panel rejects the submitter’s proposed deletion of “combination type AFCI” in item (1) and accepts in principle the use of metal raceways for physical protection to the first outlet device.

Panel Statement: The submitter has not provided any substantiation to support his recommendation to delete the requirement for combination-type devices. Metal raceways are acceptable independent of the type of construction. The remainder of the recommendation is addressed with the panel action on Comment 2-129. See panel action and statement on Comment 2-129.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

PURVIS, R.: Comment 2-97 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Final Action: Reject (210.12(B))

Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc.

Comment on Proposal No: 2-142

Recommendation: Reconsider and reinstate previous wording

Substantiation: Expansion of the arc-fault circuit-interrupter protection to all 125-volt, 15- and 20-ampere outlets in a dwelling should be rejected at this time due to several reasons:

A. As Mr. Nenninger pointed out in his Explanation of Negative on Proposal 2-105, AFCI devices are not available until later this year and no data is available to recognize its practical use. It would be wise to use studies conducted after these new types of devices have been installed to determine expansion of the AFCI technology.

B. As Mr. Becker points out in his Explanation of Negative on Proposal 2-142, there is no data on the field performance of these devices - whether they actually prevented arc-fault initiated fires. Test data in a laboratory and actual performance in the field can be (and actually is) quite different. Expansion of untested technology is not prudent.

C. It would appear the provisions of 300.4 “Protection Against Physical Damage” would sufficiently protect dwelling wiring installations from arc-faults in the wiring from the panelboard to the outlet(s). Add to that 334.15(B) “Protection From Physical Damage” and 334.15(C) “In Unfinished Basements” and it would seem any dwelling installation following these requirements could be arc-fires originating only protected appliances or the appliances themselves. This would then be best protected by either AFCI devices at the receptacle location (UL AWBZ or AWGC), or product standards requiring the installation of AFCI protection within the last 12 inches of the supply cord.

D. The only proven benefit, according to field data, of AFCI devices (Branch/Feeder type) is the ability to detect wiring errors, such as loose connections. This seems a costly requirement to detect violations of 110.12 and 110.10.

F. In the NFPA report, “The U.S. Home Product Report (Appliances and Equipment Involved in Fires)”, there is no breakdown of the number or percentage of fires based on the age of the dwelling. It would be expected that a greater number of these fires were reported during older dwellings - those without the benefit of increased wiring safety afforded by new code requirements in Articles 300 and 334. At the present time, there is no requirement of new wiring requirements on existing dwellings unless a municipal permit is taken out, leaving the most possible source of branch-circuit wiring unprotected against arc-faults.

Panel Meeting Action: Reject

Panel Statement: The submitter’s concept that it must be proven how many fires were “not started” is an attempt to prove a negative. The fact that a fire did not occur is not reported. However, there has been extensive review of data and studies associated with AFCI, and the panel supports their continued use as well as expansion. See the panel statement on Comment 2-72, which addresses the submitter’s concerns about the availability of these devices.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Purvis, R.: Comment 2-97 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Final Action: Reject (210.12(B))


Comment on Proposal No: 2-142

Recommendation: I strongly disagree with the Panel’s acceptance of the modifications proposed by the submitter. I would recommend reinstituting the words “supplying outlets” and “bedrooms”. I do support the deletion of the reference to branch feeder AFCIs.

Reject Proposal 2-142.

Substantiation: Proposal 2-142 should be rejected based on the lack of availability of the combination type devices. In essence, the submitter of Proposal 2-142 has recommended that the panel so called “expand” the use of a technology which has no field history and at the time of writing this comment (October 16, 2006) the product cannot be found for sale in the market. This proposal is not an expansion, but rather a “full blown” introduction of an unproven technology on a very grand scale.

During the last code cycle, the panel made it clear that this was the technology (combination type) they wanted all along and put an effective date to convert over to this technology to gain some field experience.

At the ROP stage, of the present code cycle the panel again reiterated its support for the combination type technology only after their desire to be made commercially available now. The panel was promised this by the Square D presenter at the Hilton Head meetings. However, after persistent visits to this company’s electrical distributors the product has never been able to be purchased. As a last resort, the Square D tech line was contacted on October 11th through October 13th as to where the product could be purchased and we were advised that it would not be available until the first quarter of 2007.

The concern over availability relates to performance. In theory, the concept of a combination type AFCI is one that I wholeheartedly support, since my belief is that the superior wiring methods in new home construction are not what really needs to be protected as much as the exposed extended wiring such as extension cords; appliance cords; etc. that are subject to physical damage. However, in order to provide this well justified protection (combination type) the technology is much more sensitive by the very nature of the level of protection it is providing for branch feeder AFCIs. Even if we expected that we would learn how this unknown technology would perform in real world environments interacting with other products comprising of or utilizing our electrical infrastructure. With no knowledge, I implore the panel members to reconsider expanding the use of this new technology until we have some field experience of this new technology.

If we leave the current code text to require the use of combination type AFCIs only on bedroom circuits, we will gain the experience and correct any pitfalls that may be encountered before we embark on requiring their use on all branch circuits.

If the product had a proven track record, expansion would be justified. Without any record, we ask that the panel move judiciously until we have some experience.

The unfortunate history originally with GFCIs should not be lost as a reminder as to what can happen if we push technology before it is ready.
New construction per today's codes has excellent premises wiring. The nuisance tripping from branch circuits such as igniters, appliances, etc. will cause a home owner much inconvenience and contractor to be forced to go back. Panel Meeting Action: Reject

Panel Meeting Action: Reject
Panel Statement: No specific recommendation has been made. The comment does not comply with Section 4.3.3(c) of the NFPA Regulations Governing Committee Projects.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.

Recommendation:
Submitter: David Shapiro, Accurate & Intriguing Writing & Editing
Comment on Proposal No: 2-142
Recommendation: Revise text to read as follows:
(A) Dwelling Units. All 120 volt single phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit bedrooms shall be protected by a...

Ballot Results: Affirmative: 12
Substantiation:
A minor grammatical fiddle, to restore correspondence of number. If “all” circuits must be protected by “a” GFCI, literally, we’re shifting to the British system of having a single Earth Leakage device protecting the entire panelboard. I believe it is preferable that the Code not require reinterpretation, generally: “I know what it means to say, and that’s what I’m going to enforce; don’t come at me with what it says.” The enforcement of this section, as written, by a literalist would be worse yet.

Recommendation:
Comment on Proposal No: 2-111
Recommendation: I strongly disagree with the panel accepting the deletion of “bedrooms” in 210.12(B) but I am in support of rejecting the deletion of “combination-type” in the same paragraph.

Substantiation:
The submitter of this comment support the panel’s position not to accept branch feeder AFCIs as an acceptable alternative to combination type AFCIs as recommended in the original proposal.

Conversely, the submitter of this comment does not agree with the panel’s position to expand combination type AFCI protection to all dwelling unit circuits.

The panel should accept the existing text of the code (combination type on bedroom circuits) with the reference to branch feeders AFCIs deleted.

Substantiation:
The cited portion of the Code defines a combination type AFCI as a device that is a “combination of a fault circuit interrupter, combination type installed to provide protection of the ultimate loads of a circuit.” The nuisance tripping from branch circuits such as igniters, appliances, etc. will cause a home owner much inconvenience and contractor to be forced to go back.

Panel Meeting Action: Reject

Panel Meeting Action: Reject
Panel Statement: The recommended language does not comply with 3.1.1 of the NEC Style Manual, which states that the word “shall” must be used for mandatory language. In addition, see the panel action and statement on Comment 2-100.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Recommendation:
Comment on Proposal No: 2-105
Recommendation: Revise text to read as follows:
(B) Dwelling Units. All 120 volt single phase, 15- and 20-ampere branch circuits installed in dwelling units shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit.

Substantiation:
The nuisance tripping from branch circuits such as igniters, appliances, etc. will cause a home owner much inconvenience and contractor to be forced to go back.

Panel Meeting Action: Reject

Panel Meeting Action: Reject
Panel Statement: The recommended language does not comply with 3.1.1 of the NEC Style Manual, which states that the word “shall” must be used for mandatory language. In addition, see the panel action and statement on Comment 2-100.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Recommendation:
Submitter: Gilbert L. Thompson, MEIA Codes and Standards
Comment on Proposal No: 2-142
Recommendation: The Panel should reconsider their action and reject this proposal. The wording should remain the same as is now found in Section 210.12(B) of the 2005 NEC. The inspector’s association agrees with the four negative comments by Mr. Becker, Mr. Brown, Mr. Nenninger, and Mr. Purvis that the proposal should be rejected. Note: Not all enforcement jurisdictions have adopted the 2005 NEC or the requirement for combination AFCI protection. This new proposal sets no time table to allow for any other type of protection other than just combination type breakers. And again, it is an industry proposed change.

Substantiation:
Mr. Nenninger’s comments on Proposal 2-105 are right on target, especially since the tripping values have been adjusted by UL for the combination type AFCI. There have been recent reports of some nuisance tripping that result in the removal of this protective device and then replacing it with general use breakers. To allow for more research and development of
other possible methods of protecting circuit conductors, we feel it is more appropriate to leave the current code as written and then gain experience with AFCIs in bedrooms circuits only. Further expansion could then be considered for the 2011 code after other data is supplied and experience gained.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-98.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
PURVIS, R.: Comment 2-104 on Proposal 2-125 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-05 Log #34 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Submitter: Herbert S. Pharo, Cape May, NJ
Comment on Proposal No: 2-126
Recommendation: This Proposal should be Accept in Principle as follows:
210.12 Arc-Fault Circuit-Interrupter Protection (B) Dwelling Unit Bedrooms.
(1) 120-Volt, 15 and 20-Ampere Branch Circuits. All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling units shall be protected by a listed arc-fault circuit interrupter, combination type installed in accordance with one of the following: to provide protection of the branch circuit:
(1) All 120-volt, single phase, 15- and 20-ampere branch circuits shall be protected. All other circuits shall be installed in:
  a. EMT or b. Type AC cable with a steel a outer jacket and a copper equipment grounding conductor.
(2) All 120-volt, single phase, 15- and 20-ampere outlets and branch circuit conductors shall be protected at, and downstream of the first outlet, in accordance with the following:
  a. Branch circuit conductors to the first outlet of all 120-volt, single phase, 15- and 20-ampere circuits are installed in EMT or type AC cable with a steel a outer jacket and a copper equipment grounding conductor. .......... Branch feeder AFCIs shall be permitted to be used to meet the requirements of 210.12(B) until January 1, 2008.

The following discussion is based on the most recent data that I could find. In November of 2005 the CPSC released the “999 Revised – 2002 Residential Fire Loss Estimates.” Table 4a on page 17 outlines the number of fires for different types of electrical equipment in residential structures. Table 1a outlines the total number of fires. This report is included for the members of CMP-2. The entire report is available online at http://www.cpsc.gov/library/fire02.pdf

In order for one to objectively review the 2002 fire data, with respect to the proposed AFCI requirements, we must identify where and at what voltages fires are occurring. Please read the note at the bottom of table 4a. As fire statistics are rounded off to the nearest 100, adding the individual categories for fires will not equal the column total. Adding the individual categories for 2002 comes to a total of 82,400.

2-105 Log #1314 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Comment on Proposal No: 2-125
Recommendation: Reject Proposal 2-125 in its entirety.
Substantiation: Proposal 2-125 should be rejected since the data does not support the expansion of the use of present AFCI technology to the entire dwelling unit. Present AFCIs (available to purchase today) have not been proven to reliably protect against series arcs in extension cords. The combination type AFCIs have not been installed and proven to work in the field at this time. There has been a lot of discussion about protecting building wiring with the circuit breaker type AFCI. EEI supports the concept of protection of wiring in older homes. However, wiring properly installed in new homes in accordance with the requirements of the NEC does not require the additional level of protection for branch circuit wiring by AFCIs.

Panel Meeting Action: Reject
Panel Statement: The tests in UL1699 confirm the capabilities of combination-type AFCIs for series arc mitigation. The panel has been provided with information stating that combination AFCIs have been beta tested and have been made commercially available for field installation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject (210.12(B))
Panel Meeting Action: Accept in Principle

Panel Statement: Based on data submitted over several code cycles, the panel continues to support the belief that AFCIs provide a significantly improved level of protection for the electrical system.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Examination of Negative:

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

KING, D.: Panel 2 should have given further consideration to the submitter’s substantiation regarding fires that occur in fixed wiring circuits rated over 120 volts. The data provided by the submitter from the Consumer Product Safety Commission illustrates an alarming number of electrically oriented fires in circuits rated above 120 volts that are not protected by the requirements of 210.12(B) as presently written. Panel 2 should have addressed these unprotected circuits by accepting in principle this comment with the following revised text:

Revised Subdivision (1)(A) to read as follows: EMT, Rigid Metal Conduit, Intermediate Metal Conduit or...

Revised Subdivision (2)(A) to read as follows:

Branch circuit conductors to the first outlet of all 120-volt, single phase, 15- and 20-ampere circuits are installed in EMT, Rigid Metal Conduit, Intermediate Metal Conduit or type AC with a steel outer jacket and a copper equipment grounding conductor and...

(B) all other circuits shall be installed in EMT, Rigid Metal Conduit, Intermediate Metal Conduit or Type AC cable with a steel outer jacket and a copper equipment grounding conductor.

The revised text includes other types of metal raceway that would provide an equivalent level of protection for the portion of branch circuit wiring that is not protected by an AFCI device.

Although I applaud the advancements in safety made by the Panel action on Comment 2-129, a much greater level of safety would have been achieved through my recommended Panel action on this Comment.

2-106 Log #1325 NEC-P02

Final Action: Reject

(210.12(B))

Submitter: David R. Carpenter, Florence, AL

Comment on Proposal No: 2-142

Recommendation: This proposal and the expansion of requirements for AFCIs in dwelling units should be rejected.

Substantiation: Replacing the term “All 120-volt, single phase, 15- and 20-ampere branch circuit supply outlets installed in dwelling units bedrooms” with the term “All 120-volt, single phase, 15- and 20-ampere branch circuits” is a huge and far reaching change without substantiation. The submitter convinced the panel with knee jerk logic, but has provided no substantiation for this change. Nothing has been presented that proves AFCIs have reduced loss of property or life. The AFCI is not a “Catch All” breaker that can eliminate every fault signature hazard. The present technology is based on certain frequencies of an arc.

As an inspector, I find it very difficult to defend this code requirement to my constituents. I see no justification by the submitter based on history of an unsafe condition nor do I see any technical data to back the claim. Without proper justification, it appears the code is being used as a tool simply to sell products and not to prevent shock and fire hazards as in the stated purpose 90.1.

Panel Meeting Action: Reject

Panel Statement: Based on data submitted over several code cycles, The panel continues to support the belief that AFCIs provide a significantly improved level of protection for the electrical system.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Examination of Negative:

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

NENNINGER, B.: See my Negative Explanation given in Comment 2-72.

PURVIS, R.: Comment 2-106 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-107 Log #1405 NEC-P02

Final Action: Accept in Principle

(210.12(B))

Submitter: J.A. Wafer, Eaton Electrical

Comment on Proposal No: 2-142

Recommendation: Continue to Accept the Proposal as submitted.

Substantiation: This comment is intended to confirm Eaton Electrical’s support for the Panel action. There is no question that the 1999 Code provided a significant improvement in residential electrical safety by requiring AFCI protection for dwelling unit branch circuits, effective January 1, 2002. The Panel’s acceptance of this proposal will further increase this level of safety. As noted in the submitter’s substantiation to Proposal 2-142, “...it is an appropriate time to expand AFCIs to all 15 and 20 ampere branch circuits in the dwelling.” In particular, the increased fire protection by AFCIs should not be limited to the branch circuits supplying outlets in dwelling unit bedrooms.

70-63

Report on Comments A2007 — Copyright, NFPA

NFPA 70

Total Electrical Fires 82,400 100%

Electrical Fires not mitigated by AFCI 1,900 2%

Over 120-volts, not mitigated by AFCI 41,500 50%

Central & fixed heating, water heater, Fixed central AC, range/oven/hood, Clothes dryer

Note: The fire may have been in the branch circuit or in the equipment

Note that the total cooking equipment fires are listed on table 1a at 117,700 and table 4a lists 35,500 electrical cooking equipment fires at

Note that the total heating and cooling fires are listed on table 1a at 55,800 and table 4a lists 13,200 electrical heating and cooling

Installed Wiring 81,100 10%

Note that not all installed wiring will be at

120-volt, single phase, 15- and 20-ampere

And may not be AFCI protected

Load side of Outlet 30,900 38%

This includes all other selected electrical equipment on table 4a

No data exists in this or in any report I have seen to differentiate between fires which were started due to an “arcing fault” or a fire started due to

misapplication or user error. The data does reveal significant problems. One may argue that the cooking, heating and cooling fires are incorrectly listed as electrical. Please note that table 1a lists total fires and 4a lists electrical fires.

Total heating and cooling fires were 55,800 on table 1a and heating and cooling fires electrical in nature were 13,200 on table 4a. Total cooking equipment fires were 117,700 on table 1a and cooking fires electrical in nature were 35,500.

One may also argue that some of the “other” categories may not fall into the

“load side” category. The data as outlined represents the CPSC findings and is extremely interesting.

It is extremely disturbing to see that undeniably 50% of electrical residential fires occur with equipment not protected at 120-volt, single phase, 15- and 20-amps. Did these fire start in the equipment or on the load outlet? Could AFCI protection have prevented these fires? Protection of these branch circuits must be considered by CMP-2. EMT is proposed as it would offer significant protection. Type AC cable with a steel outer jacket is proposed as it would also provide necessary protection. It is also proposed to use a copper equipment grounding conductor as the intended purpose of the steel jacket in this comment is for protection only. Type AC cable is required to be constructed with an outer jacket of at least 25 mils. The jacket of most MC cable is NOT recognized as a fault return path and the jacket is permitted to be significantly thinner.

Regardless of how this data is interpreted there are two issues CMP-2 must focus on, fixed wiring and load side of the outlet.

Fixed wiring

Depending upon which report you are reading, fixed wiring causes between

10% and 35% of electrical fires. This problem can be fixed by providing protection of the wiring method. The wiring method of choice in a dwelling unit is type NM. This wiring method is easily damaged and pierced by screws or nails. We could eliminate a significant number of residential fires if we were to eliminate type NM cable from all dwelling units.

Load side of the outlet

AFCI protection will always be necessary to provide protection from arcing faults on the load side of an outlet. Allowing the protection at the first outlet provides protection for all outlets and fixed wiring downstream of AFCI protection at the first outlet. Requiring EMT or type AC cable with a steel outer jacket to the first outlet will provide adequate protection of the home run.

Note: Supporting Material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle

The panel rejects the addition of subdivision (1).

Panel Statement: The data provided in the proposed subdivision (1) does not clearly indicate that the fires that occurred in circuits over 15- and 20-amp, 120 volt would have been prevented by installing the conductors in metal raceways and cables. The panel notes that the proposed subdivision (1) introduces new material. The remainder of the recommendation is addressed by the panel action on Comment 2-129. See panel action and statement on Comment 2-129.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

KING, D.: Panel 2 should have given further consideration to the submitter’s substantiation regarding fires that occur in fixed wiring circuits rated over 120 volts. The data provided by the submitter from the Consumer Product Safety Commission illustrates an alarming number of electrically oriented fires in circuits rated above 120 volts that are not protected by the requirements of 210.12(B) as presently written. Panel 2 should have addressed these unprotected circuits by accepting in principle this comment with the following revised text:

Revised Subdivision (1)(A) to read as follows: EMT, Rigid Metal Conduit, Intermediate Metal Conduit or...

Revised Subdivision (2)(A) to read as follows:

Branch circuit conductors to the first outlet of all 120-volt, single phase, 15- and 20-ampere circuits are installed in EMT, Rigid Metal Conduit, Intermediate Metal Conduit or type AC with a steel outer jacket and a copper equipment grounding conductor and...

(B) all other circuits shall be installed in EMT, Rigid Metal Conduit, Intermediate Metal Conduit or Type AC cable with a steel outer jacket and a copper equipment grounding conductor.

The revised text includes other types of metal raceway that would provide an equivalent level of protection for the portion of branch circuit wiring that is not protected by an AFCI device.

Although I applaud the advancements in safety made by the Panel action on Comment 2-129, a much greater level of safety would have been achieved through my recommended Panel action on this Comment.
Panel Meeting Action: Accept in Principle in Part
Panel Statement: See panel action and statement on Comment 2-85.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
PURVIS, R.: Comment 2-109 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-108 Log #1480 NEC-P02 Final Action: Reject (210.12(B))

Submitter: James Murphy, Lawrence Berkeley National Laboratory
Comment on Proposal No: 2-142
Recommendation: Reject this proposal.
Substantiation: Expanding the use of AFCIs to all 15 and 20 amp circuits installed in dwelling units is unsubstantiated and entirely too far-reaching a proposal. The fire statistics and other material that have been presented as substantiation for expanding AFCIs deal largely with fires occurring in one and two family dwellings. According to NFPA’s U.S. Fires in Selected Occupancies (March 2006) which lists the leading causes of structure fires, fires caused by electrical distribution or lighting equipment in one and two family homes represent 10 percent of the total while they represent only 5 percent of the total in apartments. As the report states: “The systems that tend to be centrally installed, maintained and supervised in apartment buildings, such as heating and electrical distribution equipment, cause a smaller share of the fires in apartments than they do in dwellings.”

This proposal would apply to any type of dwelling unit, whether a single family home or a condominium in a 60 story hi-rise that would have fire-resistant construction, sprinklers, and more robust wiring methods than those typically used in single family homes. The requirement for AFCIs in these dwelling units is an unnecessary feature and is not justified when more stringent building and electrical safety requirements already are mandated by Codes.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree that multi-family dwelling units should have a different level of protection than single family dwellings. See panel statement on Comment 2-106.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
PURVIS, R.: Comment 2-108 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-109 Log #1781 NEC-P02 Final Action: Reject (210.12(B))

Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 2-142
Recommendation: The text should remain as written in the 2005 NEC until such time as there is data to support the expansion of AFCI technology.
Substantiation: The substantiation provided to the panel is a statement that the CMP has reviewed extensive amounts of data and information pertaining to the benefit of AFCIs for the protection of dwelling unit branch circuits. If the CMP has not provided significant amounts of information and data is this information and data available to the public? Anyone is free to install AFCI protection for any and all circuits they desire without a mandate in the NEC. The NEC is by its own intention not a design manual. As a member of the public and NFPA, I follow literature and have not seen data that indicate the fire rates in dwelling units have been affected by the installation of AFCI devices.

Panel Meeting Action: Reject
Panel Statement: The panel has reviewed adequate substantiation that supports AFCI technology and its ability to mitigate arcing faults that can ignite surrounding combustible material. This information is available at NFPA Headquarters. Additional information attesting to the reliability of these devices is available at NFPA Headquarters and was reviewed by the Panel. Actual fire data that reflect the benefit of these devices will not be available until they are required to be used in broader applications in the field.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
Looking at the latest data from NFPA in the report “The U.S. Home Product Report (Appliances and Equipment Involved in Fires)”, by John R. Hall, Jr., of the Fire Analysis and Research Division of NFPA dated November 2005, the report shows that the annual average number of home fires is 372,900, with direct property damage of $443,000,000. Of this number 32,000 (or 9% = $39,870,000) of these fires are caused by “electrical distribution equipment.” Of that 9%, only 14,500 (or 4% = $17,720,000) of those fires are attributed to “fixed wiring, switches, outlets, and receptacles.” And, there is no data or study to support that of these 14,500 fires and the installation of an AFCI device would have prevented the fire.

Using the U.S. Census Bureau data on building permits for 2004 (Table (S-3) Final) shows 1,656,413 one- and two-family dwelling units and 413,664 multifamily units for that year.

Using current fire loss data, society will be spending $2,03,230.956 per year to cover losses of only $39,870,000. That means spending $2 times the amount of money that would be lost if the devices were not installed and that is if the devices work 100% of the time.

In addition to the submitter’s substantiation, there is no data to support the contention of either “excellent track record”, nor information that these installations have found numerous wiring errors or “they have found wiring damage and equipment damage that could have been a potential source of fire”. That statement alone provides no correlation between the purported problems and the use of AFCIs.

It should also be noted that it appears the method used to certify these devices actually only tests to make sure the device will not cause an electrical shock or fire problem. IT DOES NOT TEST THE DEVICE TO ENSURE IT WILL PREVENT A FIRE CAUSED BY THE MANY SITUATIONS OF ELECTRICAL ARcing THAT COULD CAUSE A FIRE.

IN OTHER WORDS, NO ONE CAN PROVE THESE DEVICES WILL HAVE ANY COST-BENEFIT TO SOCIETY.

The Panel needs to reconsider the mandatory installation of AFCIs, let alone the expansion of requiring these devices for all 120-volt, single phase, 15- and 20-ampere branch circuits in dwelling units. Until true field test data on the efficacy of AFCIs can be directly related to saving society monetary loss there is no cost-benefit in this provision.

Panel Meeting Action: Reject
Panel Statement: See panel statements on Comments 2-79 and 2-97.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 2 Negative: 10
Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
in all, the average annual total cost to the public for the mandatory installation of AFCIs will be $2,103,230,956 ($1,267,006,600 wholesale). That is 2 BILLION, 130 MILLION, 230 THOUSAND AND 956 DOLLARS.

Using current fire loss data, society will be spending $2,103,230,956 per year to cover losses of only $39,870,000. That means spending 52 times the amount of money that would be lost if the devices were not installed and that is if the devices work 100% of the time. If you use the losses relating only to "fixed wiring, switches, outlets, and receptacles" (the part of the wiring that is claimed to be protected by AFCI breakers) the ratio to money spent relative to monetary loss ($17,720,000) is 11 times, again, if they work 100% of the time.

In addition to the submitter’s substantiation, there is no data to support the contention of a neither "excellent track record", nor information that these "installations have found numerous wiring errors" or "they have found wiring damage and equipment damage that could have been a potential source of fire". That statement alone provides no correlation between the purported problems and the use of AFCIs.

It should also be noted that it appears the method used to certify these devices actually only tests to make sure the device will not cause an electrical shock or fire problem. IT DOES NOT TEST THE DEVICE TO ENSURE IT WILL PREVENT A FIRE CAUSED BY THE MANY SITUATIONS OF ELECTRICAL ARCING THAT COULD CAUSE A FIRE.

IN OTHER WORDS, NO ONE CAN PROVE THESE DEVICES WILL HAVE ANY COST-BENEFIT TO SOCIETY.

The Panel needs to reconsider the mandatory installation of AFCIs, let alone the expansion of requiring these devices for all 120-volt, single phase, 15- and 20-ampere branch circuits in dwelling units. Until true field test data on the efficacy of AFCIs can be directly related to saving society monetary loss there is no cost-benefit in this provision.

Panel Meeting Action: Reject
Panel Statement: See panel statements on Comments 2-79 and 2-97.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-97.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
PURVIS, R.: Comment 2-114 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Final Action: Reject
2-115 Log #2136 NEC-P02
(210.12(B))

Submitter: Craig Lauder, Dover, NH
Comment on Proposal No: 2-139
Recommendation: Revise text to read as follows:
(B) Dwelling unit bedrooms All 120-volt, single phase, 15- and 20-ampere branch circuits supplying receptacle outlets installed dwelling in unit bedrooms shall be...

Substantiation: UL 1699 tests have shown that AFCI combination breakers protect against parallel arcs for any circuit, so they should not be limited to just the bedrooms. Requiring AFCI for just "receptacle" outlets would not protect hard wired appliances.

Panel Meeting Action: Accept in Principle
See panel action and statement on Comment 2-95.
Panel Statement: See panel action and statement on Proposal 2-142, which satisfies the submitter’s intent.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72.
PURVIS, R.: Comment 2-115 on Proposal 2-142 should be rejected. Even this “limited” expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.
As an inspector, I find it very difficult to defend this code requirement. The nothing has been presented that proves AFCIs have reduced loss of property life. The AFCI is not a "catch all" breaker that can eliminate every fault signature hazard. The present technology is based on certain frequencies of an arc but not all that could occur. See "Leading Causes of Structure Fires in Homes" on NFPA's website.

As an inspector, I find it very difficult to defend this code requirement. The past justification was based on CPSC findings of high rates of fire in bedrooms, I see no justification by the submitter based on history of an unsafe condition nor do I see any technical data to back the claim. Without proper justification it appears the code is being used as a tool simply to sell products and not to prevent shock and fire hazard as is the stated purpose of the NEC in 90.1.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-106.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

BROWN, L.: Please see NAHB's Ballot Comment on Comments 2-79 and 2-95.

ENNINGER, B.: See my Negative Explanation given in Comment 2-72.

PURVIS, R.: Comment 2-116 on Proposal 2-142 should be accepted. AFCI requirements should not be considered for expansion until the combination type AFCIs have had one code cycle of experience along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-117 Log #2174 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Submitter: Chris Simpson, Sensata Technologies

Comment on Proposal No: 2-132

Recommendation: The Code Making Panel should continue to "Accept in Principle in Part" this revised text. We agree with the code making panel's decision to reject the deletion of "combination type" devices.

Substantiation: Combination type AFCI technology is available from Sensata Technologies and we are pursuing UL listing for the circuit breaker application before the end of 2006. Sensata has brought this technology to market in the form of a plug cap for the RAC application in 2004. We're entering field trials with our combination type product for the circuit breaker application in November 2006 and will be making commercial shipments in early 3Q07.

Panel Meeting Action: Accept in Principle in Part

Panel Statement: See panel action and statement on Comment 2-85.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

BROWN, L.: Please see NAHB's Ballot Comment on Comments 2-79 and 2-95.

PURVIS, R.: Comment 2-117 should be rejected. Even this "limited" expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-118 Log #2175 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Submitter: Chris Simpson, Sensata Technologies

Comment on Proposal No: 2-142

Recommendation: The Code Making Panel should continue to "Accept this revised text.

Substantiation: Combination type AFCI technology is available from Sensata Technologies and we are pursuing UL listing for the circuit breaker application before the end of 2006. Sensata has brought this technology to market in the form of a plug cap for the RAC application in 2004. We're entering field trials with our combination type product for the circuit breaker application in November 2006 and will be making commercial shipments in early 3Q07.

Panel Meeting Action: Accept in Principle in Part

Panel Statement: See panel action and statement on Comment 2-85.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

BROWN, L.: Please see NAHB's Ballot Comment on Comments 2-79 and 2-95.

ENNINGER, B.: See my Negative Explanation given in Comment 2-72.

PURVIS, R.: Comment 2-118 should be rejected. Even this "limited" expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

2-119 Log #2192 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)

Comment on Proposal No: 2-142

Recommendation: Continue to Accept the Proposal as submitted.

Substantiation: As noted in the substantiation, it is time to expand the use of AFCI. This comment is intended to address the comments with the negative votes by Mr. Becker, Mr. Brown, Mr. Nenninger, and Mr. Purvis.

Mr. Becker questions the reliability of AFCIs and whether there is enough data on the effectiveness of AFCI to justify expansion. There are over 20,000,000 AFCI in service and the number grows daily. This is a large base and it appears if manufacturers are not aware of reliability issues and Mr. Becker does not present any data supporting his claim of a reliability issue nor has he provided any information to the manufacturers supporting this claim.

Relative to the effectiveness of AFCI, there are situations where AFCIs are detecting arcing situations and protecting the circuit. The devices are functioning and are effective.

Mr. Becker states that substantiation must provide a demonstrable link between the present installation of AFCIs in bedrooms and a reduction of fires before expansion. The effort to quantify a reduction in fires and the use of AFCI will forever be difficult (as it would be with other products) and code making bodies have been careful over the years to withhold advancements in safety for this type of justification. AFCIs do detect arcing situations that if not detected could develop into dangerous situations where a fire could occur. The branch/feeder devices introduced in the 2002 Code provided a significant improvement in safety and the change to combination devices in 2008 will increase this safety level further. AFCI technology is relatively new and will continue to develop and increase the level of safety.

Mr. Becker raises a question about installing GFCIs on branch circuits protected by AFCIs but it is unknown what the issue or question is. GFCIs can be, and have been, installed on the same circuit since AFCIs were introduced. There is no issue and, indeed, some AFCIs have been designed to include 5ma GFCI protection.

Mr. Brown's negative comments indicate that the issue is purely dollars and cents. He does not see it as a dollars and cents issues, and he does not see any information to the manufacturers supporting this claim.

It should be noted that home builders took similar positions when GFCI and smoke alarm requirements were introduced. The same argument is occurring presently with sprinkler protection for dwellings. If all of these issues were viewed only as a dollars and cents issues, we would not have many of the safety improvements we have today. If one applied this same type of analysis as justification for overcurrent protection of circuits, you would arrive at the conclusion that there is no justification for having any overcurrent protection - fuse or circuit breaker - on every circuit. A circuit breaker trip in a dwelling is relatively rare and the number of trips relative to the number installed is infinitesimally low.

The same type of dollars and cents analysis would likely show that GFCI and smoke detectors were not justified. If homeowner's insurance was evaluated on the same basis that Mr. Brown uses, the numbers would probably indicate that the cost of insurance far exceeded the losses and, therefore, no one should purchase insurance.

Mr. Brown notes that until data is available to indicate that AFCIs are directly related to saving society monetary loss that AFCIs should not be required. That logic would result in codes and standards that would have no safety provisions.

Mr. Nenninger questions the timing of expansion. AFCIs have been required in the 2002 and 2005 Code so there is significant experience with the devices (20,000,000+ installed). It is true that the 2008 Code will require a new type of device with expanded safety, but that does not justify not moving forward with expansion of AFCI.
Mr. Purvis comments that field problems, manufacturer recalls, nuisance trips, and lack of support are reasons to not include AFCI in the NEC.

- Relative to field problems there have been some trips with AFCI and while many of these were due to actual arc faults there have been some trips that can be attributed to improper wiring or a specific issue with a connected load. In the instances where there was a question about utilization equipment, AFCI manufacturers have responded to these and made adjustments to the AFCI, if possible and warranted, and the result has been that there are few actual unwanted trip issues reported today. When GFCIs were first introduced, there were numerous complaints of nuisance trips (any trip is a nuisance and many of these were valid trips due to ground faults) but what if AFCIs were never added to the Code because of perceived nuisance tripping issues?

- Relative to recalls, there was a single AFCI recall from one manufacturer. Although this was tied to the specific performance of a component and not the AFCI design, the manufacturer responded quickly and effectively. It should also be noted that in this instance the push-to-test function of the AFCI did exactly as it was supposed to do and indicated that the device had a problem with the arc detection function. The idea that a product recall means that the concept should be removed from the market is not logical. None of us would have an automobile today under this concept.

- The issue of local adoption is indicated as lack of support and, therefore, somehow important in including this in the Code. Local adoption is many times driven for reasons other than safety - e.g., politics - and should not be an issue in what the NEC does. It is also noteworthy that far more jurisdictions have adopted AFCI than those that have not.

The need for AFCI in new houses is questioned because of improvements in wiring. Wiring practices do continue to improve, but unintended things happen in new installations. Systems also continue to age and they are often modified. A perfect installation where nothing goes wrong with the wiring and the loads would not need a circuit breaker or fuse to protect the circuit, but it is understood that the system needs protection against various modes of faults that can occur. The AFCI is an extension of this safety.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: See panel action and statement on Comment 2-85.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 4 Negative: 0
Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72. Purvis, R.: Comment 2-87 should be rejected. Even this “limited” expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Comment on Affirmative:
PAULEY, J.: The panel statement should reference Comment 2-95 instead of Comment 2-85.

2-121 Log #2225 NEC-P02 Final Action: Accept in Principle in Part (210.12(B))

Submitter: Randy Dollar, Siemens Energy & Automation
Comment on Proposal No: 2-142
Recommendation: Continue to Accept the Proposal as submitted.
Submission: Fire data historically takes years of data analysis to show trends in any direction. As an example, the most recent home structure fire statistics information from the NFPA website (dated April 2006) only uses data collected and analyzed through 2002.

The AFCI, combination type, provides an expanded level of protection over the branch/feeder type. To wait the necessary years for fire data analysis to indicate the benefit of AFCIs in bedroom circuits before expanding to all 120V, 15 and 20 ampere circuits is unnecessarily subjecting unwary homeowners to risks.

An example already exists today against the argument of cost considerations used by Mr. Becker in his explanation. Homeowners pay significantly more than the stated $250 to $500 per dwelling unit” in homeowners insurance each year, not just as a one time purchase as with the AFCI. However, the typical homeowner never files a claim in excess of that amount. The explanation by Mr. Brown is essentially the same as that provided by Mr. Becker, only using the total numbers as opposed to the “per house” numbers. In addition, the numbers used by Mr. Brown only indicate the direct property damage. It does not take any consideration for the cost of human lives, irreplaceable personal items, lost work, time and wages, temporary housing costs, etc.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: See panel action and statement on Comment 2-85.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
NENNINGER, B.: See my Negative Explanation given in Comment 2-72. Purvis, R.: Comment 2-87 should be rejected. Even this “limited” expansion should be reevaluated the next code cycle after additional field experience with the new combination type AFCI is available for review along with further substantiation of the need to expand AFCI requirements beyond bedrooms.

Comment on Affirmative:
KING, D.: See my Affirmative with Comment on Comment 2-95.

2-122 Log #2229 NEC-P02 Final Action: Reject (210.12(B))

Comment on Proposal No: 2-138
Recommendation: Reconsider Proposal 2-138 changing “circuit” to “overcurrent.” The revised new text shall read as follows:
These requirements shall also apply to existing installations whenever the overcurrent protection device is replaced as part of a service capacity upgrade or renovation.

Substantiation: I agree with the negative comments of Messrs. King, LaRocca, and Weber. All available information indicates that AFCIs are compatible with older wiring systems. Furthermore, Technology for Detecting and Monitoring Conditions that Could Cause Electrical Wiring System Fires (Underwriters Laboratories, September 1995) indicates that installing AFCIs in older homes will help mitigate fires, thus saving lives. The Panel’s progressive approach in adopting requirements for AFCIs in the 1999 NEC is commendable but subsequently falls short of making a major impact on reduction of fire losses by rejecting inclusion into existing homes. Regardless of Panel 2s action on Proposal 2-142 and the availability of combination-type AFCIs, there should be no further delay in requiring AFCIs to be installed to supply bedroom circuits when a panelboard is replaced and existing wiring is used.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-141.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
KING, D.: See my explanation of negative vote on Comment 2-241.
LA ROCCA, R.: See my explanation of negative vote on Comment 2-241.

Comment on Affirmative:
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
Final Action: Reject

2-123 Log #2243 NEC-P02

Submitter: Stephen Barrett, Bear Electric

Affirmative: 9 Negative: 3

Final Action: Reject

2-124 Log #2245 NEC-P02

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 2-142

Recommendation: This proposal should be rejected.

Substantiation: There is not an AFCI device on the market that can do what the original proposals, some 13 years ago, said that the AFCI device could do. The manufacturers have not been able to make a product that fulfills the promises made in the original proposals and now they want to require more sales of this uncompleted product so that they can force the consumer to pay the additional research and development costs that are needed to make a workable product. These costs should come from the stockholders, not the consumer. This proposal should be rejected until such time as there is a product that does what they promised it could. At this point in time the available AFCI provides so little protection that it is almost worthless.

Panel Meeting Action: Reject

Panel Statement: The submitter of this comment has not provided any documentation to support his claim that AFCI devices do not function as intended to mitigate arcing faults.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-24 Log #2245 NEC-P02 Final Action: Reject—Copyright, NFPA NFPA 70

Final Action: Reject

2-123 Log #2243 NEC-P02

Submitter: Stephen Barrett, Bear Electric

Affirmative: 9 Negative: 3

Final Action: Reject

2-124 Log #2245 NEC-P02

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 2-142

Recommendation: This proposal should be rejected.

Substantiation: There is not an AFCI device on the market that can do what the original proposals, some 13 years ago, said that the AFCI device could do. The manufacturers have not been able to make a product that fulfills the promises made in the original proposals and now they want to require more sales of this uncompleted product so that they can force the consumer to pay the additional research and development costs that are needed to make a workable product. These costs should come from the stockholders, not the consumer. This proposal should be rejected until such time as there is a product that does what they promised it could. At this point in time the available AFCI provides so little protection that it is almost worthless.

Panel Meeting Action: Reject

Panel Statement: The submitter of this comment has not provided any documentation to support his claim that AFCI devices do not function as intended to mitigate arcing faults.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-24 Log #2245 NEC-P02 Final Action: Reject—Copyright, NFPA NFPA 70

Final Action: Reject

2-123 Log #2243 NEC-P02

Submitter: Stephen Barrett, Bear Electric

Affirmative: 9 Negative: 3

Final Action: Reject

2-124 Log #2245 NEC-P02

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 2-142

Recommendation: This proposal should be rejected.

Substantiation: There is not an AFCI device on the market that can do what the original proposals, some 13 years ago, said that the AFCI device could do. The manufacturers have not been able to make a product that fulfills the promises made in the original proposals and now they want to require more sales of this uncompleted product so that they can force the consumer to pay the additional research and development costs that are needed to make a workable product. These costs should come from the stockholders, not the consumer. This proposal should be rejected until such time as there is a product that does what they promised it could. At this point in time the available AFCI provides so little protection that it is almost worthless.

Panel Meeting Action: Reject

Panel Statement: The submitter of this comment has not provided any documentation to support his claim that AFCI devices do not function as intended to mitigate arcing faults.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-24 Log #2245 NEC-P02 Final Action: Reject—Copyright, NFPA NFPA 70

Final Action: Reject

2-123 Log #2243 NEC-P02

Submitter: Stephen Barrett, Bear Electric

Affirmative: 9 Negative: 3

Final Action: Reject

2-124 Log #2245 NEC-P02

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 2-142

Recommendation: This proposal should be rejected.

Substantiation: There is not an AFCI device on the market that can do what the original proposals, some 13 years ago, said that the AFCI device could do. The manufacturers have not been able to make a product that fulfills the promises made in the original proposals and now they want to require more sales of this uncompleted product so that they can force the consumer to pay the additional research and development costs that are needed to make a workable product. These costs should come from the stockholders, not the consumer. This proposal should be rejected until such time as there is a product that does what they promised it could. At this point in time the available AFCI provides so little protection that it is almost worthless.

Panel Meeting Action: Reject

Panel Statement: The submitter of this comment has not provided any documentation to support his claim that AFCI devices do not function as intended to mitigate arcing faults.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-24 Log #2245 NEC-P02 Final Action: Reject—Copyright, NFPA NFPA 70

Final Action: Reject
overcurrent and GFCI devices provide equivalent protection to AFCI. This rule will require significant added construction expense with no substantial improvement in safety and the possible significant degradation in reliability. Unless manufacturers can be held to substantial performance criteria by NFPA rule, the blanket requirement for AFCI is not justified.

Panel Meeting Action: Reject

Panel Statement: The panel does not agree with the submitter’s assertion that the UL standard only evaluates for “basic operation”. The panel has not presented any substantiation that “overcurrent and GFCI devices provide equivalent protection to AFCI”, given that neither of these devices address low-level arcing conditions in multiple modes.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: BROWN, L.; Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Ballot Results: Number Eligible to Vote: 12

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2-126 Log #972 NEC-P02 (210.12(B), FPN)

Final Action: Accept in Principle

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TCC Action: The Technical Correlating Committee understands that the panel action refers to the new FPN No. 3 rather than FPN No. 2.

Comment on Proposal No: 2-143

Recommendation: Revise as follows:

FPN No. 2: See 760.41(B) for power supply requirements for fire alarm systems.

Panel Statement: The panel has revised the FPN to be consistent with the FPN that was added in 210.8(A)(5).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: BROWN, L.; Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

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2-127 Log #558 NEC-P02 (210.12(B) Exception)

Final Action: Accept in Principle

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Submitter: Steve Campolo, Leviton Manufacturing Company, Inc.

Comment on Proposal No: 2-144

Recommendation: The Technical Correlating Committee action was correct in accepting Proposal 2-144 in Part and correlating it with Proposal 2-147.

The panel should modify the proposal to bring the action closer to being even-handed and promoting new technologies and installation practices without requiring ONLY circuit breaker AFCIs to meet the code rule. Parts (a) and (b) of the exception should, indeed, be removed and the exception modified as follows:

Exception: The location of the arc fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit where the arc-fault circuit interrupter is installed within 1.5 m (6 ft) at the first outlet of the branch circuit where the arc-fault circuit interrupter is installed within 1.5 m (6 ft) at the first outlet of the branch circuit.

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Substantiation: By removing (a) and (b) and modifying the exception, this will allow competitive AFCIs namely receptacle types, to be installed and hand for the location of the AFCI to be different than the panelboard if metal conduit is used.

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The steel conduit industry worked with Georgia Tech a number of years ago to develop software that analyzes the effectiveness of steel raceways as an equipment grounding conductor. An analysis of residential branch circuits shows that the fault current levels available in 15 and 20 ampere branch circuits are not sufficient enough to damage the metal raceway to the point of failure. The AFIC detect an arc and trip. After repeated requests, no data was presented originally, or later, that substantiates AFCI protection on the “home run” portion of the branch circuit. The data was clear in indicating arcs at receptacles and in branch circuit extensions.

Panel Meeting Action: Accept in Principle

Panel Statement: The submitter’s recommendation would remove AFCI protection from a significant portion of the branch circuit. Given that 210.12 is intended to provide protection for the branch circuit, the exception is in conflict with the intent. The submitter’s claim that “the data was clear in indicating arcs at receptacles and in branch circuit extensions” is not supported since a significant percentage of the fires are estimated to be in the distribution system itself and not just in extension and appliance cords. The panel has added language that would permit a relocation of the AFCI where metal conduit or steel “Type AC cable” is installed. See panel action and statement on Comment 2-129.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: BROWN, L.; Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

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2-128 Log #755 NEC-P02 (210.12(B) Exception)

Final Action: Accept in Principle

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Submitter: Jack Wells, Pass & Seymour/Legrand

Comment on Proposal No: 2-147

Recommendation: Continue to accept in principle but revise the text adopted in the panel meeting action to read as follows:

Exception: The location of the arc-fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit where the arc-fault circuit interrupter is installed within 1.5 m (6 ft) at the first outlet of the branch circuit.

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Substantiation: Permitting the arc-fault circuit interrupter to be installed at the first outlet of the branch circuit will allow the introduction of receptacle type AFCIs into the market. The technology for receptacle type Combination AFCIs is well developed, but without a clearly defined application for the receptacle AFCIs in the NEC it is unlikely that any manufacturer of these products will undertake the production of receptacle AFCIs. Accepting this comment will allow the continued development of AFCI technology and provide the consumer an alternate product for providing AFCI protection.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel statement on Comment 2-127.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

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2-129 Log #797 NEC-P02 (210.12(B) Exception)

Final Action: Accept in Principle

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Submitter: Richard E. Loyd, Sun Lakes, AZ

Comment on Proposal No: 2-126

Recommendation: Revise text to read as follows:

Exception: The location of the arc fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit where the arc-fault circuit interrupter is installed within 1.8 m (6 ft) of the branch circuit origin. Use of arc-fault circuit interrupter devices is permitted on the “home run” portion of the branch circuit.

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Exception No. 2: Where RMC, IMC or EMT and metal outlet and junction boxes are installed for the branch circuit wiring, it shall be permitted to provide outlet-type or combination-type AFCI protection for each outlet in the branch circuit.

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Final Action: Accept in Principle in Part

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The panel has revised the FPN to be consistent with the FPN that was added in 210.8(A)(5).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: BROWN, L.; Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.
This approach provides the installer and user with multiple options in providing AFCI protection. Nothing is lost through these provisions and the trade-off between the AFCI and the metal conduit has valid technical merit without sacrificing the expected levels of protection of the branch circuit wiring.

This also gives greater flexibility in a number of hi-rise and large multi-family installations as well as some hotel/motel installations where the individual units are defined as dwelling unit rules via 210.18 but are wired with metal raceways.

Panel Meeting Action: Accept in Principle in Part

The panel rejects adding the proposed Exception No.1, deletes the last sentence in Exception No. 2, deletes “No.(2)“ of Exception No. 2, and adds to the new exception the following wording: “or steel armored cable, Type AC, meeting the requirements of 250.118.” after the word “EMT.”

Also, delete the word “or” before “EMT.”

Panel Statement: The panel accepts the deletion of the 6 ft rule.

The panel rejects adding the proposed Exception No.1 because combination-type AFCIs are required, and Exception No. 2 covers the approach of using steel conduit and cables in a more general manner.

The panel has deleted the last sentence in Exception No. 2 because combination devices protect the branch circuit downstream and, therefore, the sentence is unnecessary. The panel has deleted “No. (2)” from Exception No. 2 and added to the new exception the following wording: “or steel armored cable, Type AC, meeting the requirements of 250.118.” after the word “EMT” based on the substantiation provided with Comment 2-105.

Panel Meeting Action: Accept in Principle

The panel has accepted the requirement of branch circuit conductors in metal raceway through the panel action on Comment 2-105. See BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Comment on Proposal No: 2-147

Recommenadtion: Reject the Proposal.

Substantiation: The panel should reconsider and reject the proposal.

Elimination of this physical protection for the branch circuit should not go forward. The entire approach would be better served by the panel requiring the use of EMT, RMC or IMC for any tradeoff in the location of an AFCI. In fact, the panel could take the approach that a combination AFCI be permitted at the first outlet if metal conduit were the installed wiring system. The panel should not ignore any portion of the branch circuit that doesn’t have metal conduit for the physical protection.

The submitter’s approach in the substantiation that the exception somehow limits technological advances is a statement made in a vacuum of history and reality. The original intended purpose of AFCI protection is for the branch circuit wiring. It appears that he is claiming that the purpose should simply be ignored to allow some unstated or undemonstrated “advancement”. No portion of the branch circuit wiring should be ignored relative to the need for AFCI protection. All of the installed system is equally susceptible to being an ignition source and unless the physical protection of the steel conduit system is provided, none of it should be exempted.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel has accepted the requirement of branch circuit conductors in metal raceway through the panel action on Comment 2-129. See panel action and statement on Comment 2-129.

Final Action: Accept in Principle

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

Exception: AFCI protection shall not be required for that portion of the branch circuit continuously enclosed in metal raceway with metal outlet and junction boxes. Outlet-type or combination-type AFCI protection shall be required for that portion of the branch circuit not enclosed in metal raceway.

Substantiation: The action of CMP 2 to require AFCIs on all dwelling unit branch circuits is too broad and will lead to a move away from a “without amendments” use of the NEC. The term “dwelling unit” includes not only one and two family homes but also condominiums and apartments. Dwelling units in condominiums and apartments - especially in hi-rises - usually have fire resistant construction and more stringent wiring method requirements which override the need for whatever benefit combination type AFCIs may provide. My experience as past Chief Electrical Inspector for the City of Chicago lead me to believe that an exception where metal raceway is used would be appropriate and would provide an option that may make this requirement easier for jurisdictions to accept.

In Chicago for the past 50 plus years 100% of legally constructed dwelling type structures have used metal raceway and metal boxes as the wiring method for the fixed wiring in dwellings. I have attached substantiation in the form of NIFRS Data that compares Chicago vs National residential electrical fires. The data shows that Chicago, which uses metal raceway exclusively for dwelling occupancies, has (4) times fewer residential electrical fires as a percentage of total residential fires, than found nationally. Moreover, there are nearly (3) times fewer fires caused by the distribution, which includes the fixed or installed wiring. The requirement for AFCI protection where NM Cable is used will certainly lead to a reduction in fires. Unlike arc faults in combustible NM cable, arc faults either series or parallel within non-combustible steel raceway are always enclosed short-circuits and ground faults. The short circuits and ground faults are completely isolated from the fuel load and are handled very well by conventional circuit breaker or fuses. The cost of requiring AFCI protection to circuits already protected by non-combustible steel raceway is...
This revised exception would also have the much desired effect of encouraging device manufacturers to develop and reintroduce their outlet-type AFCIs for protecting extensions to the fixed branch circuits. The combination of metal raceway and type AFCIs should be an option for those desiring this increased level of safety and protection.  

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel statement on Comment 2-129.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 11 Negative: 1

**Explanation of Negative:** BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

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**2-133 Log #1742 NEC-P02**

**Final Action:** Accept in Principle  

**(210.12(B) Exception)**

**Submitter:** Timothy Arendt, Shamrock Electric Co.

**Comment on Proposal No:** 2-147

**Recommendation:** Replace the existing exception with the following revised language.

**Exclusion:** AFCI protection shall not be required for that portion of the branch circuit continuously enclosed in metal raceway with metal outlet and junction boxes. Outlet-type or combination-type AFCI protection shall be required for that portion of the branch circuit not enclosed in metal raceway.

**Substantiation:** The action of CMP 2 to require AFCIs on all dwelling unit branch circuits is too broad and will lead to a move away from a “without amendments” use of the NEC. The term “dwelling unit” includes not only one and two family homes but also condominiums and apartments. Dwelling units in condominiums and apartments - especially in hi-rises - usually have fire resistive construction and more stringent wiring method requirements which override the need for whatever benefit combination type AFCIs may provide.

My experience as past Chief Electrical Inspector for the City of Chicago leads me to believe that an exception where metal raceway is used would be appropriate and would provide an option that may make this requirement easier for jurisdictions to accept.

In Chicago for the past 50 plus years 100% of legally constructed dwelling type structures have used metal raceway and metal boxes as the wiring method for the fixed wiring in dwellings. I have attached substantiation in the form of NIFRS Data that compares Chicago vs National residential electrical fires. The data shows that Chicago, which uses metal raceway exclusively for dwelling occupancies, has (4) times fewer residential electrical fires as a percentage of total residential fires, than found nationally. Moreover, there are nearly (3) times fewer fires caused by the distribution, which includes the fixed or installed wiring. The requirement for AFCI protection where NM Cable is used will certainly lead to a reduction in fires. Unlike arc faults in combustible NM cable, arc faults either series or parallel within non-combustible steel raceway become enclosed short-circuits and ground faults. These short circuits and ground faults are completely isolated from the fuel load and are handled very well by conventional circuit breakers or fuses. The cost of requiring AFCI protection to circuits already protected by non-combustible steel raceway is not warranted. In fact, my fear would be that the additional AFCI cost would result in less use of metal raceway, which is a superior wiring method for dwellings. All of the benefits of being able to add circuits or replace damaged or aged conductors would be lost. The benefits of metal raceway in reducing dwelling electrical fires was documented at the October 18-19, 2006 NFPRF Symposium on Aging Electrical Wiring Systems.

This revised exception would also have the much desired effect of encouraging device manufacturers to develop and reintroduce their outlet-type AFCIs for the fixed extending exception to branch circuits. The combination of metal raceway with outlet-type AFCIs should be an option for those desiring this increased level of safety and protection.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel statement on Comment 2-129.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 11 Negative: 1

**Explanation of Negative:** BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

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Exception: AFCI protection shall not be required for that portion of the branch circuit continuously enclosed in metal raceway with metal outlet and junction boxes. Outlet-type or combination-type AFCI protection shall be required for that portion of the branch circuit not enclosed in metal raceway.

**Substantiation:** The action of CMP 2 to require AFCIs on all dwelling unit branch circuits is too broad and will lead to a move away from a “without amendments” use of the NEC. The term “dwelling unit” includes not only one and two family homes but also condominiums and apartments. Dwelling units in condominiums and apartments - especially in hi-rises - usually have fire resistive construction and more stringent wiring method requirements which override the need for whatever benefit combination type AFCIs may provide.

My experience as past Chief Electrical Inspector for the City of Chicago leads me to believe that an exception where metal raceway is used would be appropriate and would provide an option that may make this requirement easier for jurisdictions to accept.

In Chicago for the past 50 plus years 100% of legally constructed dwelling type structures have used metal raceway and metal boxes as the wiring method for the fixed wiring in dwellings. I have attached substantiation in the form of NIFRS Data that compares Chicago vs National residential electrical fires. The data shows that Chicago, which uses metal raceway exclusively for dwelling occupancies, has (4) times fewer residential electrical fires as a percentage of total residential fires, than found nationally. Moreover, there are nearly (3) times fewer fires caused by the distribution, which includes the fixed or installed wiring. The requirement for AFCI protection where NM Cable is used will certainly lead to a reduction in fires. Unlike arc faults in combustible NM cable, arc faults either series or parallel within non-combustible steel raceway become enclosed short-circuits and ground faults. These short circuits and ground faults are completely isolated from the fuel load and are handled very well by conventional circuit breakers or fuses. The cost of requiring AFCI protection to circuits already protected by non-combustible steel raceway is not warranted. In fact, my fear would be that the additional AFCI cost would result in less use of metal raceway, which is a superior wiring method for dwellings. All of the benefits of being able to add circuits or replace damaged or aged conductors would be lost. The benefits of metal raceway in reducing dwelling electrical fires was documented at the October 18-19, 2006 NFPRF Symposium on Aging Electrical Wiring Systems.

This revised exception would also have the much desired effect of encouraging device manufacturers to develop and reintroduce their outlet-type AFCIs for the fixed extending exception to branch circuits. The combination of metal raceway with outlet-type AFCIs should be an option for those desiring this increased level of safety and protection.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel statement on Comment 2-129.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 11 Negative: 1

**Explanation of Negative:** BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

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**2-135 Log #1744 NEC-P02**

**Final Action:** Accept in Principle  

**(210.12(B) Exception)**

**Submitter:** Timothy Arendt, Shamrock Electric Co.

**Comment on Proposal No:** 2-144

**Recommendation:** Replace the existing exception with the following revised language.

**Exclusion:** AFCI protection shall not be required for that portion of the branch circuit continuously enclosed in metal raceway with metal outlet and junction boxes. Outlet-type or combination-type AFCI protection shall be required for that portion of the branch circuit not enclosed in metal raceway.

**Substantiation:** The action of CMP 2 to require AFCIs on all dwelling unit branch circuits is too broad and will lead to a move away from a “without amendments” use of the NEC. The term “dwelling unit” includes not only one and two family homes but also condominiums and apartments. Dwelling units in condominiums and apartments - especially in hi-rises - usually have fire resistive construction and more stringent wiring method requirements which override the need for whatever benefit combination type AFCIs may provide.

My experience as past Chief Electrical Inspector for the City of Chicago leads me to believe that an exception where metal raceway is used would be appropriate and would provide an option that may make this requirement easier for jurisdictions to accept.

In Chicago for the past 50 plus years 100% of legally constructed dwelling type structures have used metal raceway and metal boxes as the wiring method for the fixed wiring in dwellings. I have attached substantiation in the form of NIFRS Data that compares Chicago vs National residential electrical fires. The data shows that Chicago, which uses metal raceway exclusively for dwelling occupancies, has (4) times fewer residential electrical fires as a percentage of total residential fires, than found nationally. Moreover, there are nearly (3) times fewer fires caused by the distribution, which includes the fixed or installed wiring. The requirement for AFCI protection where NM Cable is used will certainly lead to a reduction in fires. Unlike arc faults in combustible NM cable, arc faults either series or parallel within non-combustible steel raceway become enclosed short-circuits and ground faults. These short circuits and ground faults are completely isolated from the fuel load and are handled very well by conventional circuit breakers or fuses. The cost of requiring AFCI protection to circuits already protected by non-combustible steel raceway is not warranted. In fact, my fear would be that the additional AFCI cost would result in less use of metal raceway, which is a superior wiring method for dwellings. All of the benefits of being able to add circuits or replace damaged or aged conductors would be lost. The benefits of metal raceway in reducing dwelling electrical fires was documented at the October 18-19, 2006 NFPRF Symposium on Aging Electrical Wiring Systems.

This revised exception would also have the much desired effect of encouraging device manufacturers to develop and reintroduce their outlet-type AFCIs for the fixed extending exception to branch circuits. The combination of metal raceway with outlet-type AFCIs should be an option for those desiring this increased level of safety and protection.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel statement on Comment 2-129.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 11 Negative: 1

**Explanation of Negative:** BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

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**2-134 Log #1743 NEC-P02**

**Final Action:** Accept in Principle  

**(210.12(B) Exception)**

**Submitter:** Timothy Arendt, Shamrock Electric Co.

**Comment on Proposal No:** 2-126

**Recommendation:** Replace the existing exception with the following revised language.

Exception: AFCI protection shall not be required for that portion of the branch circuit continuously enclosed in metal raceway with metal outlet and junction boxes. Outlet-type or combination-type AFCI protection shall be required for that portion of the branch circuit not enclosed in metal raceway.
ground faults are completely isolated from the fuel load and are handled very well by conventional circuit breakers or fuses. The cost of requiring AFCI protection to circuits already protected by non-combustible steel raceway is not warranted. In fact, my fear would be that the additional AFCI cost would result in less use of metal raceway, which is a superior wiring method for dwellings. All of the benefits of being able to add circuits or replace damaged or aged conductors would be lost. The benefits of metal raceway in reducing dwelling electrical fires was documented at the October 18-19, 2006 NFPRF Symposium on Aging Electrical Wiring Systems. This revised wording would also have the desired effect of encouraging device manufacturers to develop and reintroduce their outlet-type AFCIs for protecting extensions to the fixed branch circuits. The combination of metal raceway with outlet-type AFCIs should be an option for those desiring this increased level of safety across the board.

The panel should accept in principle and do not add the exception at all.

The panel should accept in principle and do not add the exception at all.

This revised exception would also have the much desired effect of the conductors in the raceway. protection as well as a proven ground-fault return path should a fault occur in install the branch circuit in metal raceway provides both the necessary physical provisions to provide some level of additional protection. The provision to provisions necessary to omit the AFCI protection on this circuit alone. It is be supplied through an AFCI or GFCI. This exception would provide the substantiation:

omitted.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel statement on Comment 2-129.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 1 Negative: 1
Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-136 Log #559 NEC-P02 (210.12(B) Exception (b)) Final Action: Accept in Principle
Submitter: Steve Cambolo, Leviton Manufacturing Company, Inc.
Comment on Proposal No: 2-147
Recommendation: No. This proposal should modify the proposal to bring the action closer to being even-handed and promoting new technologies and installation practices without requiring (essentially) ONLY circuit breaker AFCIs to meet the code rule. By adding unnecessary impediments in order to use a receptacle, clearly steers an installer to the circuit breaker. Not only Part (b) but in addition Part (a) of the exception should, indeed, be removed and the exception modified as follows: Exception: The location of the arc fault circuit interrupter shall be permitted to be at other than the origin of the branch circuit, in compliance with (a) and (b). A Listed combination type receptacle AFCI shall be permitted to be installed as the first outlet on the branch circuit and the branch circuit wiring is continuous from the service panel to the AFCI receptacle.

Substantiation: By removing (a) and (b) and modifying the exception, this will allow competitive AFCIs namely receptacle types, to be installed and help level the playing field while giving users a choice and placing the reset convenience closer to the living area as opposed to a service panel typically located in a basement, garage or outdoor location. This will also facilitate easier troubleshooting when the AFCI detects an arc and trips. After repeated requests, no data was presented originally, or later, that substantiates AFCI protection on the “home run” portion of the branch circuit. The data was clear in indicating arcs at receptacles and in branch circuit extensions. By allowing AFCI receptacles as a viable alternative, this will promote investment and development of these products in the same manner as the previous ruling of Code-Making Panel 2 when combination AFCI circuit breakers were mandated on the electrical supply. A similar rule was developed and made available. This comment seeks to extend the panel’s intent with alternative products that the industry is asking for without compromising safety since no data was ever presented on the “home run”.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel statement on Comment 2-127.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 1 Negative: 1
Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-137 Log #840 NEC-P02 (210.12(B) Exception No. 2 (New)) Final Action: Accept in Principle
Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 2-142
Recommendation: Add a new Exception No. 2 to read as follows: Exception No. 2: Where a branch circuit to a fire alarm system installed in accordance with 760.41 and 760.121 is installed in RM, IMC, EMT, or steel armored cable, Type AC, meeting the requirements of 250.118, with metal outlet and junction boxes, AFCI protection shall be permitted to be omitted.

Substantiation: The expansion of AFCI protection to all 15 and 20 ampere branch circuits in a dwelling unit creates a conflict with the provisions of Article 760 which states that fire alarm system branch circuits cannot be supplied through an AFCI or GFCI. This exception would provide the provisions necessary to omit the AFCI protection on this circuit alone. It is important that the panel not simply “empt” the branch circuit without further provision to the level of additional protection. The provision to install the branch circuit in metal raceway provides both the necessary physical protection as well as a proven ground-fault return path should a fault occur in the conductors in the raceway.

This is not a burdensome provision since the fire alarm panels are most often located close to the panelboard or, in the case of a Class 2 supply, they can locate the transformer using short branch circuit and run the Class 2 cabling to the fire alarm panel.

Panel Meeting Action: Accept in Principle
Revised wording in the recommendation to read as follows: “Exception No. 2: Where a branch circuit to a fire alarm system installed in accordance with 760.41(B) and 760.121(B) is installed in RMC, IMC, EMT, or steel armored cable, Type AC, meeting the requirements of 250.118, with metal outlet and junction boxes, AFCI protection shall be permitted to be omitted.”

Panel Statement: The revised wording is consistent with the action taken on Comment 2-129 and clarifies the intent of the panel.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-139 Log #756 NEC-P02 (210.12(C) New) Final Action: Reject
Submitter: Jack Wells, Pass & Seymour/Legrand
Comment on Proposal No: 2-188
Recommendation: The panel should accept in principle and revise 210.12 by adding a new section 210.12(C) as follows: 210.12(C) Existing Installations. When the overcurrent protective device for a 120-V, single phase, 15- and 20-ampere branch circuit is replaced as part of a service capacity upgrade or renovation, the branch circuit shall be protected by a listed arc-fault circuit interrupter, combination type, installed at the origination of the branch circuit or at the first outlet of the branch circuit.

Substantiation: The panel rejected this proposal with the statement: “There is a wide variety of existing wiring configurations and the panel needs additional input to the compatibility of these wiring systems with AFCI protection”. The Panel apparently did not dispute that there is a need for AFCI protection in older homes. The substantiation provided with the proposal points to CPSC data that electrical fires predominately occurred in dwellings over 20 years old with the highest rate of fires in dwellings over 40 years old. In the explanation of negatives, several panel members recognized that there is a clear need for AFCI protection in older homes. The Panel’s primary concern seems to be the compatibility of AFCIs with wiring systems in older homes. This comment recommends allowing the use of a receptacle AFCI at the first outlet as an alternative to providing the AFCI at the origination of the branch circuit. Permitting the use of a receptacle AFCI at the first outlet will provide a high level of arc fault protection in older homes.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 2-141.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative: KING, D.: See my explanation of negative on Comment 2-141. LAROCRA, R.: See my explanation of negative vote on Comment 2-141. WEBER, R.: The panel should have accepted in principle and part, thus allowing the use of a combination AFCI outlet device. The device protection means is allowed providing that a steel raceway or Type AC steel jacketed cable and metal outlet
WEBER, R.: The panel should have accepted in principle, the submitter’s

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and
to incorporate this into the National Electrical Code, if not in this cycle then the
there and many of the adjacent unknowing users are at risk; this requirement
done, we will not have the hard copy report to fall back on. The problem is out
however, they do occur and are normally covered up by the offenders. Until
not brought to the attention of the officials having jurisdiction more often;
in turn are then replaced by the occupant and the over load hazard continues

Comment on Affirmative:  
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-140 Log #1007 NEC-P02 Final Action: Reject (210.12(C))

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Recommendation: Accept Mr. Eddie Phillips’ proposed Part (C) as well, as
modiﬁed herewith:

(C) Other Residential Occupancies. All 125 volt, single phase, 15 and
20-ampere branch circuit wiring installed in a lodging and rooming houses,
dormitories, board and care facilities shall be protected by listed arc-fault
circuit interrupters.

Substantiation: Besides Mr. King’s argument that these occupancies serve as
dwelling units and are subject to the same hazards that arise with the use of
electricity as that of any other dwelling unit, many dormitories are occupied by
immature individuals, too creating a greater risk of ﬁre due to arcing
faults. A similar argument could be made about lodging and rooming houses,
especially SFOs. If the entire facility is not to be protected though—many
dormitories, for example, are of sufﬁciently ﬁreproof construction that it is its
individual occupancy that is primarily at risk—it is hard to make argument
that the entire branch circuit be protected, all the way back to the panel, on
a few feet from it. Protect the receptacles, and to the extent the new AFCIs
will do so, the cords plugged into them, and protect the wiring in the walls
from nails, and you’ve protected the individual occupancy from electrical fire
starving within it, to the extent the technology makes possible.

Panel Meeting Action: Reject

Panel Statement: The submitter has not provided any additional information
to support the expansion of AFCI devices to the locations described in the
proposed new subdivision (C).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

KING, D.: This Comment should have been accepted. I agree with the
submitter’s substantiation. The life saving beneﬁt afforded by this technology
should be expanded to include all occupancy as a function of dwelling units. See my explanation of negative on Comment 2-93.

WEBER, R.: The panel should have accepted in principle, the submitter’s
recommendation and proposed text could have been modiﬁed by including
the change supported in Comment 2-238a by changing the term “dormitories” to “sleeeping rooms in dormitories”. With the proposed text and the enhanced
safety potential provided by an AFCI protection means combination breaker
or combination device type with approved wiring methods, in the occupancies
noted will decrease the ﬁre hazard. Those type of facilities do not normally
have a sufﬁcient amount of outlets provided and most when observed in the
field and in actual use have a number of extension cords and related power
taps being utilized to connect the plethora of appliances, lamps, computers,
scanners, stereos, televisions, small refrigerators and hot plates, corn poppers or
other portable cooking means in use. The only way for a building manager to
impact their use is to cut the ends off of the cords or remove the items; which
in turn may then replace by the occupant and the over load hazard continues once
again. Given the small area in each of these type occupancies and the electrical
load imposed on the system, it amazes me that ﬁre incidences are not brought to the attention of the ofﬁcials having jurisdiction more often;
however, they do occur and are normally covered up by the offenders. Until
such time when there is a catastrophe event and a large amount of damage
done, we will not have the hard copy report to fall back on. The problem is out
there and many of the adjacent unknowing users are at risk; this requirement
can augment the level of safety for all. Supporters need to continue the process
to succeed in this idea. The National Electrical Code. If not in this cycle then
the next. We seem to provide a great deal of support for fire suppression systems, “spirkers” and yet are unwilling to limit the ﬁre source from happening in the

first place as in this case, with the increased use of AFCI protection means.

Comment on Affirmative:  
BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-141 Log #1095 NEC-P02 Final Action: Reject (210.12(C))

Submitter: Jim Pauley, Square D Company

Recommendation: The text should be arranged by adding a new (C) to 210.12 as follows:

(C) Panelboard Replacement in Existing Installations. Where an existing
dwelling unit panelboard containing 15 or 20 amperc 120V branch circuit
overcurrent devices is upgraded or replaced, AFCIs shall be installed to meet the
requirements of 210.12(B). Only those branch circuits that are part of the
upgraded or replaced panelboard are required to comply with this section.

Substantiation: The safety beneﬁt for Proposals 2-138 is the compatibility of AFCI devices with the wide variety of wiring systems that are in the installed base of dwelling units. The purpose of this comment is to provide input to that request and to give the panel some suggested language should a retrofit requirement be pursued.

There are numerous wiring systems installed in the existing base. Some of those variations include knob and tube wiring, 2-wire NM cable without
equipment grounding conductors, AC cable and various other wiring methods
still in use today. AFCIs will certainly perform their arc detection function in
all of these wiring systems. But, the panel must recognize that because of the
likelihood of variations to the branch circuit wiring, the AFCI in a panelboard
will likely detect conditions (such as crossed neutrals, grounded neutrals, etc.) that must be corrected and in some cases may require extensive investigation by the
installer and some replacement of wiring. However, it should also be
recognized that these are conditions that should be corrected.

Pursing a retrofit requirement should be approached with the following key points in mind:

1) The protection must be, just as it is for new construction, for the entire
branch circuit. There is no logic to trying to ignore portions of the branch
circuit simply because the branch circuit may contain wiring errors (crossed/
grounded neutrals, etc.).

2) It’s noted that the grounded/crossed neutral situations, if they exist in the
installation, occur throughout the branch circuit – including (and actually most
prevalent in) the wiring downstream of the ﬁrst outlet. Because of this, it makes
to attempt to resolve the issue by relocating the AFCI. In addition, a relocation gives up the protection for the very wiring
where it was intended – the branch circuit wiring.

3) There will be wiring systems that have so many issues that they simply need
to be replaced. This could lead to decisions to not make the upgrades because of
the rewiring needed.

Relative to the code language suggested in this comment:

1) The language in Proposal 2-138 is problematic because it only applies if you
are “replacing” the overcurrent device. In many cases, panels are upgraded
from one amperage to a higher amperage (i.e. 100A panel to 200A panel) and,
if of the same manufacturer and type, the existing circuit breakers are reused. It
would seem that this deﬁes the intended purpose of requiring a retrofit of
AFCIs.

2) This comment proposes to break the retrofit requirement into a new section
(C) that would be explicit to changing out the panelboard.

3) The language is revised to make the retrofit requirement apply when the
panelboard is changed or replaced.

4) The language retains the approach that AFCIs have to be installed for the
same branch circuits that are part of the upgrade or replaced panelboard are required to comply with this section.

Panel Meeting Action: Re却

Panel Statement: The panel would like more experience to be obtained
regarding the installation of combination type AFCIs in new dwellings before
requiring the installation of combination type AFCIs in the wide variety of
existing dwellings that will have numerous different wiring conﬁgurations.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

KING, D.: This Comment should have been accepted. Panel 2 has reviewed
historical Technical data from the Consumer Product Safety Commission that shows that there is an increased number of electrically oriented fires in
existing old with the same type of electrically oriented fires occurring in dwelling units that are over 40 years old. Any
tripping that may occur from the installation of AFCI devices in older wiring
systems is an indication of problems in the electrical wiring that needs to be
All 25-volt single phase receptacles shall have Overload Fault Protection for Personnel.

LAROCCA, R.: Older dwellings are the ones most likely to have wiring configurations that are a wide variety of existing wiring configurations, all should be compatible with AFCIs if they are not damaged or otherwise compromised. Adding AFCIs to these systems will help identify potential dangers in the existing wiring.

WEBER, R.: See reason for negative vote on Comment 2-139. In addition, the submitter’s recommendation should have been accepted and thus fill a void in the code addressing electrical system replacements. The last sentence in the proposed text clearly states where compliance with the requirements of 210.12(B) would be mandatory; a small first step, but one that can only lead to a safer environment for more of the public, that choose to modify their electrical system. As we view the older housing stock in use and the lack of adequate inspection and maintenance given to the electrical system, if anything is to be done; it will be when something burns out or does not work, then and only then will most of the public have the least amount of cost of repairs or replacement work completed to meet the minimum code requirement. We need to be proactive and support this guidance for the user to make the change to the electrical system by clearly stated code language and what must be done on a minimum level. The electrical system may not have any additional work done for a long time; so at the upgrade point, clear code requirements must be provided to the user.

Comment on Affirmative:

BROWN, L.: Please see NAHB’s Ballot Comment on Comments 2-79 and 2-95.

2-142 Log #495 NEC-P02 Final Action: Reject (210.13)

Submitter: David Tweedie, Onancock, VA

Comment on Proposal No: 2-154

Recommendation: Revise text to read as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: I have recently seen a demonstration of the 2D2C, 1AC line-to-line shock protection device. Electrical fires are a huge threat to seniors in homes and nursing facilities. Please check this new device out.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-177.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-143 Log #496 NEC-P02 Final Action: Reject (210.13)

Submitter: Bill Pugh, Naperville, IL

Comment on Proposal No: 2-154

Recommendation: Revise as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: Each year residential fires destroy thousands of homes and kill hundreds of people in the United States. Many of these fires are caused by electrical faults, shorts, overloads, and damaged appliance wiring. An electrical outlet that detects such problems and automatically turns off the electricity would prevent a significant number of these fires saving both lives and property. I recently saw a demonstration of such a device and the performance was impressive. Equally impressive were the statistics on property destruction and deaths caused by electrical fires that such a device would prevent.

First there were fuses, then circuit breakers, then GFI’s; fault sensing and interrupting outlets re the next logical step in the continued improvement of electrical safety. I live outside Chicago and we have a string of firecode and electrical wiring requirements; I wish that devices such as this were part of that code.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-177.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-144 Log #560 NEC-P02 Final Action: Reject (210.13)

Submitter: Bernie Clum, M.D., Watsonville Emergency Medical Group

Comment on Proposal No: 2-154

Recommendation: Revise text to read as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: As an emergency physician for 20 years, I see first hand the ravages of electrical shocks and electrically induced fires on a daily basis. There are almost a million electrical fires each year in the US and nearly one death daily from electrical shock. We obviously need to better protect our citizens. The current use of GFIs is clearly inadequate and outdated technology. I wholeheartedly support the universal adoption of the technology known as Overload Fault Circuit Interrupter Protection. In independent lab testing, it has proven to be worthy of universal adoption. Without doubt, countless lives and dollars will be saved with this revolutionary technology.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-177.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-145 Log #584 NEC-P02 Final Action: Reject (210.13)

Submitter: Daniel Boeckman, Boeckman Investments

Comment on Proposal No: 2-154

Recommendation: Revise text to read as follows:

All 125-volt single phase receptacles shall have overload fault circuit interrupter protection for personnel.

Substantiation: Having had several accidents with electricity as a child and now having three small children of my own, I am exceedingly concerned that we do not yet have any overload fault protection in the National Electrical Code. It seems to me that almost every other form of child safety has been taken care of in the last 15 years from child protective caps on medicine to specially-designed cabinets that can only be opened by adults. I do not know the number of deaths that occur per year in the United States from electrical outlet failure, but if there is even one, that would be too high.

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-177.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-146 Log #585 NEC-P02 Final Action: Reject (210.13)

Submitter: K. Stephan Joseph, Marietta, GA

Comment on Proposal No: 2-154

Recommendation: Revise as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: The overload fault technology is important and would be tremendously helpful in helping to protect people from the potential hazards present in electrical wiring and outlets. This technology would be particularly helpful in keeping both toddlers and senior citizens safe from today’s electrical hazards.

First, let’s address the issues involving toddler safety. Although we were all admonished not to insert any objects into electrical outlets, at some point in time most of us did. Why? We did it because of our natural human curiosity. Children are consistently developing quicker and becoming far more intelligent than the preceding generation. Simple objects like plastic outlet covers are no longer working as effective deterrents for today’s innovative and tenacious youth.

Senior citizens on the other hand may have learned the dangers of electrical shock, they sometimes forget some of the things that they have learned or have reverted to a childlike mental state. In other cases, some seniors have not kept up with current technological advancements.

Although toddlers and senior citizens are the groups who would benefit most from this technology, individuals from all ages in between can benefit as well. It’s no secret that many of us have taken risks when it comes to plugging too many items into a single outlet or plugging in items with damaged electric cords. Some of us are too lazy, too cheap or just too careless to go the extra mile to do things safely. That leads to taking chances and hoping that the outlet can take one more plug or that the vacuum plug can be run over a few more times before having to be tossed out.

With that being said, I truly feel that the world really does need this new technology. Whether it’s for the toddler and senior citizens who don’t know any better or the individuals who are careless and need to be protected from themselves, we are all in dire need of this sort of technology in our homes and businesses. Making this technology code would save countless lives and billions of dollars for insurance companies as well as business and homeowners.
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

We consumers now use significantly more electrically powered devices within our home environments. Many US homes have antiquated electrical outlet than the product was designed to safely handle, but not enough current to exceed the safety threshold of the 15 amperes limit offered by the branch circuit breaker located inside of the home’s electrical distribution panel.

When excess electrical current within the appliance exceeds the product’s design limit, severe heat is produced which in turn may cause ignition of nearby flammable materials close to the failing appliance. If such failure happens in the home, either with or without the occupant’s knowledge, the resulting fire may lead to loss, pain, suffering and even death.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-149 Log #598 NEC-P02 Final Action: Reject

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-147 Log #588 NEC-P02 Final Action: Reject

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-150 Log #606 NEC-P02 Final Action: Reject

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-151 Log #623 NEC-P02 Final Action: Reject

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Some of these consumer appliances contain the convenience feature of internal timers that allow the unattended appliances to turn on by themselves, at pre-scheduled intervals, to prepare the tasks for which they were designed. (TV/VCR, coffee maker, cooker pot, etc.) In some cases, such as with the fax machine and the internet server, the ac power switch of the product remains on and active at all times for the intended operational use of the product.

When I leave and when I return home, it is not practical or convenient to plug and unplug each and every electronic product’s ac cord. Nor is it always practical to do so just at each time many of the electrical products are to be used. I simply don’t bend over as easily as I use to. Crawling around and behind the TV and stereo is not an easy task, nor is it particularly stately safe to be plugging in and unplugging cords and in out of live, as wall outlets in cramped and visually impaired situations. As a consequence, many electronic appliances simply remain continuously connected to the live current of the wall outlets, or into extension cords or other temporary consumer constructed ac distribution systems external to walls of the building.

The U.S. citizen and consumer is only being minimally protected by the individual 15-ampere branch service circuit breaker located at the main electrical distribution panel where electricity service enters the home.

Electrical appliances do occasionally develop faults and fail. When they do fail, they often will so in a manner that draws more AC current from the outlet than the product was designed to safely handle, but not enough current to exceed the safety threshold of the 15 amperes limit offered by the branch circuit breaker located inside of the home’s electrical distribution panel.

When excess electrical current within the appliance exceeds the product’s design limit, severe heat is produced which in turn may cause ignition of nearby flammable materials close to the failing appliance. If such failure happens in the home, either with or without the occupant’s knowledge, the resulting fire may lead to loss, pain, suffering and even death.

Note: Supporting material is available for review at NFPA Headquarters.

Submitter: Marshall Hussey, Dallas, TX
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: I recently had the opportunity to see a product manufactured by a company called 2D2C Inc. I believe they are calling the product the Safe Plug, which utilizes new technologies that they refer to as OFCI, SFCI and PFCI. As far as I can tell, this technology appears to solve a problem in the United States that for some unknown reason has not been addressed up until this point. When you look at the statistics and realize that there are 960,000 home fires that originate with electrical issues, and there is a technology that could arguably prevent all of these fires, I believe that this technology should be mandated. Unfortunately, when people or companies build or renovate structures, they are always looking to cut costs. In fact, the person building the structure or making the decision probably will never spend time in the structure so they are NOT motivated to make it as safe as possible. For this reason, I believe that this product needs to be mandated in the National Electrical Code in order to save lives in the United States. We spend a lot of money in the United States on technology and products that make our lives easier and more pleasant, please consider this product for a much better reason, it will SAVE LIVES!

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: Stephen Jarvis, Glenbrook, NV
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: Local municipalities are spending millions of dollars of our city resources and risking the lives of the brave fire and police personnel every year responding to electrically caused fire and electrical shock incidents that are unnecessary and now preventable. NEC code requirement language should specify the use of ac receptacles that include the features of an available electronically controlled smart technology that causes the outlet to operate as a multi-level circuit breaker and that may only be energized to provide electricity to an appliance by the recognition of a proper ac plug insertion. The proposed change in code language will cause the infusion of the electrical overload circuit technology into the electrical systems of US consumer’s homes which will in turn result in millions of dollars of property being saved and countless vulnerable children and citizen lives being spared from unnecessary loss, pain, suffering and death due to preventable instances and causes of fire and shock hazards.

We consumers now use significantly more electrically powered devices within our home environments. Many US homes have antiquated electrical systems that were not designed for such use. (Consumer Reports.org FEATURED REPORT August 2001 entitled Your Home Wiring: Is it safe?) The fifteen year old building in which I live part-time with an active home office, contains an abundance of consumer electronic appliances, computer work stations, fax machines and entertainment electronic systems in addition to many electrical kitchen appliances, each requiring an activated ac cord in order to be on-line and operational.

In many rooms of the home, the requirement for additional receptacles, for the many ac cords needed for the appliances, exceeds the number of those currently available receptacles within the existing wall outlets. The ease of connection for me, as for most consumers, has been to use multiple outlet extension cords and various external ac distribution systems with multiple outlets.

Some of these consumer appliances contain the convenience feature of internal timers that allow the unattended appliances to turn on by themselves, at pre-scheduled intervals, to prepare the tasks for which they were designed. (TV/VCR, coffee maker, cooker pot, etc.) In some cases, such as with the fax machine and the internet server, the ac power switch of the product remains on and active at all times for the intended operational use of the product.

When I leave and when I return home, it is not practical or convenient to plug and unplug each and every electronic product’s ac cord. Nor is it always practical to do so just at each time many of the electrical products are to be used. I simply don’t bend over as easily as I use to. Crawling around and behind the TV and stereo is not an easy task, nor is it particularly stately safe to be plugging in and unplugging cords and in out of live, as wall outlets in cramped and visually impaired situations. As a consequence, many electronic appliances simply remain continuously connected to the live current of the wall outlets, or into extension cords or other temporary consumer constructed ac distribution systems external to walls of the building.

The U.S. citizen and consumer is only being minimally protected by the individual 15-ampere branch service circuit breaker located at the main electrical distribution panel where electricity service enters the home.

Electrical appliances do occasionally develop faults and fail. When they do fail, they often will so in a manner that draws more AC current from the outlet than the product was designed to safely handle, but not enough current to exceed the safety threshold of the 15 amperes limit offered by the branch circuit breaker located inside of the home’s electrical distribution panel.

When excess electrical current within the appliance exceeds the product’s design limit, severe heat is produced which in turn may cause ignition of nearby flammable materials close to the failing appliance. If such failure happens in the home, either with or without the occupant’s knowledge, the resulting fire may lead to loss, pain, suffering and even death.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: John La Grou, Millenia Media, Inc.
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: I am the founder and CEO of a leading electronics company in the audio market. I maintain professional affiliations as an electrical engineer with IEEE and AES. I’ve worked with AC power and related safety issues for over 30 years and am intimately familiar with safety standards such as UL 813. When the concept of Overload Fault Circuit Interruption was demonstrated to me, I immediately saw enormous value for enhanced safety and security of life, health and property. Based on further statistical research into the causes and effects of electrical hazards (NFPA, USFA, etc.) I am absolutely convinced that OFCI technology will save lives, prevent injury, and reduce property damage - perhaps significantly on all counts. I recommend that OFCI be installed into all habitations.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: Christopher Chambers, Rocklin, CA
Comment on Proposal No: 2-154
Recommendation: Revise to read as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: With the use of the technology used in the Overload Fault Circuit Interrupter, electrical current would be cut off from overloaded AND faulty wiring.

From the NFPA report on Appliance Safety (http://www.usfa.dhs.gov/safety/campaigns/medianitor/ffwfd-4.shtm)

- Eighty-two percent of all fire deaths occur in the home.
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electrical appliances, incorrectly installed wiring, and overloaded circuits and extension cords.

**Panel Meeting Action:** Reject

**Panel Statement:** See the panel action and statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-152 Log #626 NEC-P02  Final Action: Reject (210.13)

**Submitter:** Kelli Heintz, Cottage Grove, WI

**Comment on Proposal No:** 2-154

**Recommendation:** Revise text to read as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Working for an insurance company I know how costly fires are in both financial and human loss. As a company, we spend a great deal of money training claims adjusters and our customers on fire prevention. Many fires are started by people carelessly overloading their outlets. This product will help reduce the number of fires caused by overloaded circuits. It’s tragic that these fires happen when there is now technology that will prevent them. While smoke detectors help warn once the fire is started, prevention would be much better. I have seen a demonstration of this technology and as an insurance industry employee and a mother I look forward to the day when I can use it in my home.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-153 Log #650 NEC-P02  Final Action: Reject (210.13)

**Submitter:** Thomas Dyer, Melrose Park, IL

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Too many children die in home fires each year. I have two children and work with a person who lost their house in a fire. Electrical fires in homes are close to 1,000,000 annually and a death to electrical shock happens in a home every other day.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-154 Log #651 NEC-P02  Final Action: Reject (210.13)

**Submitter:** Kayla Lischka, Rockford Public Schools Dist. 205

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** As an educator in public school, I see how horrible household fires are. Children die in fires more than 2 times the US National average. Working with a diverse population, I realize mobile home fires are nearly twice the average of other homes. The use of the overload fault circuit interrupter would have a major effect on lowering these statistics and saving children from fire. I was fortunate to actually see a demonstration of this circuit interrupter.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-155 Log #654 NEC-P02  Final Action: Reject (210.13)

**Submitter:** Ronald Ryerson, Sutter Health

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Many home fires start because of circuit overloaded that occur due to faulty appliances or overloaded wall plugs. My parents experienced such a fire in their home office many years ago while they were sleeping. Fortunately, the outcome was only minor fire and smoke damage to that portion of the home. But, many elderly people are killed by home fires caused by overloaded circuits. A wall plug which could protect against such occurrences would be a great safety feature for homes and offices. Also, it would be a boon to parents of young children if they could be guaranteed protection against electrocution or shock from conducting objects being inserted into outlets. I understand that the current types of protection against this occurrence is limited to nonconducting plug inserts being placed into the outlet, but all of these can usually be removed by most young children.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-156 Log #699 NEC-P02  Final Action: Reject (210.13)

**Submitter:** George Nelson, George Nelson Law Firm

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** I have represented people injured by electric shock due to faulty wall plugs and I know of overload electrical fires that have occurred in college dorms. If these can be prevented by the code requiring devices which prevent overloads, then it is time to put the requirement in the code and save lives and property loss.

**Panel Meeting Action:** Reject

**Panel Statement:** See the panel action and statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-157 Log #702 NEC-P02  Final Action: Reject (210.13)

**Submitter:** Karl W. Nolan, Jr., Rockford, IL

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Fire kills more Americans than all other natural disasters combined. And residential fires cause 80 percent of these fire deaths. Of all the causes of residential fires, electrical faults cause about 20 percent. Electrical faults are one of the only fire causes that can be prevented by technology. I have seen this new technology in demonstration and I believe this product can save lives and prevent electrical fires.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-158 Log #706 NEC-P02  Final Action: Reject (210.13)

**Submitter:** Thomas Lischka, Kewanee, WI

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Residential fires caused by electrical faults contribute to many injuries and deaths in the U.S. A large portion of these fires are caused by an electric current overload. Recently, I attended a demonstration of a new device called an Overload Fault Circuit Interrupter. This new technology can be used to prevent the current overload that causes these fires by shutting off any circuit that it detects an overcurrent draw and subsequently eliminate the overheating that causes fire. This same device was also able to detect overcurrent draw and disconnect a circuit when someone such as a child inserted a metal object into a receptacle. The current way of protecting a receptacle with a plastic outlet protector can be easily defeated by a child. I firmly believe this new device can greatly reduce the incidence of home fires and electrical shocks caused by overcurrent faults. I respectfully ask the Code-Making Panel to consider adding the requirement of this new technology into the 2008 National Electrical Code.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12
2-159 Log #711 NEC-P02 Final Action: Reject
(210.13)
Submitter: Marck Doerril, Marietta, GA
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: Safety for my family is of utmost importance. The overload fault technology provides the additional safety I need to better protect my family. If this technology can save just one more life, I think it’s worth the investment.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-160 Log #762 NEC-P02 Final Action: Reject
(210.13)
Submitter: Edward Hughes, Folsom, CA
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: In 2005, 381,000 home fires were reported with 3,030 deaths and 13,300 civilian injuries included in these reports. The fires resulted in almost 7 billion dollars in property damages. With these statistics in mind, I believe the Overload Fault Circuit Intercept should be mandated and included in the National Electrical Code. I am a retired realtor having dealt with tenant improvements in both commercial and private properties and this would have been a great construction addition at that time. As a senior citizen, age 73, I have also read that our group of citizens are the most vulnerable to home fires. These statistics have been interpreted by me from your website under National Fire Protection Association.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-161 Log #763 NEC-P02 Final Action: Reject
(210.13)
Submitter: Marlene Nolan, Belvidere, IL
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: Unknown to most, low levels of heat applied for extend periods of time can be a hazard. Organic compounds, like the plastic insulation on a wire or electrical plug, when warned for long periods of time will release carbon molecules. Carbon acts as a conductor. This carbon can change the property of an insulator not a conductor. Power cord insulation can become a low resistance path between a “live” and “return” wire pair, causing an overload in that portion of the circuit. Extreme overload in wires can heat them to the point of melting the insulation away from the wire, igniting adjacent flammables such as dust or igniting the insulation itself. I have seen this new technology in demonstration and I believe this product can save lives and prevent fires.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-162 Log #766 NEC-P02 Final Action: Reject
(210.13)
Submitter: James Shively, Rescue, CA
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: When somebody mentioned this product to me I did some research and found in a CPSC report how larger the electrical fire situation is. It would seem to me that your organization is in the vanguard of rectifying this situation. This product will stop this problem that I would think is absolutely necessary that the code mandate these products.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-163 Log #882 NEC-P02 Final Action: Reject
(210.13)
Submitter: Michael Auerbach, Highland Park, IL
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: We are a family with three active children. Every year, it appears that more and more technology, appliances or toys appeals to younger and younger children, and therefore, we find that our children are routinely using products that need to be plugged in. This can range from “WINNIE THE POOH” night lights that play music, to electronic keyboards for the older kids. We are aware that every year, 20 percent of residential electrical fires are caused by electrical faults. The National Fire Protection Association reports that approximately 41,500 residential fires are caused by electrical faults, and, according to the U.S. Consumer Product Safety Commission, approximately 400 deaths occur annually from electrical fires. From my experience of knowing a family whose house caught fire years ago, and the impact of that fire still remains today. The casualties in these fires are most likely the people who are least able to help themselves — children.
We understand that technology exists to prevent the types of situations that result in far too many fires and fatalities each year. We have seen a demonstration of a 25-volt single phase receptacle with an overload fault circuit interrupter. It is our opinion that any new technology or invention that can save even one life or prevent even one fire is worthwhile. It is our belief that this receptacle can do much more than that. We urge you to take whatever steps necessary to require this type of product or technology in every home so that unnecessary fires and injuries can be prevented. In a day and age when so much of our scientific knowledge is going to improve computers and virtual technology, it seems appropriate to focus on something that can go far to protect those we love.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-164 Log #901 NEC-P02 Final Action: Reject
(210.13)
Submitter: John Crymes, Jr., JMC Electrical Engineering
Comment on Proposal No: 2-154
Recommendation: As I understand it, millions of dollars and much public resource, Police, Fire Dept., and Court Litigation are unnecessarily used each year in the repair and prevention of electrical fires due to the overload of receptacles and, in particular substandard electrical extension cords. Seems to me that the inclusion of NEC specifications regarding the use of an overload protection fault device would be prudent.
Substantiation: To protect property and for personal safety, all 117 Volt Ac should have a code required overcurrent (1) protection device.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-165 Log #919 NEC-P02 Final Action: Reject
(210.13)
Submitter: Michael McQuade, E.I. DuPont de Nemours and Company Inc.
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter and Power Fault Circuit Interrupter protection.
Substantiation: I write this comment in response to your rejection of Proposal 2-154. I request you approve this proposal. You requested A) evidence that the proposed protective device would have prevented these fires. We have evidence of fires that have resulted in the substantiation and B) independent evaluation that the safety outlets will perform their intended function and that there will be no unintended consequences such as false tripping of the device.
A) The proposed devices would have prevented many of the fire incidents.
Such a statement is impossible to absolutely support, as we cannot reenact these disasters. It is generally difficult to even identify exact percentages of fire caused by different types of electrical faults. Often, post analysis of fires does not result conclusively in cause due to lack of remaining evidence.
Furthermore, the detailed analysis, including x-rays, is usually done by fire investigators, not by Fire Marshals, and paid for by a product manufacturing company that is trying to avoid liability. Therefore, this evidence is sealed from public viewing.
However, a qualitative survey of fire investigators consistently indicates three primary electrical causes of fires in the United States. We also have the experience of knowing a family whose house caught fire years ago, and the impact of that fire still remains today. The casualties in these fires are most likely the people who are least able to help themselves — children.

70-78
To prove the product reliability, safety and functionality, the SafePlug

2) Power Fault Circuit Interrupters (PFCI) that disconnect electricity to a load (appliance, extension cord, lamp, electronic device, etc.) when the load draws more current than it has been designed to accommodate. Circuit breakers are intended to protect interior wall wiring from overloads and do not protect against most loads adequately. The leakage current detection found in GFCIs and AFCIs trips in the rare situation when the overload is caused by a current path to ground, or when excessive heating from the overload leads to carbonization of materials leading to leakage currents or arcing. Therefore, this primary fault mechanism has virtually no existing protection in the electrical distribution system presently, being presently detectable only by secondary symptoms subsequent to excessive heating. In contrast, the OFCI can detect primary symptoms that occur before an immediate fire hazard exists.

b) Excess line voltage across a load, or

c) Inadequate voltage across a load.

High resistance connections are most often found in loose wire nuts or loose wire-bonding screw down connections. High-resistance connections can exist for years without causing a fire if little current flows through the connections. However, a 1 Ohm junction results in over 200 Watts of power dissipation with a load pulling 15 amperes through it. A high resistance junction with high current flowing through it can glow red hot and act as a fire ignition source. Investigators universally agree this to be the top cause of electrically-ignited fires.

Excess voltage across a load should not occur if the electrical system has been maintained properly. However, in a residential 2-leg system, if the common (Neutral) return path disappears, the leg voltage depends on the leg-to-leg ratio of load impedance. A load imbalance results in little voltage across low resistance on leg A and high voltage across high resistance load on leg B. For example, with 120 VAC per leg, nothing but a 25W load plugged into a leg A outlet and a 1500W load plugged into a leg B outlet, 236 VAC would drop across the 25W load and 4 V AC drop across the 1500W load. The 25W load would experience 400 percent the normal power dissipation and could easily overheat and act as an ignition source.

Inadequate voltage across a 120 VAC relay can cause relay chatter, where the voltage is too low to hold the normally-open relay closed. Thus, the relay continuously and cyclically opens and closes. You may have experienced the equivalent “chatter” effect on your car starter solenoid with a low battery. With a load attached, the chatter causes the relay contacts to overheat to the level where it can ignite fires. 120VAC relays are often used with motors. Furthermore, inadequate voltage can damage electronics.

To my knowledge, nothing presently required by the NEC within a residential electrical distribution system protects against these faults. I have provided a document that describes the technology itself in more detail. The document was written by a technologist at 2D2C, Inc. It describes generally how Overload Fault Circuit Interrupters, Power Fault Circuit Interrupters and Shock Fault Circuit Interrupters work. The document also describes the first products to implement OFCI and PFCI commercially. These products are the SafePlug Model 1200 and Model 1300 safety outlets made by 2D2C, Inc. ([www.safeplug.com](http://www.safeplug.com)).

B) Independent evaluation that the safety outlets will perform their intended function and that there will be no unintended consequences such as false tripping of the device.

To prove the product reliability, safety and functionality, the SafePlug products were tested against and exceeded the requirements of UL 498A (November 2005) and UL 498 (October 2006) for the US, and CSA C22.2 42-99 for Canada. See CSA International Master Contract 230670, Certification of Compliance 1660590.

Additionally, two independent fact-finding reports provide evidence of how the overload and power fault circuit interrupters would prevent the ignition of fires by the primary ignition techniques as discovered by fire investigation experts. These studies were performed by IFI International (February 2006) and by ETI InterTek Semko (December 2005).

The CSA fact finding report also tested the SafePlug product under extreme surge conditions, to match the tests applied to Ground Fault Circuit Interrupters. The SafePlug outlets not only survived the extreme surges but continued to operate as normal after experiencing the series of back-to-back surges. The products have also been designed to survive corrosive environments with zinc coated steel grounding yokes and solid brass terminal screws. For more details, please contact the product developers at OFI, Inc. I have provided copies of these fact finding reports.

In summary, these circuit interrupters must be implemented at the outlet location, not the circuit breaker panel location to be able to detect this bey of fire ignition source faults. The OFCI and PFCI supplement the preventative protection already provided by circuit breakers, by Arc Fault Circuit Interrupters (AFCI), and by Ground Fault Circuit Interrupters (GFCI). Nevertheless, circuit breakers, AFCI and GFCI cannot protect against the ignition sources described above.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action: Reject**

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-166 Log #951 NEC-P02 (210.13) **Final Action:** Reject

**Submitter:** Jerald Baldridge, Republic Energy Inc

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Seeking a reduction in the number of deaths from fires as well as costs of fire damage, costs of fire department expenses of the local committee, and hospital costs to the community.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-167 Log #1049 NEC-P02 (210.13) **Final Action:** Reject

**Submitter:** Scott Richter, Richmond, VA

**Comment on Proposal No:** 2-154

**Recommendation:** Revise as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Too many deaths, injuries, property damage, expense, loss of worker production hours are caused by fires and electrocution due to currently unsafe outlets in homes. If technology is in place now to prevent social loss ($2.2 billion estimate in 2000 by CPSC Chairman), the United States needs to take action now to implement and mandate such technology.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-168 Log #1244 NEC-P02 **Final Action:** Reject (210.13)

**Submitter:** Dianne E. Caso, Placerville, CA

**Comment on Proposal No:** 2-154

**Recommendation:** Revise text to read as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

**Substantiation:** Thousands of injuries and hundreds of deaths are attributed annually to electrically caused fires, electrocution and electric shock. Small children and the elderly are its most likely household victims. Like many parents, I have witnessed the fascination and determination with which toddlers approach electrical outlets, and the speed and ease with which they defeat plastic electrical protectors, current protective devices are not adequate. I have seen a demonstration of the overload fault technology, and as a concerned American, strongly recommend its inclusion in the 2008 National Electrical Code.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-169 Log #1247 NEC-P02 **Final Action:** Reject (210.13)

**Submitter:** Lawrence A. Caso, Placerville, CA

**Comment on Proposal No:** 2-154

**Recommendation:** Revise text to read as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: I have been electrocuted in the past. My personal experience has taught me that the danger is the greatest at the residential and commercial level where non-professionals are involved. There is no way to absolutely prevent the many ways we can be hurt and/or suffer property damage. However, the demonstrations of this technology, I have seen, come as close as possible. The CPSC, US NFPA, USFA, and Canadian CCFFM and FC statistics I have seen, warrant the mandating of this technology in as many locations and applications as possible and as soon as possible.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-170 Log #1271 NEC-P02 Final Action: Reject
(210.13)

Submitter: Bob Boutin, BE Safe Consultants, Inc.
Recommendation: Add new text to read as follows:
Electrical outlets in residential and commercial environments will not provide electrical current until a valid electrical plug is inserted.

Substantiation: My proposal was rejected due to a lack of independent testing. One company that makes a listed (CSA Certificate # 1818366) electrical outlet that meets my proposed criteria has provided me with a test report from ETL/InterTek that submitted the outlet to a variety of UL tests for false tripping and other testing to show that the outlet works properly for the proposed use. I have also modified the wording of the proposal to address the concerns of the panel as indicated in their response.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 2-177. In addition, it is uncertain what constitutes a “valid” electrical plug, as all plugs are manufactured to an industry standard for their particular application.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-171 Log #1315 NEC-P02 Final Action: Reject
(210.13)

Submitter: Robert Spare, Pasadena, CA
Comment on Proposal No: 2-154
Recommendation: Revise test to read as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.

Substantiation: Current protection devices do not adequately address the danger of electrical faults causing residential fires which has resulted in significant loss of life and property. I have witnessed a demonstration of the Overload Fault Circuit Interrupter (OFCI) and believe that mandating installation of the device would provide a major deterrent to fires caused by failure of current devices. Additionally, the OFCI would eliminate line to line shocks suffered by young children inserting metal objects into current electrical outlets. The safety enhancements and benefits of OFCI are compelling reasons for approval.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-172 Log #1334 NEC-P02 Final Action: Reject
(210.13)

Submitter: Frank-Paul King, Dallas, TX
Comment on Proposal No: 2-154
Recommendation: Revise text to read as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel

Substantiation: It is a fact that since, the introduction of the GFCl technology the number of deaths by electrocution has dropped significantly. We can reduce accidents and deaths with technology.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: Wade Wegner, King Shagle
Comment on Proposal No: 2-154
Recommendation: Revise text as follows:
All 25-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel

Substantiation: Recommend including a new provision that OFCI be included in the National Electrical Code. Comments: Close to 5% of home fires are caused by faulty or overloaded electrical distribution equipment according to The U.S. National Fire Protection Association citing the 2000 report from the CPSC whereby the staff estimated that there are 960,000 electrical fires in the US each year.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-174 Log #1356 NEC-P02 Final Action: Reject
(210.13)

Comment on Proposal No: 2-154
Recommendation: Revise test to read as follows:
All 25-volt single phase 15- and 20-ampere receptacles shall have Overload Fault Circuit Interrupter and Power Fault Circuit Interrupter Protection for Personnel

Substantiation: 2D2C, Inc., a US company, has developed several technologies to prevent the ignition of fires from excess heat due to electrical faults. These fire prevention technologies have been implemented in the form of circuit interrupters. The interrupters disconnect loads before adequate heat can be generated to ignite a fire. These interrupters supplement the preventative protection already provided by circuit breakers, by Arc Fault Circuit Interrupters, and by Ground Fault Circuit Interrupters. They fill the fire cause gaps that remain after implementation of these protective devices - they are complimentary and not redundant technologies that should be implemented in all residential wiring systems to prevent fires.

I personally learned about the technology at the NFPA Exposition in Orlando in June 2006. I received a demonstration of the technology as implemented in the SafePlug brand of electrical safety outlets. The technology works. And from my experience as a Fire Marshal, it will save lives by preventing a large number of fires. You can view an overview of the products at their website: www.safeplug.com. I am sure company representatives would travel to the NFPA review meeting to demonstrate the product. The contact that demonstrated the product to me and gave me NFPA sanctioned technical talk of the technology at the NFPA Expo was Steve Montgomery.

These primary causes of fires from electrical faults are outlined in three primary reference documents used in the fire investigation industry. These documents include the following:
- “Guide to Fire and Explosion Investigations”, NFPA 921

These documents all suggest that the top electrical causes of heat to ignite flammable materials consist of the following:
1. High current flowing through high resistance connections
2. Excess voltage across electrical device loads, and
3. Excess current flowing through electrical device loads

2D2C, Inc. has designed Fault Circuit Interrupters to remove the load after detecting these conditions. The heat source disappears if no current flows. Thus, although the Interrupter approach does not fix the wiring or load device problem, it prevents the calamity of ignition from the fault. Below is a simple description of what the two types of interrupters accomplish to prevent fires:
- Power Fault Circuit Interrupter (PFCI): Removes a load if it detects excess current flowing through a high resistance connection in the circuit OR if it detects excess AC Line utilization voltage across the device load
- Overload Fault Circuit Interrupter (OFCl): Removes a load if it detects excess current flowing into the load using a fast-trip, variable threshold, resettable breaker. The trip level matches the electrical load ampacity through RightPlug communication.

NOTE: PFCI and OFCI will prevent fires that presently occur in the presence of circuit breaker, AFCI and GFCI protection. The PFCI and OFCI protection is needed in a structural wiring system - protection does not presently exist for these faults. PFCI will prevent the super-heating of loose wire junctions inside wire nuts and screw connections that cause fires. PFCI will also protect against voltages up to 200-220 VAC across 120 VAC rated electrical devices caused by “floating neutral” conditions. OFCI will prevent against excess current heating in the small wires (18, 20, 22, 24 gauge) inside electrical
devices caused by poor maintenance, damage, abuse, improper designs, and poor quality manufacturing. OFCI also limits current through each 20 V AC outlet to a cumulative maximum of 5 amps or (as rated for the outlet type) 70-8 volts. It is impossible for anyone without the forensic evidence to accurately analyze the fire examples listed in Proposal 2-154. However, the OFCI covers many of the previous gaps in electrical fire protection.

As I am sure you know, the surveys that the NFPA conducts are mostly based upon Fire Marshal Reports. I am a member of the International Fire Marshals Association (IFMA) and have spoken to a number of Fire Marshals about the level of detail regarding their investigations. In addition to the fact that only about a third of the big fires leave enough evidence to trace back to the cause, very few of them have time or the forensic tools to dive in really deep to identify the specific cause. It is often an accomplishment for anyone to determine that an electrical fault, versus another ignition source, generated the fire, let alone what type of electrical fault caused it. The insurance company fire investigator gets more detail on cause, since they must try to indict one or more product manufacturers to assign the insurance payout burden away from the company. But the product liability defense attorney hired to prove the product manufacturer to be innocent, is the one with the best knowledge. He understands electricity very well, replicates ignition situations in his/her lab, and even X-rays burned electrical components (appliances, circuit breakers, etc.) to identify internal states to prove cause. Only these electrical forensic experts know the detailed fire cause facts, but rarely can they share them since the evidence is associated with a court case or simply held as confidential by the electrical appliance or device manufacturer.

To identify how many of electrically ignited fires would be prevented by OFCI, we interviewed several of these expert forensic electrical fire investigators including the following persons:

- Jim Finneran, ElectroTek Consultants Inc., 18925 SR 1, Spencerville, IN 46786, fire researcher, electrical forensic investigator, expert witness, co-author of "Fire Findings."
- John S. Robison, RobisonConsulting LLC, PO Box 680854, Prattsburg, AL 36068-0854, electrical forensic investigator, expert witness, ex Fire Marshal.

The general consensus is that the three primary electrical causes of fires consist of the following in order of prevalence:

1. High current flowing through high resistance connections
2. Excess voltage across electrical device loads, and
3. Excess current flowing through electrical device loads

None of these experts wanted to commit to percentages of specific electrical fire cause. All of them feel that high resistance connection is the common most electrical ignition source. Most estimated high resistance connections as causing 50 to 80 percent of all electrically induced fires. Most suggested that floating neutral problems (excess voltage across loads) are the next biggest cause of fires. Third, would be excess current draw through extension cords, lamps, appliances, electronics and other loads. The cause of excess current in a load device represents reduced impedance. Some causes of reduced load impedance include the following:

- Improper device use (e.g., oversized light bulbs)
- Poor product manufacturing quality (flaws)
- Poor product design
- Insulation breakdown and leakage through carbonization (age and fatigue)
- Locked motor motors (worn bearings, dirt)

Other electrical fire causes, such as induction, are extremely rare. The experts’ general opinion is that arcing from line to ground is usually a result of a fire, not the cause of a fire.

Note: Supporting material is available for review at NFPA Headquarters.
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If proposals are submitted in the future, Code-Making Panel 2 would benefit from receiving further information regarding the development of the parameters needed to detect high-resistance connections across the variety of branch circuit configurations and lengths in wiring systems, in the form of a fact-finding investigation.

These listing requirements are developed by a technical panel that includes representation from many areas of industry such as third-party testing and listing organizations, cord manufacturers, inspectors, and others. Code-Making Panel 2 fully expects the technical committee of the product standard to address any safety issues associated within the listing requirements of these cords and that a requirement of this type is not necessary in the NEC.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Comment on Affirmative:
KING, D.: The presentation given by the Submitter of this Comment at the ROC meeting was compelling. The panel was given the opportunity to review the potential of this new device to mitigate if not completely eliminate many electrically oriented fires that occur in dwelling units. This technology is new; therefore, the Panel is requesting for more information is warranted. Further information as requested in the Panel Statement will provide a better opportunity for acceptance of this new life saving technology in future Code cycles.

WEBER, R.: I feel the panel acted responsibly in rejecting this comment and proposal at this time frame. However, this is new and emerging technology “OFCI, Overload Fault Circuit Interrupter Protection”; is a means to asdf prevent fire scenes. In review of the substantiation submitted and supporting data on tests and state of these fire prevention technology systems; it has a potential for significantly expanding the type of measures available to the user for increased safety. Its benefit for shock protection at the outlet and ability to compliment the accepted uses of AFCI protection schemes can only have a positive effect for the end user. It is now and continues to be under the technological advancements and component reconfiguration to ease its acceptance for use by the general public. I encourage the submitter to continue the effort for OFCI acceptance in future versions of the code.

2-178 Log #1664 NEC-P02 Final Action: Reject

Submitter: Julie Wagner, Waukehsa, WI
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: I recently saw a demonstration for the Overload Fault Circuit Interrupter and am very interested in seeing this become part of the required building code for the following reasons:
My parents are elderly and live in a mobile home park in Florida. They live on a fixed income and try to scrimp and save wherever they can. I have seen them overload sockets and extension cords in their home. They have even used their stove as a heat source. I have pointed out to them the safety issues involved but they won’t buy another cord because “they don’t want to spend the money” and say “don’t worry, we’ll keep an eye on it.” If I buy a new cord, they’ll simply “save it to use when the old one wears out”. The Overload Fault Circuit Interrupter would certainly give me some peace of mind.
I think of the statistics put out by the U.S. Fire Administration: December is the most dangerous month for electrical fires because of the increase in lighting, heating and appliance use. The USFA also says that most electrical fires result from problems with “fixed wiring” and that 33 percent of residential fires are electrical in origin. Mobile homes have a fire death rate that is nearly twice the average of other dwellings.
My parents are only getting older. They are getting very forgetful. I do not live near them. I know they will be using space heaters soon. There are thousands of other elderly Americans just like them. USFA statistics say that 485 Americans die each year from electrical fires and injure 2,305 more. I do not want my parents to become one of those statistics.
Please give careful consideration to requiring the Overload Fault Circuit Interrupter in the building code.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-179 Log #1665 NEC-P02 Final Action: Reject

Submitter: Keith York, Granite Bay, CA
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: It seems to me that we have seen too many deaths and destroyed lives because of fires. I read some place that a majority of deaths caused by fire is directly caused by faulty electrical wiring systems. It seems to me that we have the technology to prevent these deaths so why aren’t we?
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-180 Log #1701 NEC-P02 Final Action: Reject

Submitter: Jack Maclead, San Marino, CA
Comment on Proposal No: 2-154
Recommendation: Revise as follows:
All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: I strongly recommend mandating installation of the Overload Fault Circuit Interrupter (OFCI) in new and remodeled construction, particularly residential. I attended a demonstration of the OFCI and witnessed successful overload and shock fault preventing. I am a retired CEO of a construction company and have been a commissioner of San Marino City for the past six years. This and other experiences have convinced me that electrical shock faults cause many unnecessary fires and deaths and any device such as the proven OFCI should be mandated.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-181 Log #1776 NEC-P02 Final Action: Reject

Submitter: Dieter Kays, Faithlife Financial
Comment on Proposal No: 2-154
Recommendation: All 125-volt single phase receptacles shall have Overload Fault Interrupter protection for personnel.
Substantiation: I just received a demonstration of the fire and shock prevention capabilities of the SafePlug product line. As CEO and President of Faithlife Financial (previously known as Lutheran Life Insurance), we want to encourage systems and practices that save as many lives as possible from accidental death and extend life where possible.
The Overload Fault Circuit Interrupter and Shock Fault Circuit Interrupter technology, if it is found to work effectively, could be a useful technology in preventing some deaths that are caused by certain fires.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-182 Log #2226 NEC-P02 Final Action: Reject

Submitter: Dieter Kays, Faithlife Financial
Comment on Proposal No: 2-154
Recommendation: Revise text to read as follows:
All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter Protection for personnel.
Substantiation: I just received a demonstration of the fire and shock prevention capabilities of the SafePlug product line. As CEO and President of Faithlife Financial (previously known as Lutheran Life Insurance), we want to encourage systems and practices that save as many lives as possible from accidental death and extend life where possible.
The Overload Fault Circuit Interrupter and Shock Fault Circuit Interrupter technology, if it is found to work effectively, could be a useful technology in preventing some deaths that are caused by certain fires.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-177.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-183 Log #2236 NEC-P02 Final Action: Reject

Submitter: Greg Baker, 2D2C, Inc.
Comment on Proposal No: 2-154
Recommendation: Revise text to read as follows:
All 125-volt phase receptacles shall incorporate Overload Fault Circuit Interrupter Protection for Personnel.
Substantiation: I am the president of 2D2C, Inc. My company has developed products that implement Overload Fault Circuit Interrupter technology that would satisfy proposals 2-154 and 2-155 (as well as 18-11, 12, and 13). These products are, and will be commercially available regardless of your actions for the 2008 NEC.
One of our products was listed by CSA in late 2005. We have sold some of this product without any marketing push. Our other OFCI product was recently listed. Now that we know that our high quality products exceed industry accepted safety standards, in addition to internal quality tests, we will commercially launch both products in the first quarter of 2007. While we strongly believe that this technology should be part of the NEC, our products do not need a change to the NEC to be used. Therefore, we will get the products into the marketplace to prevent fires and save lives.

We have established manufacturing capabilities to support the significant demand that we expect for these products. We have included in our manufacturing plans, contingencies for additional production capacity if you choose to include this technology in the 2008 NEC. We are working with several companies that will provide additional sources of products utilizing OFCI technology through both licensing and brand labeling agreements.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-184 Log #2262 NEC-P02 Final Action: Reject

**(210.13)**

**Submitter:** John S. Robison, Robison Consulting, LLC

**Comment on Proposal No:** 2-154

**Recommendation:** Revise text to read as follows:

All 125-volt single phase receptacles shall have Overload Fault Circuit Interrupter protection.

**Substantiation:** I sincerely request that you accept the proposed technology described in Proposals 2-154 and 2-155. A company called 2D2C, Inc. (www.2d2c.com) has developed a simple approach to protecting against incorrect sizing of light bulbs to fixtures. The technology is called Overload Fault Circuit Interrupter (OFCI). I witnessed this technology in operation at an NFPA conference and found that it was exactly as described. Based upon my expertise, OFCI would eliminate most fires caused by improperly sized light bulbs if it was installed. From my experience, the only way to ensure that this OFCI technology prevents these fires, is to require its usage. If it is optional, it will not get used and these fires will continue.

Simply stated, OFCI is effectively a resettable fast-trip breaker located in the outlet or in a light fixture. The light fixture version of OFCI has a fixed trip-current level that matches the light fixture rating. If the wrong size light bulb is installed in the fixture, the OFCI disconnects electricity to the bulb and will toggle power to the light with a very low duty cycle until it detects a current draw below its trip threshold and then resets itself.

The OFCI electrical outlet version has 14 different trip-current levels and automatically matches its trip level to the device rating plugged into each receptacle independently. Outlet OFCI reads this trip level from RightPlug receptacle independently. Outlet OFCI reads the trip level from RightPlug receptacle independently. Outlet OFCI reads this trip level from RightPlug encoding inside the plug (www.RightPlug.com). The RightPlug encoding requires apartment building owners to provide annual maintenance to the outlets.

I presently act as an expert investigator for fire cause and am a retired fire marshal. As such, I have personal experience with identifying the cause of fires frequently. In my opinion, OFCI would eliminate most fires caused by improperly sized light bulbs if it was installed. From my experience, the only way to ensure that this OFCI technology prevents these fires, is to require its usage. If it is optional, it will not get used and these fires will continue.

I believe this is a good way to keep fire protection and life safety to a specific standard method of wiring. With it being on a dedicated fire safety circuit, it has a far less chance of being mistakenly disabled or shutdown, due to an overloaded circuit that has been tripped.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel statement on Comment 2-177.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-186 Log #2128 NEC-P02 Final Action: Reject

**(210.15)**

**Submitter:** Michael Moulton, Farmington, NH

**Comment on Proposal No:** 2-157

**Recommendation:** None given.

**Substantiation:** I believe this is a good way to keep fire protection and life safety to a specific standard method of wiring. With it being on a dedicated fire safety circuit, it has a far less chance of being mistakenly disabled or shutdown, due to an overloaded circuit that has been tripped.

**Panel Meeting Action:** Reject

**Panel Statement:** The submitter has not provided any recommendation as required by 4.4.5(c) of the NFPA Regulations Governing Committee Projects.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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2-187 Log #439 NEC-P02 Final Action: Reject

**(210.18)**

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 2-158

**Recommendation:** Accept revised:

Add “dormitories” before “guest” in the heading and text.

**Substantiation:** Dormitories in colleges, recreational camps, and penal institutions are as much or more akin to dwelling units than most hotel or motel rooms. The addition of “dormitories” was accepted in Proposal 2-242 for 210.60(A).
Panel Meeting Action: Reject
Panel Statement: The term “dormitories” is too broad to be included in 210.18. This can include prison dorms, military barracks, as well as many other occupancies described in local building codes. The limited revision in 210.60 is related only to the required receptacles and receptacle placement.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
KING, D.: The Panel has not addressed the submitter’s concerns that there are inconsistencies in the minimum branch circuit requirements in these types of occupancies that are similar to and function as dwelling units. The same minimum branch circuit installation requirements should apply to these types of occupancies. Section 210.60(A) requires receptacles in Dormitories to be installed to the minimum standard of dwelling units. These receptacles should be supplied by branch circuits that meet the minimum requirements of dwelling units. I disagree with the Panel that “the term ‘dormitories’ is too broad to be included in 210.18.” The term could have been more clearly defined by describing the types of occupancies where the requirements of Section 210.18 should apply. This could have been accomplished by accepting in principal this Comment with the submitter’s text revised to read as follows: “and in dormitories in colleges, penal institutions, recreational camps, etc.” after “Hotels” in the text and heading.

WEBER, R.: The panel action should have been to accept this comment or accept in principle at best and included the term “sleeping rooms and areas in educational dormitories.” When reviewing the building codes Residential Group R this type of use and similar area is defined or classified by the terms, “For sleeping accommodations such as apartment houses, convicts, dormitories, fraternities and sororities in part.” The comments made in the negative vote in Comment 2-140 are valid here as well. The panel needs to recognize and review the actual uses in the field; that these are living units and although some may not legally allow provisions for cooking, many do and they should have a requirement in the code to have branch circuits installed to meet the rules for dwelling units. Many AHJs are forced to make that call on experience and the 90.4 authority to accomplish the submitter’s recommendation. If the normal use is there, the code should address it, and if the units do not have those provisions, then it does not apply. At the time of construction is the time to provide the needed circuitry. The designers, installers, inspection community and user need this positive code text.

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Comment on Proposal No: 2-162
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 17 for action within Article 422.

This action will be considered by Code-Making Panel 17 as a public comment.

Substantiation:
This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel adopts the direction of the TCC to consider Proposal 2-162. The panel rejects Proposal 2-162.

The submitter of Proposal 2-162 has not provided substantiation to show that household electric ranges, wall-mounted ovens, and counter-mounted cooking equipment have created a loss of property or life to justify the additional requirements for GFCI protection. These appliances are inherently designed to handle heat. Other household cooking equipment should already be protected by GFCI-protected kitchen counter receptacles per 210.8(A)(6).

Number Eligible to Vote: 10
Ballot Results: Affirmative: 9
Ballot Not Returned: 1 Gill, C.

2-188 Log #1900 NEC-P02 Final Action: Accept in Principle in Part (210.19(A)(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 2-166
Recommendation: Either reject the proposal, OR revise the final paragraph of Annex D, Example D3(a) to read as follows:

“Although because the neutral runs between the main switchboard and the building panelboard, likely terminating on a busbar at both locations, the busbar connections are part of listed devices and not separately installed pressure devices,” and not on overcurrent devices, the effects of continuous loading can be disregarded in evaluating its terminations (see 215.2(A)(1)) Exemption No. 2.

Exception No. 2. Therefore 210.14(C)2 does not apply, and the normal termination temperature limits apply. In addition, the listing requirement to gain exemption from the additional sizing allowance under continuous loading can be disregarded in evaluating its terminations (see 215.2(A)(1)). Therefore, since the minimum size equipment grounding conductor for a 160 ampere circuit, as covered in Table 250.122, is 6 AWG, that is the minimum neutral size required for this feeder.

Substantiation: The present wording of Example D3(a) substantiates rejecting this proposal. However, assuming CMP 2 has decided to rethink the technical conversation involved, then the wording of Example D3(a) must be adjusted accordingly. This comment puts both options on the table for the panel to consider.

Panel Meeting Action: Accept in Principle in Part
Revise the last paragraph in Annex D Example D3(a) as follows: Although because the neutral runs between the main switchboard and the building panelboard, likely terminating on a busbar at both locations, the busbar connections are part of listed devices and not separately installed pressure devices, and not on overcurrent devices, the effects of continuous loading can be disregarded in evaluating its terminations (see 215.2(A)(1)).

Exception No. 2. Therefore 210.14(C)2 does not apply, and the normal termination temperature limits apply. In addition, the listing requirement to gain exemption from the additional sizing allowance as well. Therefore, since the lighting load is continuous, the minimum conductor size is based on 1.25x That calculation is (11,600 VA / 277V) = 42 amperes, to be evaluated for the 75°C column of Table 310.16. The minimum size of the neutral might seem to be 8 AWG, but that size would not be sufficient to be depended upon in the event of a line-to-neutral short circuit (see 215.2(A)(1), second paragraph). This size is also the minimum size required by 215.2(A)(1). Therefore, since the minimum size equipment grounding conductor for a 160 ampere circuit, as covered in Table 250.122, is 6 AWG, that is the minimum neutral size required for this feeder.

Panel Statement: The panel accepts the revision to Annex D, but not the recommendation to reject the proposal. The word “are” as it appears in the original text is also being deleted in the first sentence.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-189 Log #1009 NEC-P02 Final Action: Reject (210.19(A)(1), FPN 4)

Submitter: David Shapiro, Accurate & Intriguing Writing & Editing

Comment on Proposal No: 2-168
Recommendation: Revise text to read as follows:
...and where the maximum total drop from nominal voltage on feeders and branch circuits to the farthest outlet...

Substantiation: The Panel Statement agrees that, “The fine print note...does not cover all possible causes for the voltage drop.” I have had multiple conversations over a long period that demonstrated clearly that the text does not cover all possible causes for the voltage drop.” I have had multiple conversations over a long period that demonstrated clearly that the text does not cover all possible causes for the voltage drop. The reason that I suggest the additional wording, “from nominal voltage” is that the FPN is advising about proper operation of utilization equipment. This is affected not by what VD testers report—the drop from initially supplied voltage, in response to a simulated load—but by voltage significantly lower than its design voltage. Electricians have only partial control over this, but certainly more control than “feeders and branch circuits” implies.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree that the recommendation adds any clarity to the section. The text refers to feeders and branch circuits as they apply to Articles 210 and 215.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-190 Log #506 NEC-P02 Final Action: Reject (210.19(A)(2))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 2-169
Recommendation: Accept proposal to include “outlets”.

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2-191 Log #2265 NEC-P02 Final Action: Reject
(210.21(A))

Submitter: Michael Beanland, Vancouver, WA
Recommendation: Add:
Manufacturers of AFCI devices shall make documentation on the reliability
(ability to detect typical arc faults), selectivity (ability to distinguish between
faults and non-fault activity) and security (ability to react to arc faults and not
react to non-fault activity) for their AFCI devices available to users.
Substantiation: If AFCI devices are only “intended” to provide protection,
documentation of performance should be required to verify manufacturer’s
success are meeting this “intention.”
Panel Meeting Action: Reject
Panel Statement: The panel recognizes that the submitter is referencing
210.12 with this comment. The intended arc protection provided by AFCIs is
defined in UL 699. Additional documentation is unnecessary.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-192 Log #433 NEC-P02 Final Action: Reject
(210.21(B)(2) and Table 210.21(B)(2))

Submitter: Dan Leaf, Seneca, SC
Recommendation: Accept proposal.
Substantiation: See substantiation for this proposal and Proposal 2-174. This
section does not allow for large office areas or suites to have multiple outlets
with special configuration receptacles such as twistlock types to provide power
for floor polishers or carpet cleaners, which in effect limits the load to one
utilization equipment and, therefore, meets the definition of individual circuit.
Testing labs indicate a receptacle can carry its rated load. This requirement
does not appear to relate to 90.1(A) and (B).
Panel Meeting Action: Reject
Panel Statement: The maximum loading values are part of the entire system
of branch circuit safety requirements. The submitter has not substantiated
deleterious section. Deletion of the section would simply allow equipment to
run at continuous ratings up to the rating of the receptacle. This would remove
a portion of the safety margin built into the system.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-193 Log #434 NEC-P02 Final Action: Reject
(210.21(B)(2) and Table 210.21(B)(2))

Submitter: Dan Leaf, Seneca, SC
Recommendation: Accept proposal.
Substantiation: This section is virtually unenforceable. Receptacles are tested
and listed to supply a load up to their rating which suggests there is no safety
hazard. 90.1 indicates the purpose of the code is safeguarding from hazards.
What hazard is involved in a receptacle supplying its rated load current? This
limitation appears intended to provide for additional or future current use for
other outlets which is not in accordance with 90.1(B).
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-192.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-194 Log #774 NEC-P02 Final Action: Reject
(210.21(B)(1))

Submitter: William Riggenbach, Riggs Electric
Recommendation: Revise text to read as follows:
Single receptacle device on an individual branch circuit. A single receptacle
device installed on an individual branch circuit shall have an amperage rating not
less than that of the branch circuit.
Substantiation: A single 15 amp duplex receptacle is allowed on a 20
amp circuit under 210.21(B)(3) i.e., ...two or more receptacles...and
Table 210.21(B)(3). This limits the receptacle load to 12 amps per Table
210.21(B)(2). It also creates a fire hazard should an equipment using 16
amps if connected to the receptacle. This is a standard practice in the Atlanta,
GA area. I have seen this situation on 20 amp circuits for microwave ovens,
heaters, etc., including bathroom GFC and REC. Requiring a 20 amp rated
receptacle (device) whether single or duplex would eliminate this problem.
Panel Meeting Action: Reject
Panel Statement: Allowing a 15 ampere receptacle on a 20 amp branch circuit
does not pose a hazard since all 15 ampere receptacles are evaluated for 20
amperes of current through the entire assembly. The submitter’s contention
that a 16 ampere load could be connected to a single 15 ampere receptacle is
incorrect, since that would require a 20 ampere cord cap on the equipment in
accordance 210.21(B)(2).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-195 Log #773 NEC-P02 Final Action: Reject
(210.21(B)(3))

Submitter: William Riggenbach, Riggs Electric
Comment on Proposal No: 2-8
Recommendation: Add new text to read as follows:
20 amp circuit conductors connected to a 15 amp receptacle must be made
by means of splicing the conductors and bringing out a tap in accordance with
Table 210.24.
Substantiation: Current practice allows using the 15 amp duplex receptacle(s)
for continuity of the 20 amp circuit. Conductors generally are stabbed into
the back of a residential grade 15 amp duplex receptacle. This includes both
the feed conductors and the circuit continuation. This effectively inserts the
equivalent of a short piece of 15 amp wire at each receptacle location.
This creates a fire hazard. I have encountered at least 2 of these where arcing has
resulted, and burning of the receptacle was in evidence. In one, active was
occurring even as I was removing the receptacle to replace it. In this instance,
a 1500 watt heater was plugged into the circuit downstream of this receptacle.
This 1500 watt load, added to the existing half of table lamps, a large screen
projection TV and surround sound system, caused a load in excess of 15 amps
and began the burning process.
As well as being a licensed electrician since 1975, I am also a retired Miami
(Fl) fire captain. I can tell you this is a very real fire hazard. It was not
allowed in South Florida, but goes on routinely here in Georgia.
Note: Supporting Material is available for review at NFPA Headquarters.
Panel Meeting Action: Accept
Panel Statement: The substantiation provided by the submitter is incorrect.
Since 15 ampere receptacles are evaluated for 20 amps of “feed through”
current, a splice/tap arrangement is not technically substantiated. The panel
also notes that relative to the submitter’s drawing, the “quick wire” holes that
are referenced are, by the UL standard, limited to #14 AWG wire and as such
a 15 ampere circuit maximum. Receptacles are not permitted to have #12
AWG inserted into the backs of receptacles for a feed through, “quick wire”
connection.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-197 Log #20 NEC-P02 Final Action: Accept
(210.52)

Submitter: Technical Correlating Committee on National Electrical Code®,
Comment on Proposal No: 2-190
Recommendation: It was the action of the Technical Correlating Committee
that consideration be given to using a list format as recommended in 2.1.5.1,
3.3.1.2, and 3.3.2 of the NEC Style Manual.
This action will be considered by the Panel as a Public Comment.
Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 2-198.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-198 Log #843 NEC-P02 Final Action: Accept
(210.52)

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 2-190
Recommendation: Revise the first paragraph of 210.52 to read as follows:
210.52 Dwelling Unit Receptacle Outlets. This section provides requirements
for 125-volt, 15- and 20-ampere receptacle outlets. The receptacles required by
this section shall be in addition to any receptacle that is:

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Most AFCIs over the last 2 years have been installed in new dwelling units in a format as recommended by the TCC note for Proposal 2-90. Some of the concerns that we have at this point in time is that there are no AFCIs and to date have not. Manufacturers have had years to produce a product for sale that meets these requirements for commercial use and testing since the original inception of AFCIs and to date have not. Manufacturers have had years to produce a product for sale that meets these requirements for commercial use and testing since the original inception of AFCIs. What was confusing about the matter was that if I moved the position that it has reviewed sufficient technical data that warrant the use of AFCIs and to date have not. Most AFCIs over the last 2 years have been installed in new dwelling units which on a normal basis do not have any problems with these as faults for quite a few years to come if at all, unless there was an installation error. This alone along with the use of AFCIs in conjunction with GFCIs which are common throughout dwelling unit living areas. This is of grave concern to the industry because there have been issues with AFCIs that are not always reported. The contractor will simply return what seems to be the defective product and install a new one if it works. The reasons for this is because when you call the supplier or manufacturer they do not always have a reason why you are having issues. This was very common with GFCIs when they first came out and is true of any new product. Until additional equipment is available, you may not be able to meet the requirement of the proposed code for every application that may arise. This, again, will add to the cost to implement them as proposed, above and beyond the cost of the breaker.

Most AFCIs over the last 2 years have been installed in new dwelling units which on a normal basis do not have any problems with these as faults for quite a few years to come if at all, unless there was an installation error. This alone along with the use of AFCIs in conjunction with GFCIs which are common throughout dwelling unit living areas. This is of grave concern to the industry because there have been issues with AFCIs that are not always reported. The contractor will simply return what seems to be the defective product and install a new one if it works. The reasons for this is because when you call the supplier or manufacturer they do not always have a reason why you are having issues. This was very common with GFCIs when they first came out and is true of any new product. Until additional equipment is available, you may not be able to meet the requirement of the proposed code for every application that may arise. This, again, will add to the cost to implement them as proposed, above and beyond the cost of the breaker.

Most AFCIs over the last 2 years have been installed in new dwelling units which on a normal basis do not have any problems with these as faults for quite a few years to come if at all, unless there was an installation error. This alone along with the use of AFCIs in conjunction with GFCIs which are common throughout dwelling unit living areas. This is of grave concern to the industry because there have been issues with AFCIs that are not always reported. The contractor will simply return what seems to be the defective product and install a new one if it works. The reasons for this is because when you call the supplier or manufacturer they do not always have a reason why you are having issues. This was very common with GFCIs when they first came out and is true of any new product. Until additional equipment is available, you may not be able to meet the requirement of the proposed code for every application that may arise. This, again, will add to the cost to implement them as proposed, above and beyond the cost of the breaker.

The panel understands that the submitter is referring to 210.12. The submitter’s substantiation is anecdotal in nature and lacks the necessary technical data to support his recommendation. Product malfunction, if there is an issue, should be addressed to the manufacturers. The panel notes that the acceptance of Proposal 2-142 is based on the commercial availability of products designed for AFCI protection, and may have been developed before the first time in hearing our comments and look forward to working with you in the future. As an organization made up of electrical contractors and associate members consisting of many suppliers within the area we hope that you will take the time to consider these issues before making a decision. We thank you for your time in hearing our comments and look forward to working with you in the future. Panel Meeting Action: Reject
2-200 Log #1300 NEC-P02 Final Action: Reject
(210.52)

Submitter: Steven Roncourt, Roncourt Enterprises Inc
Comment on Proposal No: 2-190
Recommendation: Please consider the remarks below before making a decision on this proposal.
Substantiation:
1. It is unclear to me whether or not the language proposed by the panel is in favor of or against having a half switched receptacle with 2 outlets in this location to meet this requirement. With 20 years experience in the residential industry, I believe that a half switched receptacle as stated above does not pose a safety condition. I have been installing them for over 20 years and have never had a complaint from a customer concerning this. I do not believe in installing a receptacle that is completely controlled by a wall switch, this does create a condition for a possible safety hazard. A half switched receptacle should be allowed if this proposal is approved.
2. That being said, I disagree with the submitter’s substantiation with concerns to the switch being left in the off position if this is not changed. It has been my experience that it is just the opposite. The switch is left in the on position to allow access to the receptacle, therefore, not causing the issue described in the substantiation, but creating an issue with 210.70(A)(1). Why would someone completely disable a receptacle instead of just leaving it on to utilize it? These remarks in my opinion are completely wrong and there was no supporting documentation with any technical information.
3. It is also my experience with my 20 plus years in the electrical industry that the NEC has provided for sufficient receptacle placement under 210.52 and that on average the majority of people in a bedroom because of 210.52, do not have more than 1 device plugged into a receptacle at one time. If this proposal does not allow for a half switched receptacle, you will now have to install a quad receptacle with one of them being switched or an additional receptacle with two outlets directly adjacent to the one required under 210.70(A)(1). This seems like this would only cause more confusion on the part of the consumer. I hope that the panel will consider these issues when making your decision.
Panel Meeting Action: Reject
Panel Statement: The submitter’s recommendation is unclear and does not provide specific text. Regarding the points in the submitter’s substantiation, the comment about leaving the switch on is exactly the issue that is being resolved. Section 210.70(A)(1) requires a switch-controlled lighting outlet, which could be a receptacle in accordance with Exception No. 1. If the switch is left in the “ON” position, the requirement for a switch-controlled lighting outlet is defeated. Subsequently, a duplex receptacle that is only 1/2 switched would meet the requirements of both 210.70 and 210.52.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-202 Log #2020 NEC-P02 Final Action: Reject
(210.52)

Submitter: Lawrence Brown, National Association of Home Builders (NAHB)
Comment on Proposal No: 2-190
Recommendation: Reject the proposed change.
Substantiation:
The proposed change, developed by the Panel, referring to 210.70(A)(1) Exception No. 1, should not be accepted. The other modification to this section of deleting the word “outlets” is correct in the application of the NEC and should be accepted. The intent of Section 210.70(A)(1) is to provide “switch-controlled lighting” for habitable rooms. The exception to this rule is to allow a design feature of a switched receptacle to be used in lieu of a switch controlled lighting outlet in the ceiling or wall. It is a matter of design. There is no basis, nor was any supporting documentation presented, the support the submitter’s belief that it is a “common” practice to “leave the switch” controlling a duplex receptacle “permanently in the closed position.” Nor is there any substantiation to support the “switch will either be left in the “ON” position [defeating the purpose of 210.70(A)(1)], or (perhaps more likely) an extension cord will be run across a traveled area from a receptacle not controlled by the switch.”
The receptacle required by 210.70(A)(1) is a receptacle that could easily be used for a lighting fixture for the room whether or not the receptacle is switched. This design feature of convenience should not be penalized as a basis to require additional general lighting wall receptacles.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-200.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-203 Log #2151 NEC-P02 Final Action: Reject
(210.52(4)(4))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 2-198
Recommendation: Proposal 2-198 should be an “Accept in Principle” with the revised proposed text for 210.52(A)(4) to read as follows:
11. Receptacle outlets in floors shall not be counted as part of the required number of receptacle outlets unless located within 450 mm (18 in.) of the wall.
2. A receptacle outlet in a listed floor box shall be installed at least 1.8 m (6 ft) from the wall in rooms other than basements, kitchens, bathrooms, garages and swimming pool rooms that are 60 m² (625 ft²) in area or greater and where one wall is not less than 900 mm (3 ft) from the center of the room. A receptacle outlet in a listed floor box shall be installed for each 60 m² (625 ft²) in area in a room.
Substantiation: This proposal should be Accepted in Principle. Panel 2 discussed how cord lengths have been shortened from 6 ft to 5 ft. As stated in the original proposal: “The lack of a sufficient number of available receptacle outlets leads the homeowner to use extension cords. The NEC has long recognized the hazards presented by the use of extension cords, especially where extension cords are used in place of permanent wiring. With the proliferation of cord connected home entertainment systems, computer equipment, electronic games, multiple TVs, appliances, etc., it is evident that the number of receptacles required 50 years ago is no longer adequate for today’s home. The addition of floor receptacles as recommended in this proposal will help to ensure that there are a sufficient number of receptacles available for connection of the large number of cord connected appliances now being used in the typical dwelling.” When floor boxes are installed in large rooms then the number of extension cords used will be reduced.
The location for the floor box was increased to a minimum 1.8 m (6 ft) per Ray Weber’s negative comment.
Panel Meeting Action: Reject
Panel Statement: Requiring the placement of receptacles in the floors of dwelling unit areas of 625 sq. ft. or more, located at least 6 ft. from the wall, in areas that may have no furniture or other provisions for interior design specifications, is not practical and has not been substantiated. If a floor receptacle were required in such areas, it could still end up underneath furniture which, if still used by the homeowner, would be a hazard in itself.
Add immediately following 20.52(A)(2)(2):

receptacle outlet required in 20.50(C) does not satisfy the requirement for laundry in addition to the appliance receptacle outlet required in 20.50(C).”

WEBER, R.: The panel should have accepted in principle the comment the submitter in offering “at least 1.8 m (6 ft) from the wall,” in large room areas of over 60 m sq (625 sq ft), does address a need that should have positive code text to provide mandatory requirements; it could be restated in the text to allow it to be located anywhere in the room provided it is greater than 1.8 m (6 ft) from the wall. In the panel statement, the interior furniture layout is a design feature and a true statement, but at least one receptacle would have to be installed and then the coordination of its location is up to the designer, electrical installer and owner as to where it should be placed. As we review building trends going to larger size dwelling units, with rooms over the indicated size; the use of extension cords are often times the only solution to deal with the electrical outlet needs of the owner. It is always repeated that the electrical code is not a design manual, it does start as a minimum base line for what must be done to electrical systems and by not addressing changes in building sizes and room uses as to needs of receptacle locations other than just the wall area is unfortunate and not in the public best interest. Thus, the minimum standard becomes the maximum requirement and many will not do any more than that to meet the code, irregardless of the increasing extent factor. If there is positive code text, then the AHJ does not have to go back to 90.4 for developing a local code requirement or addition for a receptacle outlet in a listed floor box, to be installed.

2-205 Log #666 NEC-P02 Final Action: Reject (210.52(A))

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 2-195

Recommendation: This Proposal should have been Accepted in Principle in Part with the following action:

Add an additional phrase to the first sentence of 210.52(F) “in addition to the appliance receptacle outlet required in 210.50(C)” so the sentence reads as follows:

“In dwelling units, at least one receptacle outlet shall be installed for the laundry in addition to the appliance receptacle outlet required in 210.50(C).”

Substantiation: The additional phrase will make it clear that the appliance receptacle outlet is required in 210.50(C) does not satisfy the requirement for the additional receptacle outlet required in 210.52(F). This change will not require any additional receptacles in the laundry area, but will add clarity to the requirements.

Panel Meeting Action: Reject

Panel Statement: The submitter is incorrect in that the appliance receptacle requirement for a washer or gas dryer, in order to meet 210.50(C), does not meet the requirement for 210.52(F). This proposed change would require an additional receptacle to be installed but does not provide substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-206 Log #667 NEC-P02 Final Action: Reject (210.52(A))

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 2-195

Recommendation: This Proposal should have been Accepted in Principle in Part with the following action:

Accept the addition of “foyer,” in 210.52(A). The remainder of 210.52(A) should read as shown in the 2005 NEC.

Add immediately following 210.52(A)(2)(2):

Exception to (1) and (2): In foyers, a receptacle outlet shall not be required where the unbroken wall space is less than 1.2 m (4 ft) in width or less than 1.8 m (6 ft) from the opposite wall.

Substantiation: I agree with Mr. King’s Explanation of Negative Vote.

In the foyer of a typical two-story, one-family home, there can be three doorways (front entry, closet, and basement stairs), three openings (living room, dining room, kitchen), and one stairway. There are several wall spaces that would be 5 feet or more in width and could cover foyers with a width greater than 1.8 m (6 ft) from the opposite wall.

In the foyer of a typical two-story, one-family home, there can be three doorways (front entry, closet, and basement stairs), three openings (living room, dining room, kitchen), and one stairway. There are several wall spaces that would be 5 feet or more in width and could cover foyers with a width greater than 1.8 m (6 ft) from the opposite wall.

In the foyer of a typical two-story, one-family home, there can be three doorways (front entry, closet, and basement stairs), three openings (living room, dining room, kitchen), and one stairway. There are several wall spaces that would be 5 feet or more in width and could cover foyers with a width greater than 1.8 m (6 ft) from the opposite wall.

2-207 Log #1308 NEC-P02 Final Action: Accept (210.52(A)(1))

Submitter: Joseph A. Hertel, Safety and Buildings

Comment on Proposal No: 2-197

Recommendation: I support the action on this proposal.

Substantiation: The submitter must realize that the NEC is by its own intent (Section 90.1(C)) is not a design specification. While agreement can be reached that additional receptacles may provide some degree of additional safety, they can always be added by exceeding the minimum requirements of the NEC. If as the explanation of one of the negative votes says that product standards have changed to allow the use of shorter cords it is these standards that should be modified to reflect the length needed for compliance with the NEC without the use of extensions.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1
KING, D.: See my explanation of negative on Comment 2-208.

Comment on Affirmative:

BROWN, L.: Please see my Ballot Comment on Comment 2-208. The NEC (NFPA 70) is a standard on the minimum provisions for safe electrical installations. It is not a standard for "electrical convenience".

KING, D.: See my explanation of negative on Comment 2-208.

KING, D.: I disagree with the Panel that it is not necessary to lessen the 6 ft usable for the situation in which the fixture is reasonably expected to be not used to power all of the related equipment. As for the fixture cord length, "Reason" for this Proposal is also flawed and one would be hard pressed to cited statistics by having a receptacle one-foot closer then is now required. The proposal change did not provide any means that would change any of the figures are significantly lower then CPSC cited in the Proposal. But absolutely, with only 30 deaths, and 60 civilian injuries. Again, with no data to show the dwelling units, thus reducing the risk of fires. Changing the spacing requirement for receptacle outlets to be in line with the minimum cord length as defined in the most recent product standards will aid in the reduction of the number of extension cords used.

Panel Meeting Action: Reject

Panel Statement: The panel disagrees with the suggestion that it is necessary to lessen the required 6 ft spacing to accommodate the manufacturer’s decision to shorten their appliance cords to 5 ft.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

KING, D.: I disagree with the Panel that it is not necessary to lesson the 6 ft spacing requirement to 5 ft. Receptacle spacing should be coordinated with the product standards to reduce the number of extension cords used in dwelling units. The 6 ft spacing requirement in the NEC was initially implemented to be in line with the cord manufacturer’s product standards. The intent of this revision is not to accommodate the product manufacturer’s decision to shorten their cord length as stated by Panel 2 but rather to require a minimum standard for receptacle spacing to reduce the number of fires associated with the use of extension cords. Panel 2 should give this comment further consideration.

LAROCCA, R.: The present rule in Section 210.52(A)(1), that requires receptacles to be installed so that no point measured horizontally along the floor line is more than 6 ft from a receptacle outlet, has been in the NEC since the mid-1950’s. At that time the length of the flexible cord used on an appliance or lamp. The substantiation also proposal noted that the 6 ft receptacle spacing is based on the standard length of the flexible cord used on an appliance or lamp. The substantiation also quoted earlier editions of the NEC handbook which stated, “This rule intends that an appliance or lamp with a flexible cord attached may be placed anywhere in the room and be within 6 ft of a receptacle”. However, many UL standards for portable electric products, such as the Standard for Portable Electric Lamps UL 153, now require a cord length of 1.5 m (5 ft).

This comment revises the current receptacle spacing from 6 ft to 4 ft. The 4 ft spacing accommodates the likelihood that a table lamp or other cord connected appliance will be located on a table top or similar raised surface which effectively reduces the distance that flexible cord will reach along the wall to the receptacle. The 4 ft spacing also takes into account locating a receptacle at the standard stud spacing in typical residential construction.

The NEC requirement for the 6 ft receptacle spacing has not been changed in at least 50 years. In the least 50 years there has been a significant increase in the capacity of the service equipment. It is common today to have a service rated for 150, 200 amps or greater compared to a rating of 60 amps in the 1950’s. These higher ratings are due not only to the larger size of homes but also to the increased demands of the electrical equipment used in a typical residence. Although not all of the increase is due to cord connected electrical equipment, there are cord connected electrical products in use today that were not envisioned 50 years ago. Cord connected products such as home entertainment systems, multiple televisions, electronic gaming systems, transformers, air purifiers, air fresheners, etc., all require connection to a receptacle. If a sufficient quantity of receptacles is not provided at convenient spacing than it is likely that extension cords will be used. This proposal is intended to reduce the use of extension cords. The original proposal substantiation cited the CPSC report that documents the death and injury incidents associated with the use of extension cords.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 2-208.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

KING, D.: This Comment should have been accepted in principal with a revised spacing maximum of 5 ft. A maximum spacing of 5 ft, aligns the cord manufacturer’s product standard with the spacing requirement in the NEC. See my explanation of negative on Comment 2-208.

PAULEY, J.: The revision in the product standards that allowed appliance cords to be reduced to 5 ft in length is sufficient substantiation to make the change to the receptacle spacing. The reduced cord length can result in more use of extension cords in order to reach a receptacle.

Comment on Affirmative:

BROWN, L.: Please see my Ballot Comment on Comment 2-208. The NEC (NFPA 70) is a standard on the minimum provisions for safe electrical installations. It is not a standard for "electrical convenience".

KING, D.: The revision in the product standards that allowed appliance cords to be reduced to 5 ft in length is sufficient substantiation to make the change to the receptacle spacing. The reduced cord length can result in more use of extension cords in order to reach a receptacle.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 2-208.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

KING, D.: This Comment should have been accepted in principal with a revised spacing maximum of 5 ft. A maximum spacing of 5 ft, aligns the cord manufacturer’s product standard with the spacing requirement in the NEC. See my explanation of negative on Comment 2-208.

PAULEY, J.: The revision in the product standards that allowed appliance cords to be reduced to 5 ft in length is sufficient substantiation to make the change to the receptacle spacing. The reduced cord length can result in more use of extension cords in order to reach a receptacle.

Comment on Affirmative:

BROWN, L.: Please see my Ballot Comment on Comment 2-208. The NEC (NFPA 70) is a standard on the minimum provisions for safe electrical installations. It is not a standard for "electrical convenience".
2-211 Log #2150 NEC-P02 Final Action: Reject
(210.52(A)(1))

Submitter: David H. Kendall, Carlon

Comment on Proposal No: 2-197

Recommendation: Proposal 2-197 should be an “Accept in Principle” with the revised proposed text for 210.52(A)(1) to read as follows:

210.52(A)(1) Spacing. Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 1.8 m (6 ft) from a receptacle outlet.

Substantiation: I agree with the substantiations submitted with the NEMA Proposal and Comment. I agree with the 4 ft spacing because when using 6 in. studs, the outlet would be located on the 6 in. stud (5.33 ft) away.

Panel Meeting Action: Reject

Panel Statement: I support the panel action and statement on Comment 2-208.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 4 Negative: 3

Explanations of Negative:

KING, D.: This Comment should have been accepted in principle with a revised spacing maximum spacing of 5 ft. A maximum spacing of 5 ft. aligns the cord manufacturer’s product standard with the spacing requirement in the NEC. See my explanation of negative on Comment 2-208.

PAULEY, J.: See my Explanation of Negative Vote on Comment 2-209.

Comment on Affirmative:

BROWN, L.: Please see my Ballot Comment on Comment 2-208. The NEC (NFPA 70) is a standard on the minimum provisions for safe electrical installations. It is not a standard for “electrical convenience”.

Final Action: Accept

2-212 Log #1309 NEC-P02 Final Action: Accept
(210.52(A)(4))

Submitter: Joseph A. Hertel, Safety and Buildings

Comment on Proposal No: 2-198

Recommendation: I support the panel action.

Substantiation: The submitter must realize that the NEC is by its own intent (Section 90.1(C)) is not a design specification. While agreement can be reached that additional receptacles may provide some degree of additional safety, they can always be added by exceeding the minimum requirements of the NEC.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanations of Negative:

KING, D.: See my explanation of negative on Comment 2-203.

Final Action: Accept

2-213 Log #2246 NEC-P02 Final Action: Reject
(210.52(B)(1))

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 2-201

Recommendation: The proposed language should be accepted.

Substantiation: The panel should reconsider and accept this change. The panel statement said that the word “covered” was used in place of the word “required” in an attempt to make it clear that all of the receptacles installed in the kitchen, pantry, breakfast room, dinning room, or similar area of a dwelling unit be supplied by the two or more small appliance branch circuits. Based on the debits of this issue, both in the field and in the online code forums, this attempt was not successful. The code language in this proposal would make the panel’s intent completely clear and enforceable.

Panel Meeting Action: Reject

Panel Statement: The panel agrees that this submitters has not provided adequate substantiation in order to change the use of these terms.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Final Action: Accept

2-214 Log #2021 NEC-P02 Final Action: Reject
(210.52(B)(1) Exception No. 2)

Submitter: Lawrence Brown, National Association of Home Builders (NAHB)

Comment on Proposal No: 2-199

Recommendation: Change “counter” in the subsection to “countertop” to be consistent throughout the section as follows:

210.52 Dwelling Unit Receptacle Outlets

(C) Countertops. In kitchens and dining rooms of dwelling units, receptacle outlets for countertop spaces shall be installed in accordance with 210.52(C)(1) through (C)(5). Where a range, counter-mounted cooking unit, or sink is installed in an island or peninsular countertop and the width of the counter behind the sink, counter-mounted cooking unit, or sink is less than 300 mm (12 in.), the range, counter-mounted cooking unit, or sink is considered to divide the countertop into two separate countertop spaces as defined in 210.52(C)(4). Each separate countertop space shall comply with the applicable requirements in 210.52(C).

Substantiation: It should be noted that Section 210.52(B)(1) Exception No. 3 already allows the receptacle outlet for refrigeration equipment to be on an individual branch circuit of 15 amperes or greater. I see no reason to limit individual circuits for these types of permanently installed appliances, such as the disposer and dishwasher, that would not require a circuit rated greater than 15 amperes. I believe the panel statement is somewhat misleading in its assertion that Section 210.52(B)(1) and the proposed text relate only to the countertop receptacles that are covered in Section 210.52(B)(3) and 210.52(C). In other words, I do not believe the panel statement is a good response to the submitter’s substantiation. If the Panel believes these appliances are already allowed to be on a circuit(s) that do not supply the receptacles as outlined in Section 210.52(B)(1), it should be acknowledged.

Panel Meeting Action: Reject

Panel Statement: The panel agrees that this change is not necessary. The only reason I say there is an exception for refrigeration equipment is that refrigeration equipment is specifically required to be on the small-appliance branch circuit. The current Code does not prohibit receptacles in the kitchen that are other than countertop (210.52(C)) or wall spaced (210.52(A)) to be on 15- or 20-ampere circuits appropriately rated for the equipment.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-215 Log #21 NEC-P02 Final Action: Accept
(210.52(C))

Submitter: Technical Correlating Committee on National Electrical Code®,

Comment on Proposal No: 2-207

Recommendation: The Technical Correlating Committee directs that the panel accept this Proposal be correlated with Figure 210.52 by changing the title of the Figure to “Figure 210.52(C)(1)’” to comply with 2.3.1 of the NEC Style Manual, and change the Table titles from “Sink or range…” to “Range, counter-mounted cooking unit or sink…” to correlate with Panel Actions on this Proposal and Proposals 2-211 and 2-218.

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal as to the placement of the proposed text within 210.52(C).

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Revise Figure 210.52 as follows:

The panel takes the following actions:

(1) Place the text of the recommendation in Proposal 2-207 as modified by the panel action text and make it a second paragraph to 210.52(C).

(2) The panel accepts changing the title of the figure to “Figure 210.52(C)(1)’” Determination of Area Behind a Range, Counter-Mounted Cooking Unit or Sink.

(3) The panel directs that the labels on the figures in the ROP Draft be changed to reflect the accepted panel change from Proposal 2-206a. This will change the words “Outlets not required.” to “Space exempt from wall line measurement.”

(4) The captions for both figures should be changed from “Sink or range…” to “Range, counter-mounted cooking unit or sink…” to be consistent with the text of the Exception to 210.52(C)(1).

Panel Statement: The panel accepts the direction of the TCC to clarify the panel action. The panel has also made the appropriate changes to the labels within the figures to match the text accepted in Proposal 2-206a.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

2-216 Log #973 NEC-P02 Final Action: Accept in Principle
(210.52(C))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.

Comment on Proposal No: 2-207

Recommendation: Change “counter” in the subsection to “countertop” to be consistent throughout the section as follows:

210.52 Dwelling Unit Receptacle Outlets

(C) Countertops. In kitchens and dining rooms of dwelling units, receptacle outlets for countertop spaces shall be installed in accordance with 210.52(C)(1) through (C)(5). Where a range, counter-mounted cooking unit, or sink is installed in an island or peninsular countertop and the width of the counter behind the range, counter-mounted cooking unit, or sink is less than 300 mm (12 in.), the range, counter-mounted cooking unit, or sink is considered to divide the countertop into two separate countertop spaces as defined in 210.52(C)(4). Each separate countertop space shall comply with the applicable requirements in 210.52(C).

Report on Comments A2007 — Copyright, NFPA 70-90
In kitchens and dining rooms, revise the first sentence in 20.52(C) to read as follows:

Panel Meeting Action: Accept in Principle
Revise 210.52(C), (C)(1), (C)(2), and (C)(3) as follows:
The panel agrees to change the words “Counter” to “Countertop” throughout the text in 210.52(C), (C)(1), (C)(2) and (C)(3).
Panel Statement: The panel agrees with the concept but accepted the comment in principle because the submitter included language in the subsections that does not take into account other changes that were made in the NOP.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-219 Log #2324 NEC-P02 Final Action: Accept in Principle (210.52(C))
Submitter: Ken Brewer, Tampa JATC / Rep. IBEW 915
Comment on Proposal No: 2-205
Recommendation: The panel should Accept this Proposal.
Substantiation: The panel’s recognition that receptacles installed for counter tops in the additional proposed areas are served by the 20 amp small appliance branch circuits per 210.52(B)(1) does not take into consideration the spacing and location requirements of 210.52(C)(1) through (5). The current requirements do not indicate that the proposed counter tops in the proposed areas could be served by receptacles located beneath the counter tops and be exempt from the horizontal spacing requirements of 210.52(C)(1) through (5). The proposed requirements insure that receptacles are correctly placed so as to prevent the need to drape cords over the edge of, and/or extend for excess lengths, above counter tops areas.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 2-218.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-220 Log #22 NEC-P02 Final Action: Accept (210.52(C)(2))
Submitter: Technical Correlating Committee on National Electrical Code®, Comment on Proposal No: 2-216
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 2-207. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to reconsider Proposal 2-216 and correlate with the action on Proposal 2-207. By rejecting Proposal 2-216, the text has been standardized as “range” through the panel action on Comment 2-215 to Proposal 2-207.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-221 Log #59 NEC-P02 Final Action: Accept in Principle (210.52(C)(3))
Comment on Proposal No: 2-118
Recommendation: We support the panel’s action. We recommend the Technical Correlating Committee correlate this proposal with Proposal 2-207.
Substantiation: None given.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 2-218.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-222 Log #1201 NEC-P02 Final Action: Accept in Principle (210.52(C)(3))
Submitter: James W. Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 2-218
Recommendation: We support the panel’s action of Accepting in Principle the Proposal.
Substantiation: Changing the word “rangetop” to “range, counter-mounted cooking unit or..” will add clarity to the original proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 2-221.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-223 Log #1011 NEC-P02 Final Action: Reject (210.52(C)(4))
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 2-220
Recommendation: Revise text to read as follows:
(4) Separate Spaces. Countertop spaces separated by appliance garages or other permanently-installed accessories, where these extend from the back of the countertop to within less than 300 mm (1 ft) of the front, or by rangetops, refrigerators, or sinks shall be considered as separate countertop spaces in applying the requirements of 210.52(C)(1), (C)(2), and (C)(3).
Substantiation: The CMP’s comment that appliance garages may not split countertops, because there is room for (foreign) appliances in front of them, should be addressed by this emendation. Much the same concern seems to be at issue with Proposal 2-215, so my proposed revision attempts to address that as well.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree that any improvement in safety or receptacle spacing is gained by allowing the appliance garage to split the countertop space.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-224 Log #2022 NEC-P02 Final Action: Accept (210.52(D))
Submitter: Lawrence Brown, National Association of Home Builders (NAHB)
Comment on Proposal No: 2-224
Recommendation: Accept the proposed change.
Substantiation: Contrary to the committee statement, the current exception is actually a rule. Reading both the section text and the exception text, the required receptacle can be located either in a wall or partition, or on the side or face of the basin. What is the exception? This would also apply to Section 210.5(C)(5). In this day and age of providing greater accessibility to those who are disabled, of limited ability, and the 50+ population, the Panel should not consider accessibility to electrical receptacle outlets an exception to the rule.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-225 Log #1336 NEC-P02 Final Action: Accept in Principle (Table 210.52(E))
TCC Action: The Technical Correlating Committee understands the panel action on this comment changes the text in 210.52(E)(1) in the panel action on Proposal 2-224.
Submitter: Kevin McCall, Local Union #98 IBEW
Comment on Proposal No: 2-231
Recommendation: Revise text as follows:
For a one-family dwelling each unit of a two-family dwelling that is at grade level, at least one receptacle outlet accessible while standing at grade level and not more than 2.0 m (6 ½ ft) above grade shall be installed at the front and back of the dwelling. When the dwelling unit is located at grade level and provided with individual exterior entrance/egress, at least one receptacle outlet accessible at grade level and not more than 2.0 m (6 ½ ft) above grade shall be installed.
Substantiation: I agree with Mr. Weber, in the panel should have not accepted this language revision due the full range of persons using the code. Simplified language allows for easier understanding of the code requirements and decrease the slight discrepancies between what the code language is actually stated.
Panel Meeting Action: Accept in Principle
Revise the wording in 210.52(E)(1) in theROP text to read as follows:
“(1) One-Family and Two-Family Dwellings. For a one-family dwelling and each unit of a two-family dwelling that is at grade level, at least one receptacle outlet accessible while standing at grade level and located not more than 2.0 m (6 ½ ft) above grade shall be installed at the front and back of the dwelling.”
Panel Statement: The revised wording meets the intent of the submitter and provides clarity.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-226 Log #1342 NEC-P02 Final Action: Accept in Principle (210.52(E))
Submitter: Janet D. Skipper, Ocoee, FL
Comment on Proposal No: 2-229
Recommendation: Continue to accept this proposal in principal using the panel recommended text.
Substantiation: The submitter of this proposal has identified an unsafe condition that currently exists in many dwelling units. Without the addition of the proposed text, electrical cords will be passed through doorways to access available receptacle outlets installed indoors to supply power to lighting and equipment located on balconies, decks and porches. This practice increases the risk of damage to cords, thus, increasing the risk of fires. The proposed text will provide a safe means of electrical power that is accessible at these locations.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 2-227.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative: BROWN, L.: See my Ballot Comment on Public Comment 2-230. In addition “readily accessible”?

2-227 Log #1411 NEC-P02 Final Action: Accept in Principle in Part (210.52(E))
Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 2-229
Recommendation: Continue to Accept in Principle and revise the text as follows:
(E) Outdoor Outlets. Outdoor receptacle outlets shall be installed in accordance with (E)(1) through (E)(3).
(1) One-Family and Two-Family Dwellings. For a one-family dwelling and each unit of a two-family dwelling that is at grade level, at least one receptacle outlet accessible at grade level and not more than 2.0m (6 ½ ft) above grade shall be installed at the front and back of the dwelling.
(2) Multifamily Dwellings. For each dwelling unit of a multifamily dwelling where the dwelling unit is located at grade level and provided with individual exterior entrance/egress, at least one receptacle outlet accessible from grade level and not more than 2.0 m (6 ½ ft) above grade shall be installed.
(3) Balconies, Decks and Porches. Balconies, decks and porches that are attached to the dwelling unit and are accessible from inside the dwelling shall have at least one receptacle outlet installed that is readily accessible while from on the balcony, deck or porch.
Substantiation: Adding the terms “readily accessible” and “on” will insure that the receptacle can be easily reached by a person standing on the balcony, deck or porch. Use of the terms “readily accessible” and “on” should also prevent considering a receptacle that is located inside the building that can be reached through a door or window as being considered the receptacle that meets this requirement.
Panel Meeting Action: Accept in Principle in Part
Revise the (E)(3) wording from Proposal 2-229 to read:
“(3) Balconies, Decks, and Porches. Balconies, decks, and porches that are accessible from inside the dwelling unit shall have at least one receptacle outlet installed within the perimeter of the balcony, deck, or porch. The receptacle shall not be located more than 2.0 m (6 ½ ft) above the balcony, deck, or porch surface.”
Panel Statement: The panel agrees with the submitter’s request to provide clarity to the location of the balcony, deck, or porch receptacle and offers revised text to accomplish this. The panel does not agree that “readily accessible” is a better word choice than “accessible” when considering the definitions of these terms from Article 100.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative: BROWN, L.: See my Ballot Comment on Public Comment 2-230. In addition “readily accessible”?...

2-228 Log #1448 NEC-P02 Final Action: Accept in Principle (210.52(E))
Submitter: Larry Cross, IBEW Local 98
Comment on Proposal No: 2-231
Recommendation: I agree with R. Weber. The Panel should have accepted this proposal as submitted.
Substantiation: None.

70-92
The installation of a receptacle for usable deck areas would seem appropriate, BROWN, L.: The Panel's Action of adding an Exception for small landing, KING, D.: I disagree with the Panel that a minimum dimension of 20 sq. etc. is appropriate and important.

Ballot Results: Affirmative: 12

2-229 Log #1452 NEC-P02 Final Action: Accept in Principle (210.52(E))

Submitter: James O’Driscoll, IBEW Local #98
Comment on Proposal No: 2-231
Recommendation: I agree with the submitter and Mr. R. Weber. Substantiation: Mr.R. Weber makes it very clear why this proposal should have been accepted as submitted. “While Standing” should be added to this section.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel statement on Comment 2-225.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-230 Log #2023 NEC-P02 Final Action: Accept in Principle (210.52(E))

TCC Action: The Technical Correlating Committee directs that “20 sq. ft” be revised to be read “1.86 m² (20 ft²)” in compliance with the NEC Style Manual Units of Measurement.
Submitter: Lawrence Brown, National Association of Home Builders (NAHB)
Comment on Proposal No: 2-229
Recommendation: Reject the proposed change until additional study of the typical porch, deck or ornamental railing space configurations can be related to the proposed change.
Substantiation: Concerning new 210.52(E)(3): It would be more appropriate for there to be a minimum size balcony, deck, or porch for the application of this provision. This was discussed at the ROP meeting, some members would consider exterior area in front of a door used for solely ventilation a “balcony”, just because there is the installation of a protective guard (railing) to prevent falls. In reality there is no actual floor space. Also, many designs of high-rise multifamily buildings include a very small standing area, perhaps 3 feet by 6 feet, a place for fresh air and a place to have a smoke and not contaminate the interior environment. There is barely room for a single chair. The Panel should consider the use of the deck area relative to the need for a receptacle. For a floor space that is a result of a designed ventilation opening, a receptacle would be of no practical use.

It should also be noted that for all multifamily construction the guards are required to be a minimum of 42 inches in height above the deck surface. For the small deck areas the guard usually is attached to the building directly adjacent to the door frame. This provides no wall surface with the guard to install a receptacle. If the receptacle was to be installed it would be located approximately 46 inches above the deck surface, and due to structural framing around the door would be located 12 or more inches outside the deck area. There is little room for a single chair. The Panel should consider the use of the deck area relative to the need for a receptacle. For a floor space that is a result of a designed ventilation opening, a receptacle would be of no practical use.

Explanation of Negative:
KING, D.: I disagree with the Panel that a minimum dimension of 20 sq. ft should be a condition for this requirement. If a porch, deck or balcony is accessible and intended for use by occupants of the dwelling, the receptacle should be required regardless of the minimum dimension. The purpose of this section is to eliminate the use of cords through doorways to supply electrical equipment at these locations. Cords passed through doorways are a potential cause for electric shock and fire due to damage that can easily occur on a cord where it passes through the doorway. Acceptance of this Comment will allow this hazardous condition to continue to exist for porches, decks and balconies that are less than 20 sq. ft.

Comment on Affirmative:
BROWN, L.: ‘The Panel’s Action of adding an Exception for small landing, etc. is appropriate and important.

In fact, the 20 Square Foot dimension may be too small. As written, one could interpret that a single-step 5-foot by 5-foot (25 S.F.) “landing” at an exterior door is a “porch”. Clearly, the landing is only there because it is required by the building code. It serves no other purpose than to provide easy entry, and exit from a building. A screen door may swing over the landing and there is no usable space on the landing. There are also the instances for upper-floor rooms where an extremely small exterior area in front of a door used for solely ventilation would be considered a “balcony”, just because there is the installation of a protective guard (railing) to prevent falls. Without the Exception, these small landings and exterior shelves at ventilation doors would require a receptacle that would never be used.

In response to the Ballot Comment by Mr. King: You need to go back and review the original proposal on this matter. No data was presented to show there is a correlation with extension cords and the possibility of holiday lighting being located on a deck railing. For all we know, an outside receptacle was available for all of these situations. Nor was any data provided to show extension cords are being run through exterior doorways.

WEBER, R.: There is a need for a receptacle in this space; however in the ROP phase in Proposal 2-229, and panel discussion on the intent of the requirement area limits were discussed. Due to the varied uses a size limitation for an exception was not supported at that time; by accept in principle, of this comment the panel has now exempted area of “less than 20 sq ft” from having to have a receptacle. This is too large of an area and the panel should have retained the original text of Proposal 2-229, which addressed many other contingencies of use. By accepting this exception, the user has to use a cord through a door or window to provide an outlet in those smaller spaces in violation of 400.8(3). I do not want to lose this requirement in the code so I am voting in the affirmative, but wish to go on record that the exempted space is going to be used and a required receptacle should have been afforded in that space irregardless of size.

2-231 Log #2024 NEC-P02 Final Action: Accept in Principle (210.52(E))

Submitter: Lawrence Brown, National Association of Home Builders (NAHB)
Comment on Proposal No: 2-228
Recommendation: Reject the proposed change until additional study of the typical porch, deck or ornamental railing space configurations can be related to the proposed change.
Substantiation: Concerning new 210.52(E)(3): It would be more appropriate for there to be a minimum size balcony, deck, or porch for the application of this new provision. As was discussed at the ROP meeting, some members would consider exterior area in front of a door used for solely ventilation a “balcony”, just because there is the installation of a protective guard (railing) to prevent falls. In reality there is no actual floor space. Also, many designs of high-rise multifamily buildings include a very small standing area, perhaps 3 feet by 6 feet, to allow for fresh air and a place to have a smoke and not contaminate the interior environment. There is barely room for a single chair. The Panel should consider the use of the deck area relative to the need for a receptacle. For a floor space that is a result of a designed ventilation opening, a receptacle would be of no practical use.

It should also be noted that for all multifamily construction the guards are required to be a minimum of 42 inches in height above the deck surface. For the small deck areas the guard usually is attached to the building directly adjacent to the door frame. This provides no wall surface with the guard to install a receptacle. If the receptacle was to be installed it would be located approximately 46 inches above the deck surface, and due to structural framing around the door would be located 12 or more inches outside the deck area. There is little room for a single chair. The Panel should consider the use of the deck area relative to the need for a receptacle. For a floor space that is a result of a designed ventilation opening, a receptacle would be of no practical use.

Explanation of Negative:
KING, D.: The Panel’s Action of adding an Exception for small landing, etc. is appropriate and important.

In fact, the 20 Square Foot dimension may be too small. As written, one could interpret that a single-step 5-foot by 5-foot (25 S.F.) “landing” at an exterior door is a “porch”. Clearly, the landing is only there because it is required by the building code. It serves no other purpose than to provide easy entry, and exit from a building. A screen door may swing over the landing and there is no usable space on the landing. There are also the instances for upper-floor rooms where an extremely small exterior area in front of a door used for solely ventilation would be considered a “balcony”, just because there is the installation of a protective guard (railing) to prevent falls. Without the Exception, these small landings and exterior shelves at ventilation doors would require a receptacle that would never be used.

In response to the Ballot Comment by Mr. King: You need to go back and review the original proposal on this matter. No data was presented to show there is a correlation with extension cords and the possibility of holiday lighting being located on a deck railing. For all we know, an outside receptacle was available for all of these situations. Nor was any data provided to show extension cords are being run through exterior doorways.

WEBER, R.: There is a need for a receptacle in this space; however in the ROP phase in Proposal 2-229, and panel discussion on the intent of the requirement area limits were discussed. Due to the varied uses a size limitation for an exception was not supported at that time; by accept in principle, of this comment the panel has now exempted area of “less than 20 sq ft” from having to have a receptacle. This is too large of an area and the panel should have retained the original text of Proposal 2-229, which addressed many other contingencies of use. By accepting this exception, the user has to use a cord through a door or window to provide an outlet in those smaller spaces in violation of 400.8(3). I do not want to lose this requirement in the code so I am voting in the affirmative, but wish to go on record that the exempted space is going to be used and a required receptacle should have been afforded in that space irregardless of size.
2-232 Log #2247 NEC-P02 Final Action: Reject
(210.52(E))

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 2-233
Recommendation: This proposal should be accepted.
Substantiation: There were four proposals to change this section. All of them made the point that the required outside dwelling unit receptacle(s) should be accessible “from grade” and not “at grade” as in the current code wording. There is no safety or any other logical case that can be made to show that a receptacle “accessible from grade” presents any type of problem. The design of many single family dwelling units makes compliance with the current wording impossible as they have porches or decks that cover the complete front or back of the dwelling unit.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that we intend to use the words “at grade” not “from grade”. See panel statement on Comment 2-225 for further clarification.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-196 Log #1082 NEC-P02 Final Action: Accept in Principle
(210.52(E)(3))

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 2-229
Recommendation: Revise the 210.52(E)(3) from the ROP to read as follows: (3) Balconies, Decks and Porches. Balconies, decks and porches that are attached to the dwelling unit and are accessible from inside the dwelling shall have at least one receptacle outlet installed that is readily accessible from on the balcony, deck or porch.

Substantiation: This revision is intended to remove the confusion about where an accessible receptacle can be located to meet this requirement. During the panel discussions, it was clear that the panel intended that a receptacle be installed so that you could utilize it while ON the balcony, deck or porch. The words “…accessible from the…” in the ROP accepted text implies that a receptacle that you could get to by walking down the steps from the balcony or deck would meet the requirements.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 2-227.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative: BROWN, L.: Please see my Ballot Comment on Public Comment 2-230.

2-233 Log #1666 NEC-P02 Final Action: Reject
(210.52(E)(3))

Submitter: James Grant, Rochester, NH

Comment on Proposal No: 2-229
Recommendation: Revise as follows: (3) Balconies, Decks and Porches. Balconies, decks and porches that are attached to the dwelling unit and are accessible through doorways from inside the dwelling shall have at least one receptacle outlet installed accessible from the balcony, deck or porch.

Substantiation: By adding this text, it will exclude balconies, whose only means of access is through a window, that are furnished solely for an area of refuge during a fire as permitted by NFPA 101.

Panel Meeting Action: Reject
Panel Statement: The panel notes space accessible only through a window is not a balcony, deck, or porch.
See the panel action and statement on Comment 2-227.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative: BROWN, L.: ‘See my Ballot Comment on Public Comment 2-230. In addition “readily accessible”?

2-234 Log #1053 NEC-P02 Final Action: Reject
(210.52(F) Exception 3 (New))


Comment on Proposal No: 2-236
Recommendation: Accept proposal.
Substantiation: The panel noted Proposal 2-95 indicates that the present requirement is a “minimum” but if the “minimum” for the equipment is 30 amperes why can’t that be the accepted minimum? The 20 amp receptacle serves no purpose.

Also, please see comment on Proposal 2-96.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that the existing text provides for the minimum installation and may require an additional circuit for compact or stacked laundry equipment. See panel statement on Comment 2-67.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-204 Log #1995 NEC-P02 Final Action: Accept in Principle
(210.52(G))

Submitter: Lawrence Brown, National Association of Home Builders (NAHB)

Comment on Proposal No: 2-240
Recommendation: Reject the proposed change.
Substantiation: This is nonsense. The addition of the term “general-use” to describe a typical receptacle adds absolutely no additional clarification to these provisions. Looking at the 2005 NEC, this term is only used in Article 220 (Branch-Circuit, Feeder, and Service Calculations); 440.62(C) (Air-conditioning and Refrigerating Equipment - Provisions for Room Air-Conditioners); and 552.46(B)(3) (Park Trailers - Branch Circuits - General Appliances). But, what is a “general-use” receptacle? There is no definition, as there is for “General-Use Switch”, in the NEC. Regarding the submitter’s substantiation, adding this term will provide no more enforcement of having a usable receptacle in these locations than the current language already provides. What would ever make someone think a single receptacle is not a “general-use” receptacle? If you really want to address the submitter’s purported problem, make these receptacles in addition to any other receptacle used for equipment installed in those areas.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 2-237.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-235 Log #23 NEC-P02 Final Action: Accept
(210.52(G))

Submitter: Technical Correlating Committee on National Electrical Code®,

Comment on Proposal No: 2-240
Recommendation: It was the action of the Technical Correlating Committee that the panel reconsider the proposal relative to the grammar and the use of complete sentences. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel has revised the text as Accepted in the panel action on Comment 2-237 to reflect the proper grammar.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-236 Log #1012 NEC-P02 Final Action: Accept in Principle
(210.52(G))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 2-240
Recommendation: Revise text to read as follows: For a one-family dwelling, at least one receptacle outlet, in addition to any provided for the laundry equipment or for any fixed equipment, shall be installed in each basement and in each attached garage, and in each detached garage with electric power. See 210.8(A)(2) and (A)(5). Where a portion of a basement is finished into one or more habitable rooms, each separate unfinished portion shall have an additional receptacle outlet installed in accordance with this section.
Substantiation: The concern described in Mr. Mark Shapiro’s substantiation was that these receptacles might be confused with those serving fixed equipment. It seems better to state this explicitly rather than to introduce a term, as Mr. Lawrence Brown notes.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action on Comment 2-237, as it meets the submitter’s intent.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-237 Log #1083 NEC-P02 Final Action: Accept in Principle in Part
(210.52(G))

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 2-240
Recommendation: Revise the 210.52(G) from the ROP to read as follows: (G) Basements and Garages. For a one-family dwelling, the following provisions shall apply: (1) At least one receptacle outlet, in addition to those for specific equipment, shall be installed in each basement and in each attached garage, and in each detached garage with electric power.
2-239 Log #690 NEC-P02 Final Action: Reject (210.60(A))

Submitter: Timothy M. Croushore, Allegheny Power

Comment on Proposal No: 2-242

Recommendation: Please reject the original proposal.

Substantiation: The explanation of negative by Mr. Purvis is correct. Also, Mr. Brown’s affirmative comment is also correct. Dormitories are engineered occupancies dependent on the individual housing wishes of the college or university. The dormitory occupancies can be designed with or without cooking, with or without bathrooms, showers and sinks.

No technical substantiation of any hazards or problems has been provided by either the submitter or the members of the code-making panel to add dormitories to the occupancies needing to comply with 210.60(A).

Panel Meeting Action: Reject

Panel Statement: The panel does not agree with the submitter’s intent. See action taken on Panel Comment 2-238a (Log # CC200).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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Wally Harris, Atlantic Inland Inspections

Comment on Proposal No: 2-252

Recommendation: Revise the text of this Proposal to read as follows: 210.70 Lighting Outlets Required. Lighting outlets shall be installed where specified in 210.70(A), (B), and (C).

(A) Dwelling Units. In the dwelling units, lighting outlets shall be installed in accordance with 210.70(A)(1), (2), and (3).

(1) Habitable Rooms. At least one wall switch-controlled lighting outlet shall be installed in every habitable room and bathroom, with switch control provided at each entrance to these rooms.

(2) Additional Locations. Additional lighting outlets shall be installed in accordance with (A)(2)(a), (A)(2)(b), and (A)(2)(c).

(a) At least one wall switch-controlled lighting outlet shall be installed in hallways, stairways, attached garages, and detached garages with electric power.

(b) For dwelling units, attached garages, and detached garages with electric power, at least one wall switch-controlled lighting outlet shall be installed to provide illumination on the exterior side of outdoor entrances or exits with grade level access. A vehicle door in a garage shall not be considered as an outdoor entrance or exit.

(c) Where one or more lighting outlet(s) are installed for interior stairways, there shall be a wall switch at each floor level, and landing level that includes an entry way, to control the lighting outlet(s) where the stairway between floor levels has six risers or more.

(d) Where lighting outlets are installed as specified in 210.70(A)(2)(a), (b), and (c) above switch control shall be provided at each entrance to these locations.

Substantiation: The original proposal in the ROP should be reconsidered, and accepted.

The Panel Statement in the ROP stated as follows, “The location and number of switches is a design requirement that is determined by the designer, user or installer.”

I must respectfully disagree. If the location and number of switches is in fact a design requirement, then it would seem that the whole of 210.70(A)(2) is in fact moot and should not be included in the NEC. The problem cited in my substantiation in the ROP stems from any number of typical scenarios that can be imagined, but I will cite one from personal experience.

One evening during the summer months I was working in the yard after dinner. At the time my wife was away, and I decided to tackle about an hours
worth of yard work. I locked the house, and exited through the rear door on the first floor while it was still light at about 6:00 PM. Until about 7 PM or so, there is adequate light through my basement windows from outside to see in the basement, so I entered the basement from the outside door - which was open at the time to retrieve my gardening implements. At about 7:00 PM my neighbor engaged me in a hearty conversation and a pleasant snack. Before too long it was nearing 9:00 PM and the daylight was for all intent and purposes gone. Not desiring to stumble through the basement because it was dark, and there was no switch at the rear basement entry door for the interior lights, I went to the first floor rear entrance to enter there. Much to my surprise I found that the door was inadvertently locked upon my exit. I had no other choice but to enter my house except through the dark basement, tripping on an upturned throw rug in the basement.

Had there been a switch at the rear basement entry for the interior lighting in the basement, perhaps my tripping (and bruised knee) could have been prevented. To quote the old adage; “An ounce of prevention is worth a pound of cure.”

I would also take this opportunity to quote from the Commentary following 20.70(A)(2) in the National Electrical Code Handbook NINTH EDITION - Copyright 2002 National Fire Protection Association, Inc., which states in part; “adequate lighting and proper control and location of switching are as essential to the safety of occupants of dwelling units, hotels, motels, and so on, as are proper wiring requirements. Proper illumination ensures safe movement for persons of all ages, thus preventing many accidents.”

Safety in and of itself is in fact a “design requirement” (to borrow a phrase from the Panel Statement in the ROP). Safety should be designed into each installation according to 90.1(B).

In an attempt to have the original proposal reconsidered, I have presented a person's experience to the Panel. The original proposal emanated from the external authors of the industry benchmark National Electrical Code Handbook NINTH EDITION - Copyright 2002 National Fire Protection Association, Inc. I would also call the Panel’s attention to Panel Member Mr. King’s “Explanation of Negative” in the ROP.

In the interest of safety, I respectfully thank you for your important reconsideration of this proposal.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms that location and number of switches is a design requirement and determined by the designer, user, or installer.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
WEBER, R.: The panel should have accepted this comment and the Proposal 2-252 as well. The time has come to provide clear and positive code text and guidance, to the designer and installers as to where switches or controls for lighting outlets are to be located. We often times hear that “it is a design issue” rose as to why there is not definitive direction as to switch or control location. At present, one could place a switch or lighting control in the further corner of a room or space and have the user proceed through a darkened space to turn on the lighting outlet. The panel needs to address an essential safety element for the use of electrical systems to provide switching and proper control locations in the code to ensure the safe movement of persons occupying those spaces. We address illumination requirement for emergency systems in 700.16 and switch locations in 700.21, but do not afford the same level of considerations of everyday use of structures or rooms, as to the need for illumination prior to traveling through that space to find a lighting switch or control. The building codes under the energy conservation requirements will specify type and location of controls for illumination; it should also be identified in the electrical code. 2-242 Log #1681 NEC-P02 Final Action: Accept (210.70(A)(1))

Submitter: Nicholas Thompson, Gregory C. Thompson & Sons

Comment on Proposal No: 2-258
Recommendation: Continue to Reject the proposal.

Substantiation: The code states that “at least one wall switch controlled lighting outlet shall be installed in every habitable room and bathroom. To install all switches and entry to related rooms more controversy over wording and interpretation. The intent of the code is not design, to enforce electricians to install switches in every habitable room at every entrance would not be practical and unneeded. This revision should be rejected because it is purely a desire of design and not something code should cover, for the sake of the inherent difficulty of some instances.

Panel Meeting Action: Accept

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
KING, D.: The control of illumination at the entrance to habitable rooms is a safety issue and not a design consideration as stated by the submitter. Location and accessibility of switches is addressed in other sections of the NEC. Section 210.70(A)(3) requires at least one point of control for illumination of equipment and storage spaces to be at or near the entrance. This is intended to provide control of illumination at a location that will allow for safe access to these spaces. The same level of safety should be required for occupants entering all habitable living spaces within a dwelling. The submitter has also not substantiated that this requirement would not be practical. Panel 2 should give further consideration to this Comment.

WEBER, R.: The panel should have rejected this comment. I do not agree with the submitter’s substantiation statement on “controversy over wording and interpretation”, clearly stated code text and requirements do not seem to be a problem for other parts of the code for the users. The “impracticality” concern is not a valid reason to reject the proposed change as well; if the space can be illuminated prior to entrance, the safety to occupants is enhanced. See my explanation of negative vote on Comment 2-241.

2-242 Log #1014 NEC-P02 Final Action: Reject (210.70(A)(2) Exception No. 2)

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 2-261
Recommendation: Designate the existing exception as Exception No. 1 and add a second exception as follows:

Exemptions No. 2 to (C): Where a stairway connects to an unfinished area with no other entryway, that by virtue of its dimensions or of permanently installed equipment cannot be converted to use as a sleeping area, the switch at the level of the unfinished area shall be permitted to be omitted.

Substantiation: I agree with Mr. Frederick Hartwell that there is little gain from having a switch at the end of a stairway. Moreover, there is an advantage to using DPSSTs, with ON always being the Up position. Even if such a basement or attic has a certain amount of daylighting, the electricity cost associated with leaving the light on while working in such a space is compensated for by the owner’s never having to question whether the light is on or off, versus needing a new light bulb or having an electrical problem.

Panel Meeting Action: Reject

Panel Statement: The panel disagrees with the submittor and notes that the additional switch does serve a purpose for stairwells having six or more treads.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-242 Log #1364 NEC-P02 Final Action: Reject (210.70(A)(2)(c))

Submitter: Eugene Swisher, City of Tampa / Rep. IBEW Local 915 & IAEI Suncoast Division

Comment on Proposal No: 2-262
Recommendation: Revise text to read as follows:

Where one or more lighting outlet(s) are installed for interior stairways, or exterior stairways that provide the sole means of access to the upper level of multilevel, single family residences. There shall be a switch at each floor or grade level that includes an entryway, to control the lighting outlet(s) where the stairway between floor level or grade and access level has six risers or more.

Substantiation: As the original submitter of this proposal, I was attempting to identify and rectify the problem that is inherent to a garage type apartment or mother-in-law suite located above the garage of a single family residence that has a detached structure, for garage and suite. This type of installation is very prevalent in this area and the codes does not dictate safe lighting control in this situation.

Panel Meeting Action: Reject

Panel Statement: The panel does support requiring switches at exterior locations, but this is not prohibited in the code.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:
KING, D.: The submitter of this Comment is correct in stating that the same switching requirements for the interior stairways of a dwelling unit should apply to the exterior stairways of the dwelling unit. The same hazards exist from the absence of control of illumination whether the stairway is located indoors or outdoors. The Panel statement does not properly address the submitter’s recommendation. The Panel needs to clarify in their statement where they do not support requiring switches at exterior locations. Accepting this Comment would provide for the consistent application of section 210.70(A)(2)(C) regardless of the location of the stairway at the dwelling unit and should be given further consideration.

WEBER, R.: The panel should have accepted in principle this comment and the original Proposal 2-262. The panel statement in the proposal phase is correct for the last sentence regarding multi-family applications, but the use of other control means could be allowed to make sure the user is not forced to utilize the stairway in darkness. Building codes mandate level of illumination on stairway areas, and the NEC should indicate where switches or lighting controls should be located at. The portion of the panel statement that indicates “but this is not prohibited in the code” is true, but we are once again back to the concept of the minimum requirement to pass inspection then becomes the maximum of what is normally done and no more beyond that point is provided to address a safety issue.

ARTICLE 215 — FEEDERS

2.245 Log #1757 NEC-P02  Final Action: Reject
(215.2)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 2-275
Recommendation: Add the word “of” before the words “not less than” in the first and second sentence and add a hyphen in the word “non-continuous.” To read as follows:

215.2 Minimum Rating and Size.
(A) Feeders Not More Than 600 Volts.
(1) General. Feeder conductors shall have an ampacity of not less than required to supply the load as calculated in Parts III, IV, and V of Article 220. Feeder-circuit conductors that are connected to an overcurrent device assembly shall have a minimum allowable ampacity, before the application of any adjustment or correction factors, if not less than the non-continuous load plus 125 percent of the continuous load.

Substantiation: Corrections are for editorial purposes only.

Panel Meeting Action: Reject
Panel Statement: The submitter’s revision does not add any clarity to the code.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-246 Log #442 NEC-P02  Final Action: Reject
(215.2(A)(1))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 2-274
Recommendation: Accept proposal.

Substantiation: Please refer to proposal substantiation which postulated a feeder protected at 800 amperes with a grounded conductor load of 3 amperes which requires a 1/0 cu. or 3/0 al grounded conductor. Consider the same installation supplied by service conductors instead of a feeder. If the grounding electrode is a driven rod or concrete encased electrode the GEC can be a 6 AWG or 4 AWG. 230.42(C) permits the grounded conductor to be the minimum size permitted by 250.24(C)(1), not smaller than the GEC required in Table 250.66, modified by 250.66(A)(B) to permit a 6 AWG or 4 AWG where the 12-1/2 percent requirement of 250.24(C)(1) does not require a larger size. It is hard to understand why a service grounded conductor can be smaller than a feeder grounded conductor which has overcurrent protection where the load and conductors are the same. A 3-phase 3-wire feeder from a corner grounded transformer supplying a motor(s) may have overcurrent protection higher than the feeder ampacity and this rule could require the grounded conductor to be larger than the ungrounded conductors. There is no provision similar to 250.122(A) that limits the size. This section does not allow for reduced size tap conductors. It is faulty in that it doesn’t address grounded conductors of other feeders or branch circuits installed in the same raceway where the conductor sizes and overcurrent protection may vary. If the largest feeder requires a 3/0 grounded conductor, does this size apply to other circuit grounded conductors in the same raceway regardless of the circuit rating?

Panel Meeting Action: Reject
Panel Statement: The panel was unable to establish the submitter’s intent.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-247 Log #443 NEC-P02  Final Action: Reject
(215.2(A)(1))

Panel Meeting Action: Reject
Panel Statement: The panel was unable to establish the submitter’s intent.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-248 Log #1013 NEC-P02  Final Action: Reject
(215.3(A)(3), FPN 2)

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 2-278
Recommendation: Revise text to read as follows:
...and where the maximum total voltage drop from nominal voltage on feeders and branch circuits to the farthest outlet...

Substantiation: While the Panel Statement says, “It is not necessary to define possible combinations of equipment to convey the intent of the FPN,” its present wording specifies one single combination of equipment. This implies to many that they need not be concerned about the voltage reaching equipment so long as these two sources of impedance are addressed. I have had multiple conversations that demonstrated this. While FPNs are advisory, not mandatory, they constitute a de facto standard of good practice, relied on by specifiers, lawyers, and others. Deleting the two examples removes the misleading element. Adding language such as “from the sum of all upstream impedances” might emphasize the point, but may be gratuitous. Parsimonious language often is preferable—one reason I have no issue with the CMP’s mixing my initial proposals addition of other sources. The reason that I suggest the additional wording, “from nominal voltage” is that the FPN is advising about proper operation of utilization equipment. This is effected not by what VT testers report-the drop from initially supplied voltage, in response to a simulated load-but by voltage significantly lower than its design voltage. Electricians and other users of the NEC have only partial control over this, but certainly more control than “feeders and branch circuits” implies.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree that the recommendation adds any clarity to the section. The text refers to feeders and branch circuits as they apply to Articles 210 and 215. Voltage drop is a design issue.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-249 Log #2248 NEC-P02  Final Action: Reject
(215.4)

Submitter: Donald A. Ganiere, Ottawa, IL
Comment on Proposal No: 2-280
Recommendation: This proposal should be accepted.

Substantiation: There is no prohibition on the use of a common neutral for multiple circuits to be found anywhere in the NEC. The use of the wording “shall be permitted” in 215.4 does not act as a prohibition on the use of common neutrals for other circuits. It is only a permission to use them in specific cases, however this permission does not prohibit the use of common neutrals in other cases. The NEC Manual of Style (3.1.2) says that the words “shall be permitted” in 215.4 does not act as a prohibition on the use of common neutrals, the existing wording in 215.4(A) has no meaning and should be changed.

Panel Meeting Action: Reject
Panel Statement: The panel disagrees with the submitter’s statement that there is no limit regarding the numbers of feeders that can be run together, and clarifies the limits using revised wording. See the action and statement on Panel Comment 2-249a (Log #201).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-249a Log #CC201 NEC-P02  Final Action: Accept
(215.4(A))

Submitter: Code-Making Panel 2,
Comment on Proposal No: 2-281
Recommendation: Revise 215.4(A) to read as follows:
“215.4 (A) Feeders with Common Neutral. Up to three sets of 3-wire feeders or two sets of 4-wire or 5-wire feeders shall be permitted to utilize a common neutral.”

Substantiation: The revised texts adds clarity in that it better defines the limits of feeders to be run with a common neutral.

Panel Meeting Action: Accept
Panel Statement: The revised texts adds clarity in that it better defines the limits of feeders to be run with a common neutral.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

70-97
2-250 Log #24 NEC-P02  Final Action: Accept (215.6)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 2-283
Recommendation: It was the action of the Technical Correlating Committee that the panel reconsider this Proposal and correlate with the action taken on Proposal 5-119. This action will be considered by the panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Reserve the text from the Proposal to read as follows:

"215.6 Feeder Equipment Grounding Conductor. Where a feeder supplies proposals. power system are balanced enough to permit the sensitivity described in the distributed phase capacitances on an actual installed three-phase 480 volt circuit is disconnected..." There are numerous instances where unqualified and commercialized.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Reserve the text from the Proposal to read as follows:

Where the premises wiring system has feeders supplied from more than one nominal voltage system with different characteristics such as voltage, frequency, phases, Ac or dc, or supplied from different services or separately derived systems, each ungrounded conductor of a feeder where accessible shall be identified by system at all terminations, connections, and supply points. The means of identification shall be permitted to be by different color coding, marking tape, or other approved means. The means of identification shall be posted at the point where the feeder receives its supply.

Exception No. 2: Conductors for emergency systems.
Exception No. 3: The enclosures for busway conductors shall be identified in an approved manner.
Exception No. 4: Associated control and signal conductors installed in the same raceway, cable or enclosure with the feeder conductors.
Exception No. 5: Where the authority having jurisdiction determines that a system is sufficiently limited or separated from other systems, identification shall not be required.

Substantiation: This section only applies to different voltage systems interconnection or misconnection of conductors with differences other than voltage, such as ac and dc, frequencies, grounded and ungrounded, separately derived, can be hazardous mixtures of such systems with the same voltage may be in the same raceway, enclosure or cable tray, which merit identification. The proposed exceptions are covered elsewhere or proposed for practicality.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 2-17.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-251 Log #1878 NEC-P02  Final Action: Accept in Principle (215.6)

Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 2-283
Recommendation: Continue to accept the proposal with the following change: 215.6 Feeder Conductor Equipment Grounding Conductor Means. Where a feeder supplies branch circuits in which equipment grounding conductors are required, the feeder shall include or provide an equipment grounding conductor a ground means, in accordance with the provisions of 250.14, to which the equipment grounding conductors of the branch circuits shall be connected.

Exception: Where the feeder to a separate building or structure is installed in accordance with 250.32(B)(1) Exception, an equipment grounding conductor shall not be installed.

Substantiation: This comment is simply a correlation with the accepted Proposal 5-119. The accepted proposal to 215.6 should have the reference changed from 250.32(B)(2) to 250.32(B)(1) Exception. This proposal should only be accepted if 5-119 continues to be accepted.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 2-250.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-252 Log #1888 NEC-P02  Final Action: Reject (215.9(A) and (B))

Submitter: Paul S. Hamer, Richmond, CA
Comment on Proposal No: 2-285
Recommendation: This proposal (and its companion Proposals 2-6, 2-88, 11-48 and 11-49 - Comments submitted separately) should be accepted. Add to the end of the proposal wording: This requirement shall become effective January 1, 2011. This aligns with Mr. Weber’s Explanation of Negative for Proposal 2-88 regarding the development of new, life-saving concepts. The Proposal wording, and its included phrase “shall be permitted,” is important to the end of the proposed wording:

Clause 2-285 Log #1888 NEC-P02

Exception: Where the authority having jurisdiction determines that a system is sufficiently limited or separated from other systems, identification shall not be required.

Substantiation: This section only applies to different voltage systems interconnection or misconnection of conductors with differences other than voltage, such as ac and dc, frequencies, grounded and ungrounded, separately derived, can be hazardous mixtures of such systems with the same voltage may be in the same raceway, enclosure or cable tray, which merit identification. The proposed exceptions are covered elsewhere or proposed for practicality.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 2-17.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-253 Log #405 NEC-P02  Final Action: Reject (215.12(C))

Submitter: Daniel Leaf, Seneca, SC
Comment on Proposal No: 2-294
Recommendation: Accept proposal revised:

Where the premises wiring system has feeders supplied from more than one nominal voltage system with different characteristics such as voltage, frequency, phases, Ac or dc, or supplied from different services or separately derived systems, each ungrounded conductor of a feeder where accessible shall be identified by system at all terminations, connections, and supply points. The means of identification shall be permitted to be by different color coding, marking tape, or other approved means. The means of identification shall be posted at the point where the feeder receives its supply.

Exception No. 1: Conductors for fire alarm circuits.

Exception No. 2: Conductors for emergency systems.

Exception No. 3: The enclosures for busway conductors shall be identified in an approved manner.

Exception No. 4: Associated control and signal conductors installed in the same raceway, cable or enclosure with the feeder conductors.

Exception No. 5: Where the authority having jurisdiction determines that a system is sufficiently limited or separated from other systems, identification shall not be required.

Substantiation: This section only applies to different voltage systems interconnection or misconnection of conductors with differences other than voltage, such as ac and dc, frequencies, grounded and ungrounded, separately derived, can be hazardous mixtures of such systems with the same voltage may be in the same raceway, enclosure or cable tray, which merit identification. The proposed exceptions are covered elsewhere or proposed for practicality.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 2-17.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-254 Log #1898 NEC-P02  Final Action: Accept in Principle (215.12(C))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 2-292
Recommendation: I. Rephrase the additional text as “phase or line and”. II. Split the second sentence into two sentences, revised to read as follows: The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means. The method utilized for conductors originating within each feeder panelboard or similar feeder distribution equipment shall be permanently posted on the equipment.

Substantiation: I. The rule will also apply to single-phase distributions, where both ungrounded conductors are of the same phase but with a potential difference between them. The panel action incorrectly implies that these conductors are of differing phases, which is not the case. This wording makes the rule technically correct.

II. At every seminar I give on the 2005 NEC, someone or usually more than one, asks whether the panelboard labeling rule covers the conductors originating at that panel, or whether the rule is a reciprocal rule requiring every panel to list every identification scheme for every system in the building. The words in the NEC will support both interpretations. When I raised this at the Eastern Section IAEI meeting, the speakers had no idea either, and suggested I address it with a comment. This wording supposes the intent is the former; if I guessed wrong, then please put contrary wording in the book. It does seem that when you get a number of systems you would need a huge amount of real estate to list all the options, so I hope I guessed correctly.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the submitter’s revision to change “phase and” to “phase or line and”.

Revise the last sentence of 215.12(C) of the ROP text to read as follows: “The method utilized for conductors originating within each feeder panelboard or similar feeder distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each feeder panelboard or similar feeder distribution equipment.”
Panel Statement: The panel has accepted the addition of the words that apply to phase or line conductors. The panel agrees with the intent of the submitter that the identification is required to identify the conductors that originate at that panelboard. To accomplish that intent, the panel has revised the words from the ROP to state that the identification (whether documentation or posting) be for the conductors at that panelboard.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

ARTICLE 220 — BRANCH-CIRCUIT, FEEDER, SERVICE CALCULATIONS

2-255 Log #1310 NEC-P02 (220.10) Final Action: Reject

Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 2-300
Recommendation: None.
Substantiation: I can agree with the CMP in that current requirements of 220.10 are not in conflict with energy codes. They provide for values that are significantly larger for lighting than energy codes allow. This as the panel response indicates requires services and feeders that will provide more than adequate capacity. My question would be why should we provide adequate capacity for something we cannot use?
Panel Meeting Action: Reject
Panel Statement: No specific recommendation has been made. The comment does not comply with Section 4.3.3(c) of the Regulations Governing Committee Projects.

2-256 Log #594 NEC-P02 (220.14(k)(1)) Final Action: Accept

Comment on Proposal No: 2-305
Recommendation: We support the panel’s action.
Substantiation: None given.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-257 Log #1202 NEC-P02 (220.14(k)(1)) Final Action: Accept

Submitter: James W. Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 2-305
Recommendation: We support the panel’s action in Accepting this Proposal as written.
Substantiation: None.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-258 Log #1311 NEC-P02 (220.20) Final Action: Reject

Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 2-307
Recommendation: I can agree with the CMP in that current requirements of 220.40 are not in conflict with energy codes. They provide for values that are significantly larger for lighting than energy codes allow. This, as the panel response indicates, requires services and feeders that will provide more than adequate capacity. My question would be why should we provide adequate capacity for something we cannot use?
Substantiation: As an example: A major retailer routinely specifies a 4000 Ampere service for their identical facilities when by historical data the need does not exceed 1200 Amperes for operation. They have reduced the service size to 3000 amperes which provides more than adequate amperage.
Panel Meeting Action: Reject
Panel Statement: No specific recommendation has been made. The comment does not comply with Section 4.3.3(c) of the NFPA Regulations Governing Committee Projects.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-259 Log #2227 NEC-P02 (220.50) Final Action: Reject

Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 2-329
Recommendation: This Proposal should be Accepted, changed as follows: 220.50 Motors. Motor loads shall be calculated in accordance with 430.24, 430.25, and 430.26 and with 440.31, 440.32, 440.33, 440.34, and 440.35 for hermetic refrigerant motor compressors.
Substantiation: This section is intended to clarify whether the A/C is to be calculated at 100 percent or 125 percent. It also refers the code user to more prescise sections of Article 440, similar to the references to Article 430 in this section.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree that adding references to 440.31, 440.32, 440.33, and 440.35 would provide clarity for determining motor loads. In addition, 440.6 should remain, as it addresses motor ratings.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-260 Log #2135 NEC-P02 (220.51, FPN (New)) Final Action: Reject

Submitter: Sheldon Monson, Wadena, MN
Comment on Proposal No: 2-314
Recommendation: Add a Fine Print Note: The purpose of this section is for the laundry branch circuit covers 120-volt dryers.
Substantiation: The submitter’s proposed FPN does not add any clarity to the intent in 220.5. In addition, fine print notes should not be written in mandatory language.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-261 Log #537 NEC-P02 (220.54) Final Action: Reject

Submitter: Dan Leaf. Seneca, SC
Comment on Proposal No: 2-324
Recommendation: Accept in Part: “208-volt and 240-volt”.
Substantiation: The requirement should specifically apply only to such dryers. The laundry branch circuit covers 120-volt dryers.
Panel Meeting Action: Reject
Panel Statement: Section 220.54 addresses the loads assigned to electric clothes dryers regardless of voltage.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-262 Log #1756 NEC-P02 (220.54) Final Action: Accept

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 2-325
Recommendation: Change “under this section” in the last sentence to “in this section” as follows:
220.54 Electric Clothes Dryers — Dwelling Unit(s). The load for household electric clothes dryers in a dwelling unit(s) shall be either 5000 watts (volt-amperes) or the nameplate rating, whichever is larger, for each dryer served. The use of the demand factors in Table 220.54 shall be permitted. Where two or more single-phase dryers are supplied by a 3-phase, 4-wire feeder or service, the total load shall be calculated on the basis of twice the maximum number connected between any two phases. Kilovolt-amperes (kVA) shall be considered equivalent to kilowatts (kW) for loads calculated in under this section.
Substantiation: This change is editorial since the calculation is “in this section” not “under this section.”
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
2-263 Log #848 NEC-P02 (Table 220.55) Final Action: Reject

**Submitter:** John P. Masarick, Independent Electrical Contractors Inc.

**Comment on Proposal No:** 2-326

**Recommendation:** The panel is encouraged to continue to Reject Proposal 2-326.

**Substantiation:** The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

**Panel Meeting Action:** Reject

**Panel Statement:** The panel notes that Proposal 2-326 was accepted. The substantiation does not support the comment. The comment does not comply with 4.3.3(c) of the Regulations Governing Committee Projects.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

2-270 Log #1803 NEC-P02 (220.89) Final Action: Reject

**Submitter:** Michael Walls, American Chemistry Council

**Comment on Proposal No:** 2-336

**Recommendation:** Add text to read as follows:

(A) Applicability - New petroleum and chemical processing plants must comply with the following criteria in order to apply the optional calculations permitted in 220.89 in lieu of part 1H of this article.

(1) Exist for the primary purpose of manufacturing, refining and/or processing petroleum and chemical products.

(2) Qualify as a plant within a Supervised Industrial Installation as defined in article 240.2.

**Panel Meeting Action:** Reject
(3) Have measured demand data obtained in accordance with article 220.87.
(1) from at least two existing petroleum or chemical processing plants using similar process technology in the manufacture of the same product(s).

(B) Demand Factor - For services and feeders in Petroleum and Chemical Processing Plants. The demand factor shall be permitted to be the product of the total connected load and a demand factor. The applied demand factor shall meet the following requirements:
(1) Be calculated and applied under engineering supervision.
(2) Yield a demand factor capable of serving the actual operating load.
(3) Not be less than 50% of the connected load.
(4) Not be less than 125% times the highest maximum demand determined for two similar plants as measured per article 220.87(1).

Substantiation: The alternate proposed text offered in B. Nenninger’s Explanation of the Negative Proposal should be accepted. (See Code Text Above) The NEC does not specifically recognize the use of demand factors in the determination of loads in industrial installations. As a result, the NEC determined loads for these installations are overly conservative and require distribution systems with higher than needed ratings at a significant cost to owner. However, the approach is inconsistent with the historical experience found in both utilities and industry. Utilities have been successfully sizing and operating supplies using a demand-based approach for many years. Industry has also had success applying a demand-based approach in calculating loads when allowed by the authority having jurisdiction. The NEC recognizes this as an issue and partially addresses it in Article 220 by allowing sixteen optional methods that make use of demand factors for determining particular types of loads. However, none of these optional methods address industrial installations. The proposed text is considerably more restrictive than past remedy’s, focusing specifically on petroleum and chemical process facilities by referencing specific provisions for this industry segment. Additionally, the requirement that the petroleum or chemical plant qualify as being within a Supervised Industrial Installation per article 240.2 ensures only qualified persons monitor and service the system and that the plant is part of an overall system load exceeding 2500 kVA. Finally, the use of measured maximum demand data per article 220.87 for two comparable plants in operation establishes a minimum demand based on actual data. In the case of the petroleum and chemical industry, it is difficult to gather comparable “one size fits all” load data as was done for the restaurant calculations. In order to achieve a similar approach, one would need to gather extensive data sets around a long list of specific process technologies such as Polyethylene, Chlor-alkali, Polycarbonate, Ethylene, etc. Even then, the core technologies used in these segments evolve impacting demand profiles.

Panel Meeting Action: Rejected
Panel Statement: The panel believes that the submitter has taken the correct approach to narrow this comment to a specific industry segment, and requests that data be provided to compare the NEC calculated loading to the actual loading in the facilities. In addition, there is nothing in the present Code that would prohibit the user from working with the authority having jurisdiction to obtain special permission to utilize alternative calculation methods.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: NENNINGER, B.: The optional demand calculation offered for “New Petroleum and Chemical Plants” should have been accepted for the reasons already articulated in the various proposals/comments submitted. However, the panel’s request for data better substantiating the proposal is understandable. It is encouraging to note the panel’s willingness to reconsider the issue if concerns raised are substantiated with industry data. The issue should be revisited in the 2011 cycle given a successful effort to collect actual operating demand vs. NEC calculated demand for an assortment of industrial installations.

Submitter: Timothy M. Croushore, Allegheny Power
Comment on Proposal No: 2-357
Recommendation: Please accept the proposed text as shown in Mr. Purvis’ negativity as published on page 70-133 of the ROP.
Substantiation: The substantiation of the proposal is addressing essentially the same issues for commercial occupancies as also identified in Proposal 2-356 for industrial occupancies. The same exact load characteristic issue is addressed in ANSI/IEEE Std. 241 Recommended Practice for Electric Power Systems in Commercial buildings. Chapter 2. I agree with the substantiation of Dorothy Kellogg of the American Chemistry Council. I also agree with Mr. Purvis that this optional method should not apply to one- and two-family dwellings.

The proposed text by Mr. Purvis of Proposal 2-357 is much cleaner and can be applied to both commercial and industrial occupancies rather than just industrial occupancies as requested in Proposal 2-356. For chain commercial occupancies as indicated in the original proposal, actual metered electric loads are much more available by the electric utility industry and discussed as a valid method in the ANSI/IEEE 241 Std. The NEC recognizes or permits engineering judgment, evaluation, or supervision for the following requirements:

- Amperage calculation in 310.15(C)
- Electrical enclosures in 110.70 and 110.71
- Branch circuits over 600 volts in 210.19(B)(2)
- Minimum size and rating of feeders over 600 Volts in 215.2(B)
- Overcurrent protection of Part II of Article 240
- Series Rating of overcurrent protection in 240.86
- Short-circuit and ground fault protection in 240.92 and 240.100
- Neutral Ampacity and size of neutral conductors in 250.18(A)(2) and 310.4

Exception No. 4: Amperage of conductors rated 2001 to 35,000 volts in 310.60(B) and (D)

The engineering judgment, evaluation, and supervision concept that is currently in the National Electrical Code does establish a minimum level of safety while providing flexibility for design criteria of the actual installation. The National Electrical Code already permits the engineer to calculate conductor amperage and overcurrent protection for non-commercial occupancies such as mentioned in the above sections. It is reasonable to allow the qualified professional engineer to calculate the actual load for such a facility as an optional method of load calculation.

Panel Meeting Action: Rejected
Panel Statement: The panel is not willing to accept an open-ended approach to load calculations. Article 220 contains the minimum requirements for calculations.

For additional information, see the panel action and statement on Comment 2-270

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: PURVIS, R.: Comment 2-271 on Proposal 2-357 should be accepted. EEI disagrees that this is an open ended approach for calculating the feeder and service load. Rather it would make load calculation more nearly match the transformer size of the serving utility rather than be oversized based on present Article 220 load calculations. Acceptance of this comment would also include both commercial and industrial calculations as well as meeting the intent of Comment 2-270 on Proposal 2-356 for a new Section 220.89.

ARTICLE 225 — OUTSIDE BRANCH CIRCUITS AND FEEDERS

4-3 Log #1085 NEC-P04 Final Action: Reject
(225.1, FPN )

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 4-5
Recommendation: Accept the Proposal.
Substantiation: The submitter is correct. The FPN does add confusion when one considers that the NEC is an enforcement document that is adopted by practically all jurisdictions throughout the US.

The NEC does indeed contain provisions that are in conflict with the NEC. Should users decide to utilize the NESC for installations covered by the NEC, the conflicts place the AHJ in a very difficult position. Although the NESC may be useful for some engineering design information, its reference as a source from the NEC implies that it is capable of being used without interfering with the use of the NEC. The code loses nothing by deleting the reference, but has increased confusion/conflict with the reference included.

Panel Meeting Action: Rejected
Panel Statement: See panel action and statement on Comment 4-4.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative: ROGERS, J.: This issue is one of great relevance to the electrical profession. The panel chair has appointed a task group to look at this issue and make recommendations to the TCC for the 2011 NEC cycle. These recommendations may include just those areas covered by CMP 4 and/or the recommendation to create a larger task group to review implications of NESC requirements throughout the NEC. Those that took the time to express their concerns relative to this issue in both the proposal and the comment stages should be commended as it is my opinion that these issues need to be addressed.
Wiring on Buildings. The installation of grounded circuit conductors should be covered or insulated.

DEATON, R.: Grounded circuit conductors should be covered or insulated.

Comment on Proposal No: 4-5

Recommendation: Delete this FPN completely.

Substantiation: The panel statement indicates the FPN provides Code users with more information on high voltage installations. If that information is needed by designers and installers to make proper and safe installations, it should be included as mandatory text, not an informational FPN. As an AHJ with a significant number of installations that utilize systems greater than 600-volts, I can confirm the FPN currently adds to the confusion for requirements on installations above 600-volts. If adoption of two standards is required or needed for governmental bodies to regulate the installations, it seems the NEC should remove those installations from it’s scope and remove the uncertainty of responsibility for these installations. If the NEC continues to claim responsibility for the installations, a complete set of requirements should be established and references to another document in FPN’s should be removed. In the enforcement of the NEC, the NESC references to the NEC cause regular debate and challenge from designers that attempt to use the NEC for pole line distribution on the secondary of the service point. The purpose for this proposal and comment is not to change the requirements that govern the installations, but to clarify which code or standard is responsible for installations on the customer side of the service point. Confusion can not enhance safety. See CMP-1 action on Proposal 1-145.

Panel Meeting Action: Reject

Panel Statement: The original submitter and the commenter both raise legitimate issues relative to the functionality of the FPN. Even though there is no mandatory requirement, the reference to the NESC would provide further assistance where there are no specific NEC requirements. The purpose of this fine print note is to point out that more information on high-voltage installations is available by accessing the National Electrical Safety Code, which is sometimes adopted by government regulatory authorities.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative:

ROGERS, J.: See my comment on Comment 4-3.

4-5 Log #1680 NEC-P04

Final Action: Reject
(225.4 Exception)

Submitter: Donald W. Zipse, Electrical Forensics, LLC

Comment on Proposal No: 4-6

Recommendation: Delete the following words from Section 225.4, Exception, “and grounded circuit conductors”.

Substantiation: This proposal needs to be reconsidered in light of the acceptance of Code Making Panel No. 7 to stay with their decision to make the messenger a non-current carrying support cable.

Panel Meeting Action: Reject

Panel Statement: This exception is necessary, since it recognizes that an uninsulated grounded conductor is permitted to be buried under the ground or articles of the NEC. For example, Article 396 permits messenger-supported wiring to have an uninsulated or covered messenger wire to support insulated conductors. Another example of a wiring method permitting an uninsulated grounded conductor is found in 338.10(B)(2) Exception covering service entrance cable (Type SE or USE cable) where the grounded conductor is covered within the overall jacket of the cable but would not be considered as insulated. The grounded conductor is permitted by 250.32(B)(2) to be installed from one building or structure to another building or structure without the use of an equipment grounding conductor under certain considerations, with 396.10(A) permitting SE or USE cable to be used as messenger-supported wire. Millions of miles of overhead cables with uninsulated grounded conductors as messenger cables for service drops are installed by the utility companies without problems.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Negative: 1
Explanation of Negative:

DEATON, R.: Grounded circuit conductors should be covered or insulated.

4-6 Log #1015 NEC-P04

Final Action: Accept
(225.10)

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 4-10

Recommendation: Revise text to read as follows:

225.10 Wiring on Buildings. The installation off of outside wiring

Substantiation: Typo.

Panel Meeting Action: Accept

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-7 Log #1216 NEC-P04

Final Action: Accept
(225.18, 230.24(B), and 230.50)

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 4-4

Recommendation: The NEC TCC Grounding and Bonding Task Group recommends that CMP-4 continue to Accept in Principle for Sections 225.18, 230.24(B), and 230.50.

Substantiation: The NEC TCC Grounding and Bonding Task Group concurs with CMP-4 Panel Action to accept in principle for Sections 225.18, 230.24(B) and 230.50 based on CMP-4’s Panel actions on Proposals 4-12 and 4-40 to remove the word “ground” describing clearances.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-8 Log #1312 NEC-P04

Final Action: Hold
(225.18(5) (New))

Submitter: Joseph A. Hertel, Safety and Buildings

Comment on Proposal No: 4-12

Recommendation: Add the following to 225.18 Clearance from Grade: “(5) 7.5 m (24.5 ft) - over track rails of railroads.”

Substantiation: There is currently no specified height for these conductors above a railroad. We have many industrial facilities where rail is used throughout the facility and the conductors are owned and maintained by the facility. The height requirements are from tables found in ANSI C2, National Electrical Safety Code, which we have used since there is no mention in the NEC.

Panel Meeting Action: Hold

Panel Statement: The comment offers new material that has not had public review and is being held for processing as a proposal for the next revision cycle in accordance with 4.4.6.2.2 of the Regulations Governing Committee Projects.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-9 Log #490 NEC-P04

Final Action: Reject
(225.22)

Submitter: Timothy P. McNeive, Thomas & Betts Corporation

Comment on Proposal No: 4-14

Recommendation: Change the panel action to Accept in Part. Revise 225.22 as follows:

225.22 Raceways on Exterior Surfaces of Buildings or Other Structures. Raceways on exteriors of buildings or other structures shall be arranged to drain and shall be raintight suitable for use in wet locations.

Exception: Flexible metal conduit, where permitted in 348.12(1), shall not be required to be raintight suitable for use in wet locations.

Substantiation: Product standards for “raceways” do not include tests for resistance to moisture ingress. This is because the appropriate NEC Article for each raceway deems the particular raceway suitable, or not, for use in “wet locations” by its intrinsic construction and the availability of fittings also listed for use in “wet locations”. With respect to fittings used with raceways in services and elsewhere, the word “raintight” has either already been removed in favor of a reference to the requirement in 314.15(A), or proposals are being considered in the appropriate Articles.

The Technical Correlating Committee should consider the action by several Code-Making Panels during the 2005 and 2008 NEC cycles where the word “raintight” has been, or will be replaced by “wet location.”

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comments 4-10 and 4-11. Panel 8 has accepted Proposals 8-26, 8-27, and 8-28 to delete the use of FMC in a wet location per 348.12(1), so Panel 4 has accepted Comments 4-10 and 4-11 to delete 225.22 Exception.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
4-10 Log #1848 NEC-P04  Final Action: Accept  
(225.22)

Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 4-14
Recommendation: Accept the Proposal as submitted.
Substantiation: With the acceptance of Proposal 8-27, this proposal should be accepted for the sake of consistency.
Panel Meeting Action: Accept
Panel Statement: The submitter is correct that this exception is not necessary. Should flexible metal conduit be permitted to be installed in a particular location, the requirements found in Article 348 and the manufacturer’s instructions will define the installation method. In addition, CMP 6 has accepted a change for the 2008 NEC that will prohibit installing flexible metal conduit in wet locations.
Number Eligible to Vote: 10
Ballet Results: Affirmative: 10

4-11 Log #2152 NEC-P04  Final Action: Accept  
(225.22)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 4-14
Recommendation: Panel 4 should reverse their action on Proposal 4-14 and should “Accept” this Proposal.
Substantiation: Panel 8 has the jurisdiction to determine which conduits are acceptable for “Wet Locations”. Panel 8 “Accepted” Proposals 8-26, 8-27, and 8-28 to delete the use of FMC in a wet location per 248.12(1). The Exception found in 225.22 would only reference a “Uses Not Permitted” and would not change the rule.
The Technical Correlating Committee (TCC) should have addressed this proposal in their review. Also, see Panel Action on Proposal 4-58.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballet Results: Affirmative: 10

4-12 Log #596 NEC-P04  Final Action: Hold  
(225.30)

Comment on Proposal No: 4-16
Recommendation: The Panel should have Accepted in Principle. We suggest the addition of a new second paragraph to read as follows:

“Where a branch circuit or feeder originates in these additional buildings or other structures, only one feeder circuit shall be permitted to supply power back to the original building or structure, unless permitted in 225.30(A) through (E).”

Insert it between the existing first sentence and the last sentence. Making the existing sentence into a separate third paragraph. The new text to read as follows:

225.30 Number of Supplies. Where more than one building or other structure is on the same property and under single management, each additional building or other structure that is served by a branch circuit or feeder on the load side of the service disconnecting means shall be supplied by only one feeder or branch circuit unless permitted in 225.30(A) through (E).

Recommendation:

Where a branch circuit or feeder originates in these additional buildings or other structures, only one feeder or branch circuit shall be permitted to supply power back to the original building or structure, unless permitted in 225.30(A) through (E). Where a branch circuit or feeder originates in these additional buildings or other structures, only one feeder or branch circuit shall be permitted to supply power back to the original building or structure, unless permitted in 225.30(A) through (E). Where a branch circuit or feeder originates in these additional buildings or other structures, only one feeder or branch circuit shall be permitted to supply power back to the original building or structure, unless permitted in 225.30(A) through (E).

Panel Meeting Action: Hold
Panel Statement: The submitter has not provided any new substantiation to supply an additional building or structure where there is more than one building on the same property and under single management. The text does not address bringing more than one feeder or branch circuit from one of these peripheral buildings back to the original building. The present text would permit an unlimited number of feeders or branch circuits to be brought back to the original building.
For example, a generator could provide power for an emergency branch circuit panel in building No. 2 and any number of branch circuits could be fed from that emergency panel back to the original building to supply any number of emergency loads. The same would hold true for a feeder distribution panel.
Panel Meeting Action: Hold
Panel Statement: The panel action on this comment is to hold. The action on Proposal 4-16 is not affected by this action.
Panel Statement: The comment offers new material that has not had public review and is being held for processing as a proposal for the next revision cycle in accordance with 4.4.6.2.2 of the Regulations Governing Committee Projects.
Number Eligible to Vote: 10
Ballet Results: Affirmative: 10

4-14 Log #505 NEC-P04  Final Action: Reject  
(225.34(B))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 4-21
Recommendation: Accept the proposal.
Substantiation: Same as proposal. Note that the panel comment, third sentence, agrees the disconnects must be located sufficiently remote from ANY other system disconnects which is the thrust of the proposal.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any new substantiation to address the panel’s concerns as stated in the panel statement in the proposal. The present Code wording is clear.
Number Eligible to Vote: 10
Ballet Results: Affirmative: 10
Comment on Affirmative:

ROGERS, J.: I voted with the panel on this comment, however, the submitter is correct in his concern about this item. I would encourage the submitter to resubmit his concerns in a proposal to the 2011 NEC. The proliferations of onsite power production systems and the location of disconnecting means for these systems need to be reviewed. There is merit in separating these disconnects from those disconnects that may be installed for emergency and/or essential electrical systems in the buildings. Should there be a catastrophic failure in the disconnect for one of these onsite systems, there should be some assurance that the emergency supply disconnect is not compromised by this failure.
ARTICLE 230 — SERVICES

4-15 Log #412 NEC-P04 Final Action: Reject (225.39)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 4-22
Recommendation: Accept proposal for (A) and (B).
Substantiation: If a 15-ampere circuit originating in one building supplies an overcurrent device (for example a 5 ampere fuse for motor, the 15 ampere circuit is a feeder, per definition and the 15 ampere minimum should apply. The literal wording in (B) requires one 2-wire circuit to have a disconnecting means rated not less than 30 amperes. Since “one” is “not more than two.” An installation consisting of two 15 ampere multiwire circuits, or two 3-phase 15 amperes or less branch circuits is required by (D) to have a disconnect rated not less than 60 amperes although a 30 ampere rating is sufficient. Proposal did not advocate deletion of (C) and (D). Two 2-wire branch circuits (which may be 15 amperes or less) should only require a feeder disconnect means not less than 30 amperes if the feeder is 2-wire. A 15 ampere feeder disconnect rating is sufficient for a 3-wire feeder supplying two 15 ampere 2-wire branch circuits.
Panel Meeting Action: Reject
Panel Statement: In the first example given in the comment substantiation, the 15 amp circuit breaker supplying the motor with a 5 amp fuse, as additional protection for the motor, would still be a single branch circuit and not a feeder. The purpose of 225.39(A) through (D) is to provide a minimum rating for feeder or branch circuit disconnecting means to ensure the disconnecting means ability to carry the loads. The submitter has not provided any technical substantiation that a problem exists with the existing text or that the present minimum rating for feeder and branch circuit disconnects is causing a problem.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-16 Log #329 NEC-P04 Final Action: Accept (Figure 230.1)

Submitter: Joe Tedesco, Boston, MA
Comment on Proposal No: 5-61
Recommendation: Change “Grounding” to “Grounding and Bonding”
Substantiation: To reflect the change in the title of Article 250 made in the 2005 edition.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-17 Log #1217 NEC-P04 Final Action: Accept (230.7 Exception No. 1)

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 4-4
Recommendation: The NEC TCC Grounding and Bonding Task Group agrees with CMP-4’s Panel action to reject the proposed changes to 230.7 Exception No.1 in Proposal 4-4.
Substantiation: The NEC TCC Grounding and Bonding Task Group concurs with CMP-4 that the existing text in the 2005 NEC is adequate for 230.7 Exception No.1. This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Bokserner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrosky; and Neil F. LaBrake, Jr.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-18 Log #2278 NEC-P04 Final Action: Reject (230.24 Exception No. 5 (New ))

Submitter: Joseph Watson, Watson Electrical & Mechanical Corp.
Comment on Proposal No: 4-38
Recommendation: Revise to read:
Exception No. 5: Where voltage between conductors does not exceed 300, and there is no permanent access to roof, a reduction in clearance to 6 ft shall be permitted.
Substantiation: An 8 ft clearance above the roof places the NEC and the NESC in direct contradiction to each other. When an installation complies with one, it is in violation of the other. The 8 ft clearance is unsafe for the installing technician and any line co. servicemen as it is an OSHA violation to have a ladder on a sloped roof. People do not spend much time on a sloped roof without permanent access.
This requirement is an OSHA violation, and a direct (unnecessary) conflict between two code giants - NEC and NESC, placing the installer in an impossible situation. (Here the power co. will not connect to an 8 ft mast).
Panel Meeting Action: Reject
Panel Statement: It appears to the panel that the commenter may have intended to refer to Proposals 4-37 and 4-39 rather than 4-38, which deals with an errata. When reviewing the clearance requirements in 234C3d(1) in the National Electrical Safety Code, it should be noticed that the exceptions concerning the suggested clearance requirements for service drops over roofs or balconies contain more text clarifying when a roof is considered to be accessible versus readily accessible and where a roof is not considered to be readily accessible. Taking just a small part of another standard without providing all of the accompanying qualifying text can change the intent of the requirement, as seems the case here.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative:
ROGERS, J.: The panel is correct in rejecting this comment. The submitter has not submitted any technical substantiation for the change. However, this is one of the areas that the task group that has been appointed by the panel chair will be reviewing.

4-19 Log #415 NEC-P04 Final Action: Reject (230.30(A))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 4-52a
Recommendation: In 230.50(a) add: “and service laterals” after “Underground Service-Entrance Conductors” in the heading and text, or alternatively delete “entrance.”
Substantiation: Service laterals should be included. A service may be supplied by a service lateral with non-service-entrance conductors, per the FPN to definition of Service-Entrance Conductors, Underground System.
Panel Meeting Action: Reject
Panel Statement: Section 230.50 is located within Part IV of Article 230 specifically covering service-entrance conductors. Part III of Article 230 covers underground service lateral conductors. Adding “service lateral” to 230.50(A) would thus be inappropriate.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative:
ROGERS, J.: The panel was correct in rejecting this comment in its present format. The task group will be reviewing these requirements as part of their review of the use of the term “Service Point”. I recommend that the submitter resubmit a proposal for the 2011 NEC to be certain that his concerns are adequately addressed in that cycle. It is my opinion that the concerns raised by the submitter are legitimate and should be addressed.

4-20 Log #436 NEC-P04 Final Action: Reject (230.34 (New ) )

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 4-41
Recommendation: Accept proposal.
Substantiation: Same as proposal substantiation. See explanation of negative vote by Mr. J. Rogers.
Panel Meeting Action: Reject
Panel Statement: The proposal and the comment do not provide for all the wiring methods available for service laterals. In rejecting the comment, the panel recognizes that service lateral conductors and service drop conductors are under the exclusive control of the serving electric utility when they are installed on the utility side of the “Service Point” as defined in Article 100 and as established by the serving utility. The panel also recognizes that there are many times when these conductors are installed on the customer side of the Service Point as defined by the serving utility, and these installations are subject to the requirements of the National Electrical Code. This proposal seeks to define the wiring methods required when the installations are performed on the customer side of the Service Point as defined by the serving utility. This NEC requirement does not place any restrictions on these conductors when they are installed on the utility side of the Service Point as defined by the serving utility.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative:
ROGERS, J.: See my comment on Comment 4-19.
4-21 Log #1618 NEC-P04
(230.42(A))

Final Action: Reject

Comment on Proposal No: 4-47

Recommendation: Another portion of this proposal should have been accepted in principal. The panel should accept the concept of the proposal that applies 125% (or 100% for rated overcurrent devices) only to conductors that connect to those overcurrent devices. The panel should also either accept in principal additional wording from the original proposal or change the first sentence to read: “For service-entrance conductors directly connecting to overcurrent devices, the ampacity of the service entrance conductors before the application of any correction or adjustment factors shall be not less than either (A)(1) or (A)(2).”

Substantiation: The panel statement objected to the proposed revision on the grounds that it would only apply to those conductors that directly connect to overcurrent devices. That is as it should be. By allowing 100% rather than 125% for OCDs rated at 100%, the existing language makes it clear that the only reason for increasing the ampacity of a conductor under the rule is that it connects to an overcurrent device. Ampacity is, by definition, the continuous current rating of a conductor, so the conductors that do not connect to OCDs only need to be sized per 310.15. Panel 2 has correctly clarified this point for both branch circuit conductors and feeder conductors. Panel 4 should also recognize the original reason for the 125% rule and clarify this point for service-entrance conductors. The proposed revised text will clarify application of the 125% rule and retain the reference to 310.15 for determining ampacity.

Panel Meeting Action: Reject

Panel Statement: The submitter’s comment describes the requirements for “directly-connecting to overcurrent devices”. The phrase “directly-connecting” is not clearly defined and interpretations of this phrase could cause misapplication of service entrance conductor sizing in field installations.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative: ODE, M.: As the Code is currently written, there are cases where the service conductors are required to be unnecessarily oversized by 25 percent. The proposal attempted to correct this, but would possibly have allowed undersized conductors in some situations. It may be appropriate to address this in the 2011 Code cycle. Further consideration should be given to the various types of equipment that may be used as service equipment, as well as the size of supply conductors mandated by the test requirements of the certification standards for each type of equipment.

ROGERS, J.: The submitters of both the proposal and the comment are correct in their concerns. There were two different although very similar submittals for the language change in this section, one in the proposal stage and one in the comment stage. I agree that this has technical merit and should be changed, however, I also agree with the panel that the language submitted was not sufficiently clear to address all installations and the language was not in a format that could be easily understood by all users of the NEC. The proposal should be resubmitted for the 2011 NEC with new language.

4-22 Log #535 NEC-P04
(230.43(15) and (16))

Final Action: Reject

Comment on Proposal No: 4-50

Recommendation: Accept as revised: (15) One length of flexible metal conduit, or liquid tight flexible metal conduit, or liquidtight flexible nonmetallic conduit not over 1.8 m (6 ft) long between raceways specified in (3), (4), (5) and if metal (8) and (10), or between such raceways and service equipment.

Delete (16).

Substantiation: It appears the intent is to permit one length of flexible conduit, however, actual wording permits daisy chaining of the conduits (between raceways). Present wording permits LMFC and LFRC between nonmetallic raceways of (8), (10), (11), and (16) where the bonding requirements for outside the raceway serve no purpose since there is no grounding path and where inside the conduit no accessible connection points are available. The present (16) infers liquidtight flexible nonmetallic conduit, if used, must be for the entire length of service conductors since there is no 6 ft limitation, but doesn’t prohibit or include short lengths for which no bonding requirements are stated.

Panel Meeting Action: Reject

Panel Statement: As long as the proper bonding jumpers are installed, there is no reason to restrict the various flexible wiring methods to one length. Deleting (16) and incorporating liquidtight flexible nonmetallic conduit into (15) does not add any clarity to the NEC.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-23 Log #597 NEC-P04
(230.44)

Final Action: Accept


Recommendation: We support the panel’s action.

Substantiation: None given.

Panel Meeting Action: Accept

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-24 Log #1213 NEC-P04
(230.44)

Final Action: Accept

Submitter: James W. Carpenter, International Association of Electrical Inspectors

Recommendation: Accept proposal as revised:

“Cable trays used to support (open individual) single conductor service conductors shall only contain service conductors.”

Add to exception: “or the conductors are installed in a raceway or metal covered cable.”

Substantiation: Unless the service conductors are installed as single conductors what is the need for separation? While it may be construed that a solid barrier includes raceways and metal covered cables, that is not clear. Present wording indicates service conductors, even if in a raceway shall not be installed with other conductors. The panel statement that present text does not apply to service conductors in a cable assembly or raceway is not borne out by the wording.

Panel Meeting Action: Reject

Panel Statement: There is no technical substantiation to limit service conductors installed in a cable tray to just single conductor types since 392.9 permits multiconductor cables to be installed in cable trays. In the exception, the use of the word “conductors” is specific to conductors not installed in a raceway or metal covered cable. The purpose of the main text is to permit service entrance conductors to be installed in cable trays with the exception to permit the same cable tray to be used where a proper fixed barrier is installed and proper marking labels are installed. If the cable tray is being used for support of raceways or metal-covered cables, the cable tray is simply a support mechanism and the separation is based on the raceways or metal-covered cables.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-25 Log #414 NEC-P04
(230.44 and Exception)

Final Action: Reject

Submitter: Dan Leaf, Seneca, SC

Recommendation: Accept proposal as revised:

“Cable trays used to support (open individual) single conductor service conductors shall only contain service conductors.”

Add to exception: “or the conductors are installed in a raceway or metal covered cable.”

Substantiation: Unless the service conductors are installed as single conductors what is the need for separation? While it may be construed that a solid barrier includes raceways and metal covered cables, that is not clear. Present wording indicates service conductors, even if in a raceway shall not be installed with other conductors. The panel statement that present text does not apply to service conductors in a cable assembly or raceway is not borne out by the wording.

Panel Meeting Action: Reject

Panel Statement: There is no technical substantiation to limit service conductors installed in a cable tray to just single conductor types since 392.9 permits multiconductor cables to be installed in cable trays. In the exception, the use of the word “conductors” is specific to conductors not installed in a raceway or metal covered cable. The purpose of the main text is to permit service entrance conductors to be installed in cable trays with the exception to permit the same cable tray to be used where a proper fixed barrier is installed and proper marking labels are installed. If the cable tray is being used for support of raceways or metal-covered cables, the cable tray is simply a support mechanism and the separation is based on the raceways or metal-covered cables.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

4-26 Log #1376 NEC-P04
(230.50(A))

Final Action: Accept in Principle

Comment on Proposal No: 4-53

Recommendation: This Proposal should be Accepted as originally proposed.

230.50 Protection of Open Conductors and Cables Against Damage - Above Ground. Service-entrance conductors installed above ground shall be protected against physical damage as specified in 230.50(A) or (B).

(A) Service Cables. Service cables, where subject to physical damage, shall be protected by any of the following:

1. Rigid metal conduit
2. Intermediate metal conduit
3. Schedule 80 rigid metal conduit
4. Electrical metallic tubing
5. Other approved means
Substantiation: In accordance with CMP-8's action on Proposal 8-53, Article 352 will now apply only to "Rigid Polyvinyl Chloride Conduit: Type PVC" rather than "Rigid Nonmetallic Conduit: Type RNC." Therefore, it is necessary to revise the terminology used throughout the remainder of the NEC. As the only type of rigid nonmetallic conduit that is currently listed in Schedule 90 dimensions is rigid PVC conduit, the reference in 230.50(A) should be revised as noted above.

Panel Meeting Action: Accept in Principle

Revise comment to read: (3) Schedule 90 rigid nonmetallic PVC conduit

Recommendation: After the change in 352.2, the phrase used throughout Article 352 is "PVC conduit," with the word "rigid" not used.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

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4-27 Log #489 NEC-P04  Final Action: Accept (230.53)

Submitter: Timothy P. McNeive, Thomas & Betts Corporation

Comment on Proposal No: 4-57

Recomm: Change the panel action to Accept.

Substantiation: The comment accompanying Mr. Young's negative vote should be considered by the CMP and their actin reconsidered. The Technical Correlating Committee should consider the action by several Code-Making Panels during the 2005 and 2008 NEC cycles where the word “rainght" has been, or will be replaced by “wet locations.”

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

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4-28 Log #2154 NEC-P04  Final Action: Accept (230.53)

Submitter: David H. Kendall, Carlon

Comment on Proposal No: 4-58

Recommendation: Proposal 4-58 should continue to be “Accept” by Panel 4.

Substantiation: Panel 8 “Accepted" Proposals 8-26, 8-27, and 8-28 to delete the use of FMC in a wet location per 348.12(1). The Exception found in 230.53 would only reference a “Uses Not Permitted” and would not change the rule.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

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4-29 Log #487 NEC-P04  Final Action: Accept (230.54(A))

Submitter: Timothy P. McNeive, Thomas & Betts Corporation

Comment on Proposal No: 4-59

Recommendation: Change the panel action to Accept.

Substantiation: The comment accompanying Mr. Young’s negative vote should be considered by the CMP and their action reconsidered. The Technical Correlating Committee should consider the action by several Code-Making Panels during the 2005 and 2008 NEC cycles where the word “rainght" has been, or will be replaced by “wet location.”

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

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4-30 Log #488 NEC-P04  Final Action: Accept (230.54(B))

Submitter: Timothy P. McNeive, Thomas & Betts Corporation

Comment on Proposal No: 4-60

Recommendation: Change the panel action to Accept.

Substantiation: The comment accompanying Mr. Young’s negative vote should be considered by the CMP and their action reconsidered. The Technical Correlating Committee should consider the action by several Code-Making Panels during the 2005 and 2008 NEC cycles where the word “rainght” has been, or will be replaced by “wet locations.”

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

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4-31 Log #1902 NEC-P04  Final Action: Reject (230.70(A)(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 4-62

Recommendation: Accept the proposal.

Substantiation: The panel statement is not responsive to the proposal. The proposal does not require the service disconnect to be attached to building, although that is an option. It could also be "immediately adjacent thereto." This wording was chosen because CMP 4 did not want to use a prescriptive dimension, such as ten feet. The proposal also does not change anything with respect to the location of an inside service disconnect. What it does do is place a proximity limit on an outside disconnect. A service disconnect that is at a great distance or out of view from the building served is an unsafe situation.

Panel Meeting Action: Reject

Panel Statement: The proposal reference for this comment should be 4-63 rather than 4-62. The panel was very responsive to the proposal. There was absolutely no technical substantiation provided in either the proposal or the comment to require the service disconnecting means to be attached to or immediately adjacent to the building. In recent Code cycles, the panel has tried to develop a particular distance at which the service disconnecting means can be located outside the building or structure, but based on the architectural design of the building, problems with landscape and plant, and other premises problems, a reasonable distance could not be established. If the unprotected utility company conductors remain outside the building, there really is not a hazard associated with these conductors where properly maintained by the utility company. Where these unprotected conductors enter into a building, it is now necessary to terminate these conductors in a proper overcurrent protection device at a location nearest the point of entrance of these conductors into the building. Requiring the service disconnecting means to be located on the exterior of the building or immediately adjacent to the building or structure, instead of anywhere outside the building or structure, would be too restrictive and would result in too many exceptions. This concept has been acceptable, in one form or another, since the 1897 NEC and should remain as presently written.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

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4-32 Log #813 NEC-P04  Final Action: Accept in Principle (230.71)

Submitter: Timothy M. Croushore, Allegheny Power

Comment on Proposal No: 4-66

Recommendation: Revise the last sentence of 230.71(A) General to put in list format as follows:

For the purpose of this section, disconnecting means used solely for the following shall not be considered a service disconnecting means:

1. Power monitoring equipment
2. Surge protective device(s)
3. Control circuit of the ground-fault protection system
4. Power-operable service disconnecting means, installed as part of listed equipment

Substantiation: The recommended revision is for clarity of the requirements of the last sentence in the original text. Typically, power monitoring equipment and surge protective devices are after-market items installed after the switchboard, panelboard or switchgear is manufactured. Occasionally, ground-fault protection is installed as an after-market item. However, GFP is typically installed by the original equipment manufacturer. As addressed in the original proposal, only Type 2 surge protective devices need to be installed as part of listed equipment as shown in 230.82(8).

Panel Meeting Action: Accept in Principle

Revise 230.71(A) General as follows:

For the purpose of this section, disconnecting means installed as part of listed equipment and used solely for the following shall not be considered a service disconnecting means:

1. Power monitoring equipment
2. Surge protective device(s)
3. Control circuit of the ground-fault protection system
4. Power-operable service disconnecting means

Panel Statement: The final phrase “installed as part of listed equipment” was originally inserted in 1987 as part of the exception for the control circuit of the ground-fault protection system to be installed as part of listed equipment. Section 230.82(8) also applies this same requirement to both ground-fault protection systems and transient voltage surge suppression systems. This layout will make it clear that these four systems must be installed as part of the listed equipment.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10
The points made by the submitter relative to the disconnect needing to be capable of interrupting the load served. The last paragraph of the panel statement is of most concern. Allowing the utility company installation manuals to handle the issue is exactly what is creating major problems across the country today. Utilities are all taking different approaches and imposing different requirements on products. This reduces standardization (which is ironic, since one of the objectives we all have with the adoption of the NEC is to have more consistent installations). This reduction in standardization increases the costs for the end user.

The panel should either accept the proposal which will provide improved wording and requirements or they should delete the text all together.

Panel Meeting Action: Accept in Principle in Part

Accept only the following sentence from proposal 4-73.

“A meter disconnect shall be capable of interrupting the load served.”

Add the word “switch” between the words “disconnect” and “shall”, and insert the sentence at the end of 230.82(3): “A meter disconnect switch shall be capable of interrupting the load served.”

Reject the balance of proposal 4-73.

Panel Statement: The panel agrees with the commenter that this switch must be capable of interrupting the load served.

The title in (A) is “Unswitched Equipment,” so Items (1) through (7) would not apply if the equipment in (A) is installed on the load side of a meter disconnecting means since it would now be switched.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

4-36 Log #1904 NEC-P04 Final Action: Accept in Principle in Part (230.82)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 4-73

Recommendation: Accept the proposal.

Substantiation: The panel statement is in serious error when it describes a meter disconnect as always subject to 90.2(B)(5). If the meter socket is on the load side of the service point (usually but not always the case), then the meter disconnect is premises wiring even if under utility seal, and even if it is installed pursuant to a utility mandate. The fact that a utility can unload a meter is irrelevant, since the existence of the disconnect usually means that the utility has requested it. The panel statement then goes on to complain about the short-circuit capability requirement for the switch, which is bizarre since CMP 4 already located this requirement in the NEC at 230.82(3) and this proposal merely retains the existing requirement. The proposal also carefully accommodates true service disconnects for meter stacks (not, in such cases, meter disconnects). The panel statement is not responsible to the merits of the proposal.

Panel Meeting Action: Accept in Principle in Part

Panel Statement: See panel action and statement on Comment 4-35.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

4-37 Log #1904 NEC-P04 Final Action: Accept in Principle in Part (230.82)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 4-73

Recommendation: Accept the proposal.

Substantiation: The panel statement is in serious error when it describes a meter disconnect as always subject to 90.2(B)(5). If the meter socket is on the load side of the service point (usually but not always the case), then the meter disconnect is premises wiring even if under utility seal, and even if it is installed pursuant to a utility mandate. The fact that a utility can unload a meter is irrelevant, since the existence of the disconnect usually means that the utility has requested it. The panel statement then goes on to complain about the short-circuit capability requirement for the switch, which is bizarre since CMP 4 already located this requirement in the NEC at 230.82(3) and this proposal merely retains the existing requirement. The proposal also carefully accommodates true service disconnects for meter stacks (not, in such cases, meter disconnects). The panel statement is not responsible to the merits of the proposal.

Panel Meeting Action: Accept in Principle in Part

Panel Statement: See panel action and statement on Comment 4-35.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10
Part of Article 250 applied to the bonding. It was intended that the same requirement is necessary in accordance with 90.2(B)(5).

The panel changed the proposed text to 230.82(2) to more accurately describe the specific parts for both grounding and bonding than does the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 4-4

Recommendation: The NEC TCC Grounding and Bonding Task Group recommends that CMP-4 continue to Accept in Principle the proposed changes to 230.95 in Proposal 4-4.

Substantiation: The NEC TCC Grounding and Bonding Task Group concurs with the CMP-4 Panel action to Accept in Principle and statement for the change to the original proposal to 230.95 in Proposal 4-4.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than "accept" taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

Random Number Log #1219 NEC-P04 (230.95)
Final Action: Accept

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 4-4

Recommendation: The NEC TCC Grounding and Bonding Task Group recommends that CMP-4 continue to Accept in Principle the proposed changes to 230.95 in Proposal 4-4.

Substantiation: The NEC TCC Grounding and Bonding Task Group concurs with the CMP-4 Panel action to Accept in Principle and statement for the change to the original proposal to 230.95 in Proposal 4-4.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than "accept" taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

4-42 Log #2334 NEC-P04 (230.95)
Final Action: Accept

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 4-83

Recommendation: Continue to Reject the Proposal.

Substantiation: This proposal is requesting a relaxation of the present safety parameters in the NEC without any substantiation to support such a reduction. The present language has been in the NEC for well over 30 years.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

Comment on Affirmative:

ROGERS, J.: I am voting with the panel on this comment but for different reasons than those stated in the original panel statement on Proposal 4-83. I do not agree with the assumption by the panel that in all cases it is easier to change a fuse than a rating plug. In many cases the opposite may be the case. In either event the panel should base its decision on factual technical language and not on a perceived ease of installation or change issue. I encourage the submitter to resubmit in the 2011 NEC cycle with further technical information.
4-43 Log #1184 NEC-P04
(230.96 (New))

Final Action: Reject
Panel Meeting Action: Reject

Comment on Proposal No: 4-45

Recommendation: The Panel should accept this proposal.
Substantiation: The panel statement does not take into consideration the well documented, multi-injuries, multi-fatals, associated with exposure to any arc flash or blast. While PPE should be considered the last stand on injury prevention, engineering hazards "out of the industry" should be considered the norm, with the knowledge base of the present day industry documentation. This should always be the first stand, when hazards are known, and not the exception. These hazards have been recognized since the early 1980's. Prior to this date, arc blast and flash were considered "the nature of the beast." Electricians "know the hazards" and must take "personal" steps in preventing their exposure to these hazards. This work practice is no longer acceptable. The field employees need all the help we can collect for prevention of these exposures.

Panel Meeting Action: Reject

Panel Statement: The panel recognizes the submitter's concerns, however the submitter of the proposal does not provide the method of installation for current-limiting fuses or circuit breakers at the "source of supply" for the service entrance conductors. For example, the service drop conductors connect to service entrance conductors at the weatherhead. These service entrance conductors are then installed in various types of wiring methods required by 230.40 to the service equipment, such as the meter socket and the service disconnecting means. The proposal appears to require an additional fusible disconnect at the point of connection between the service drop conductors and the connection point (commonly called the service point) for the service entrance conductors. Even if these devices were installed at this location, the installation would be a violation of 240.24(A) requiring overcurrent devices to be readily accessible. The addition of these devices would not eliminate the likelihood of injury. The only way to eliminate injury is to shut off the power.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

Submitter: Mark H. Sumrall, IBEW Local Union 527

4-45 Log #2033 NEC-P04
(230.200, FPN )

Final Action: Reject
Panel Meeting Action: Reject

Comment on Proposal No: 4-86

Recommendation: Delete this FPN completely.
Substantiation: The panel statement indicates the FPN provides NEC Code information with additional information for conductor clearances for utility company conductors on the line side of the service point. Utility conductors on the line side of the service point are not within the scope of the NEC. I fail to see the value of including that information in the US. The NEC does indeed contain provisions that are in conflict with the NEC. Should users decide to utilize the NESC for installations covered by the NEC, the conflicts place the AHJ in a very difficult position. Although the NESC may be useful for some engineering design information, its reference as a source from the NEC implies that it is capable of being used without interference with the use of the NEC. The code loses nothing by deleting the reference, but has increased confusion/conflict with the reference included.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 4-4.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

Submitter: Jim Pauley, Square D Company

4-46 Log #411 NEC-P04
(230.203)

Final Action: Reject
Panel Meeting Action: Reject

Comment on Proposal No: 4-43

Recommendation: Accept proposal.
Substantiation: The Proposal was intended for 230.203. My home and many others have service lateral conductors installed underground by the electrical contractor from a utility owned pad-mounted transformer adjacent to the street.

Panel Meeting Action: Reject
Panel Statement: Neither the substantiation for the proposal nor the one for the comment has provided a technical reason for requiring that wiring methods be installed for service lateral conductors. It is already permissible to install these conductors in a wiring method of either the contractor or the utility company choice.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

Submitter: Dan Leaf, Seneca, SC

4-47 Log #670 NEC-P04
(230.203 (New))

Final Action: Accept
Panel Meeting Action: Accept

Comment on Proposal No: 4-41

Recommendation: The Proposal should continue to be Rejected.
Substantiation: The proposal limits the types of wiring methods to those specifically listed in the proposal. There are numerous other wiring methods and multiconductor cables that are permitted to be used for service entrance and service laterals that have been omitted from the list with no technical substantiation.

The proposal is substantive since it introduces significant changes in the wiring methods permitted and is not simply editorial as stated.

Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

Comment on Affirmative:
ODE, M.: See my explanation of affirmative vote on Comment 4-21.

Submitter: James M. Daly, Upper Saddle River, NJ

4-48 Log #1150 NEC-P04
(230.203 (New))

Final Action: Accept
Panel Meeting Action: Accept

Comment on Proposal No: 4-3

Recommendation: The Panel should continue to reject the proposal. It is also requested that the TCC form a Task Group, or take other appropriate action, to address the concerns and other issues expressed in the Affirmative Comments in the voting for this proposal and Proposals 4-1 and 4-41.
Substantiation: The TCC is correct that changing the definitions and related code rules to redefine what customer-owned conductors are called would require significant work that is beyond the scope of what can be accomplished in this Code cycle and allow for adequate public review.

Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10


4-49 Log #2089 NEC-P04
(230.203)

Final Action: Reject
Panel Meeting Action: Reject

Comment on Proposal No: 4-3

Recommendation: This Proposal should be Accepted in Principle.
Substantiation: The panel action on this proposal should have been accepted or accepted in principle. The submitter has raised an issue that should be addressed relative to the lack of installation requirements for service lateral conductors. For some reason, the submitter only raised the issue with service laterals over 600 volts and I believe that the general requirements should also be addressed. I do not agree with the statement that all service laterals are under the control of the utility companies and that the definition of "service point" supports this opinion. If the panel is not in agreement with this opinion, then a lot of work has to be done within Article 230 to define these conductors as underground service entrance conductors. The basic diagram that is found in 230.1 clearly exhibits that the conductors between a riser pole or underground street main are service lateral conductors up to the terminal box, meter or other enclosure. These conductors are routinely installed by private contractors all across the country. If the panel truly believes that these are not service lateral conductors, then a tremendous change in the basic understanding throughout the electrical system would be required.
ARTICLE 240 — OVERCURRENT PROTECTION

10-2 Log #64 NEC-P10  Final Action: Accept
(240.4(D))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 10-10
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal as it relates to 110.5. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Code-Making Panel 10 accepts the Technical Correlating Committee direction to clarify the panel action on Proposal 10-10 as it relates to 110.5. The following revisions have been made for increased clarity and usability:

1. Use of the term “copper” is necessary for clarity and usability in a section that references both copper and aluminum conductors.
2. The text “through” was editorially changed to “or” per Comment 10-3.
3. The text accepted in the panel action on proposal 10-10 has been editorially revised to comply with the NEC Style Manual and to increase clarity.

The text will now read as follows:

“(D) Small Conductors. Unless specifically permitted in 240.4(E) or (G), the overcurrent protection shall not exceed the following after any correction factors for ambient temperature and number of conductors have been applied:

(1) 18 AWG Copper. 7 amperes, provided all the following conditions are met:
   a. Branch circuit rated circuit breaker listed and marked for use with 18 AWG copper wire
   b. Branch circuit rated fuses listed and marked for use with 18 AWG copper wire

   (2) 16 AWG Copper. 10 amperes, provided all of the following conditions are met:
   a. Branch circuit rated circuit breaker listed and marked for use with 16 AWG copper wire
   b. Branch circuit rated fuses listed and marked for use with 16 AWG copper wire

   (2) Overcurrent protection is provided by one of the following:
   a. Branch circuit rated circuit breaker listed and marked for use with 16 AWG copper wire
   b. Branch circuit rated fuses listed and marked for use with 16 AWG copper wire

   (3) 14 AWG Copper. 15 amperes
   (4) 12 AWG Aluminum and Copper-Clad Aluminum. 15 amperes
   (5) 12 AWG Copper. 20 amperes
   (6) 10 AWG Aluminum and Copper-Clad Aluminum. 25 amperes
   (7) 10 AWG Copper. 30 amperes”

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-3 Log #1619 NEC-P10  Final Action: Accept in Principle
(240.4(D))

Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 10-10
Recommendation: Revise or clarify the part of the proposal that was accepted in principle. The existing text is incorrectly quoted, and although the portion that is incorrectly quoted is not part of the proposed change, it should be clarified. The existing text reads: “Unless specifically permitted in (E) or (G)... not (E) through (G)” as stated in the proposal. The word “through” was change to “or” by ROP 10-23 for the 2005 cycle and this should not be inadvertently changed back without any substantiation.

Substantiation: The issue is fully explained in the comment.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 10-2.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Report on Comments A2007 — Copyright, NFPA

10-4 Log #516 NEC-P10
(240.5(A) Exception (New))
Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 10-12
Recommendation: Accept the proposed new Exception for (A):
Exception: Where permitted elsewhere in this Code to be permanently connected as branch circuit or feeder conductors extra hard usage flexible cords and flexible cables not in contact with heated or heat-producing surfaces shall be permitted to be protected in accordance with 240.4(A), (B), and (G).
Substantiation: The provisions of (A), (B), and (G) do not apply to permanently connected cords and cables as they are excluded by the first sentence of 240.4 and 310.15 does not include them. Table 240.4(G) for example indicates such cords used for motor circuit conductors may be protected at greater than their ampacity in accordance with Article 430 but the first sentence of 240.4 precludes this by excluding flexible cords from (G). For example if a 3-phase motor rated 15.2 ampere could utilize a 12 AWG Type SO cord rated 20 amperes per 400.7(7)(9) for current requirements but if the motor overcurrent protection exceeds 20 amperes (usual case) the cord would be in violation of 240.5(A).
Panel Meeting Action: Reject
Panel Statement: The proposed exception does not increase clarity for users of the Code.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-5 Log #591 NEC-P10
(240.5(B))
Final Action: Accept

Comment on Proposal No: 10-13
Recommendation: We support the panel’s action.
Substantiation: None given.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-6 Log #1214 NEC-P10
(240.5(B))
Final Action: Accept

Submitter: James W. Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 10-13
Recommendation: We support the panel’s action in Accepting this Proposal as written.
Substantiation: None.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-7 Log #1624 NEC-P10
(240.20(B)(1))
Final Action: Reject

Submitter: Wally Harris, Atlantic Inland Inspections
Comment on Proposal No: 10-17
Recommendation: Revise the text of this Proposal to read as follows:
Multiwire Branch Circuit. Except where limited by 210.4(B), individual single-pole circuit breakers, with or without approved handle ties, shall be permitted as the protection for each ungrounded conductor of multiwire branch circuits that serve only single-phase line-to-neutral loads.
Substantiation: The original proposal in the ROP should be reconsidered, and accepted.
First, let us address the aspect of the grounded (neutral) conductor of a multiwire circuit. The grounded conductor carries the unbalanced current in a multiwire circuit. As an example:
120/240 volt circuit
Serviced by spaces 2 and 4 in a panel.
Assume space 2 - "Leg A" is a 20 ampere circuit - with a load of 12 amps. Assume space 4 - "Leg B" is a 20 ampere circuit - with a load of 15 amps.
The current in the grounded conductor would be; 15 amps - 12 amps = 3 amps.
3 amperes is more than enough to cause injury or death.
Even if one leg is switched off in the above noted 120/240 volt circuit, the other leg would still carry current, as would the grounded conductor.
Secondly, let us address the question which is noted in the NOP "Panel Statement" - the "automatic" opening of the overcurrent device, and the further statement of the Panel that a handle tie "does not establish a common trip mechanism."
I would respectfully disagree with the Panel by noting that an Approved Handle Tie is the most basic form of a "common trip mechanism."
The automatic opening of the overcurrent device is not so much the largest safety problem, nor is the unbalanced current in the grounded conductor addressed above. Another safety consideration is what is connected to the circuit in question.
Let us consider a hypothetical situation in a school, hospital, or commercial setting:
Duplex receptacle outlet:
● Top - served by "Leg A" - Serves an assumed Toaster
● Bottom - served by "Leg B" - Serves an assumed Coffee maker.

Maintenance then goes to remove the receptacle and does not realize that the BOTTOM portion that broke is in fact still hot and is injured.
Considering this scenario the problem arises more so when the overcurrent device is serving as a circuit disconnect.
Many so called maintenance persons are ill trained in the industry today, due in part to budget cuts, and staffing cutbacks. All too often a so called maintenance person is no more than a "bulb changer", and is often times assigned tasks that they are not qualified to do.
This is a problem that needs to be addressed at some point in time, and hopefully it will be soon enough to prevent injury, death or other loss.
Panel Meeting Action: Reject
Panel Statement: The submitter is confusing common trip with common disconnect.
The panel reaffirms that handle ties ensure common ON/OFF switching but handle ties do not ensure common tripping under overload. There is a difference between multipole common trip circuit breakers and handle tied individual circuit breakers, and this is discussed, for example, in the NFPA NEC 2005 Handbook on pages 165-167. With respect to single pole circuit breakers applied to multiwire branch circuits serving only single-phase line-to-neutral loads, tripping of the breaker in an ungrounded conductor will remove both current and voltage from that load in a safe manner. There could, indeed, still be current flow in the grounded neutral conductor, but this current will be flowing to a separate load.
The scenario relative to the duplex receptacle is covered in 210.4(B). Here, it is noted that 210.4(B) was expanded in the 2005 Code from dwelling units to also include general multiwire circuits. Thus, a multiwire branch circuit supplying more than one device or equipment on the same yoke shall be provided with a means to disconnect simultaneously all ungrounded conductors at the panel where the branch circuit originated. Individual single-pole circuit breakers would have to be handle tied in order to meet this requirement.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-8 Log #1509 NEC-P10
(240.20(B)(3))
Final Action: Accept

Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc.
Comment on Proposal No: 10-18
Recommendation: Technical Correlating Committee Task Group on the definition of “Neutral Conductor” concurs with the panel action on this proposal.
Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.” Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC), Paul Dobrowsky (CMP 5), Walter Skuggevig (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP 2), Jim Daly (CMP 6, CMP 7, TCC), Bill Laidler (CMP 6), and Oran Post (CMP 2). The TCC
directed that the action on this proposal be sent to the TG for review and comment.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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10-9 Log #53 NEC-P10  Final Action: Accept
(240.21(B)(1), FPN )

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 9-7a

Recommendation: It was the action of the Technical Correlating Committee that this proposal be referred to Code-Making Panel 10 for action. This action will be considered by Code-Making Panel 10 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: Code-Making Panel 10 agrees with the results of the action taken by Code-Making Panel 9. However, Code-Making Panel 10 recognizes that this type of correlation should have been handled by NFPA staff or by a public comment submitted by Code-Making Panel 9 to Code-Making Panel 10.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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10-10 Log #54 NEC-P10  Final Action: Accept
(240.21(C)(2), FPN )

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 10-27

Recommendation: It was the action of the Technical Correlating Committee that this proposal be referred to Code-Making Panel 10 for action. This action will be considered by Code-Making Panel 10 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: Code-Making Panel 10 agrees with the results of the action taken by Code-Making Panel 9. However, Code-Making Panel 10 recognizes that this type of correlation should have been handled by NFPA staff or by a public comment submitted by Code-Making Panel 9 to Code-Making Panel 10.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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10-11 Log #65 NEC-P10  Final Action: Accept
(240.21(C)(2)(1)(c))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 10-11

Recommendation: The Technical Correlating Committee directs that the Code-Making Panel clarify the Panel Action on this Proposal with respect to the location of the added text. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The existing text in 240.21(C)(2)(1)(c), including the submitter’s proposed text, has been revised and placed in a new 240.21(C)(2)(4) to read:

“For field installations where the secondary conductors leave the enclosure or vault in which the supply connection is made, the rating of the overcurrent protective device protecting the primary of the transformer, multiplied by the primary to secondary transformer voltage ratio, shall not exceed 10 times the ampacity of the secondary conductor”.

Panel Statement: The existing text in 240.21(C)(2)(1)(c), including the submitter’s proposed text, has been revised and placed in a new 240.21(C)(2)(4), which is consistent with the structure and text found in 240.21(B)(1)(4).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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10-12 Log #608 NEC-P10  Final Action: Accept in Principle
(240.21(H) (New ))

Submitter: Paul Guiry, Fluor Enterprises, Inc

Comment on Proposal No: 10-33

Recommendation: Accept the proposed wording in Mr. Fredericks’ comments in the ROP, except change the term “overload” to “overcurrent” in 240.21(H)(1). Also, assign a length to the conductors. If the panel disagrees with 25 ft as recommended in my proposal, then the panel should discuss the issue and decide on a suitable length.

Substantiation: The panel statement (“The panel disagrees with the substantiation that there are no restrictions.”) is somewhat incorrect. In my substantiation I did not state that there are no restrictions on these installations. I stated that there are currently no restrictions on how far these unprotected conductors may be routed without an overcurrent device and that nothing specifically requires them to be physically protected. I still believe that to be true, and if it’s not, I’d appreciate it if the panel would reference a section of the Code in the panel statement that indicates where running conductors from batteries with or without overcurrent and physical protection is acceptable.

There has to be some length of conductor from battery terminals to a breaker or set of fuses since the overcurrent protective device cannot be installed directly on the terminals. Mr. Kovacik’s comments are unclear to me. Section 480.3 does indeed govern the installation and will continue to do so, and as such, the general requirements of the Code do too. However, I feel like the general requirements of the Code do not cover these conductors well enough. There are many installations today where the battery conductors are being installed in lengths of 50-100 ft, unprotected against short circuits, ground-faults, overcurrent and overloads, and some of them are not adequately protected from physical damage. Not only do I believe this to be unsafe to personnel, but a fire hazard as well.

I appreciate that the panel is concerned that this new text would apply only to industrial installations. That was my intent. The panel doesn’t indicate whether they think this is a good idea or a bad idea. In my line of work, I’m only concerned about industrial installations, so if the panel feels the scope needs to be broadened it should have been accepted in principle, accepted in part, or accepted in principle in part and the panel could have added what was needed for other installations.

The reason I feel like 25 ft of conductor is reasonable is I’ve yet to see a battery installation where you can’t install a fusible switch or breaker within 25 ft of the batteries. I’m sure that somewhere it is possible that 25 ft would not be sufficient, but I felt like I had to submit the proposal with a given length. Also, the 25 ft tap rule has existed in the Code for years and apparently has withstood the test of time. I don’t know what better substantiation I can provide.

Last, I want to thank the panel for asking the Technical Correlating Committee to assign a task group to this issue. I believe this is something that needs to be addressed this cycle.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 10-13. That action meets the intent of the submitter.

The submitter’s concern relative to the length limitations is also covered in the action taken on Comment 10-13. A specific length limitation, as proposed by the submitter, would not be appropriate for the full range of storage battery installations.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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10-13 Log #1846 NEC-P10  Final Action: Accept in Principle
(240.21(H) (New) )

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 10-33

Recommendation: Accept proposal 10-33 in part, by adding new section 240.21(H) as follows:

“(H) Battery Conductors. Conductors connected to storage battery terminals shall be permitted to be protected against overcurrent at a nonhazardous location as near as practical to the battery terminals.

Substantiation: ACC agrees with Mr. Fredericks’ explanation of negative vote on proposal 10-33. The panel action was inconsistent in that it asserts the basic rule of 240.21 should apply to battery conductors, while at the same time acknowledging that allowing 25 feet to the first overcurrent device might not be enough for some larger installations. The proposed text meets the same intent as the panel action and addresses this issue for general installations, while a companion comment proposes new text for Supervised Industrial Installations in 240.92, in accordance with the text provided with Mr. Fredericks’ explanation of negative vote.

Panel Meeting Action: Accept in Principle

Panel Statement: Revise the recommended wording in the comment to read as follows: “(H) Battery Conductors. Overcurrent protection shall be permitted to be located as close as practical to the battery terminals, within a non-hazardous location. Installation of the overcurrent protection within a hazardous location shall also be permitted.”

Panel Statement: The intent of the submitter has been met. Furthermore, the installation should be consistent with the environment surrounding the overcurrent protective device where due consideration is given to characteristics of DC systems, including the risks caused by the potential of explosion of the batteries, or hazards caused by gases and/or vapors.

Number Eligible to Vote: 12
10-14 Log #413 NEC-P10 Final Action: Reject
(240.24(D))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 10-39
Recommendation: Accept proposal as applied to (E); the designation of (D) was either a misprint or error on my part.
Substantiation: Dormitories in recreational camps, colleges, and penal institutions, without cooking facilities, do not meet the definition of dwelling unit, and are not presently included.
Panel Meeting Action: Reject
Panel Statement: The submitter has presented no substantiation that prohibiting the location of overcurrent devices in dormitories will resolve an issue.
Furthermore, “Dormitory” is not defined in this Code.

Ballot Results: Affirmative: 12

10-15 Log #267 NEC-P10 Final Action: Accept in Principle
(240.24(F))

Submitter: Stanley J. Folz, Morse Electric, Inc.
Comment on Proposal No: 10-40
Recommendation: Text to remain as presented in the ROP.
Substantiation: The Panel action on this proposal should have been to Accept. I am in agreement with the negative comment presented by Mr. Dollard. In addition, the panel statement “refer to CMP 1 for comment and switches are permitted over steps”, was unresponsive to the submitter. Switches are not electrical equipment and do not come under the rules of 110.26. 110.26 does a good job of outlining clearances required for electrical equipment except it does not address a panelboard on a stairway, i.e., there is no provision in 110.26 for a level work area. This is one of those common sense things. We all know it’s wrong. Let’s say it.
Panel Meeting Action: Accept in Principle
Revise the recommended text in Proposal 10-40 to read as follows:
“240.24(F) Not located over Steps. Overcurrent devices shall not be located over steps of a stairway.”
Panel Statement: The panel accepts the concept that overcurrent devices should not be installed over the riser sections of stairways. However, many stairways have horizontal landings that could prove suitable for installations where appropriate working space exists. The prohibition of installations over steps of a stairway satisfies the intent of Proposal 10-40 and Comment 10-15.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-16 Log #1099 NEC-P10 Final Action: Accept in Principle
(240.24(F))

Submitter: James Dollard, IBEW Local 98
Comment on Proposal No: 10-40
Recommendation: This proposal should be Accepted.
Substantiation: The submitter has identified a serious problem. The negative comment as written to this proposal should be further considered by CMP-10. It is important to note that CMP-1 has rejected proposal 1-115 to 110.26(A)(3). This proposal suggested adding the following text: “Stairs or stair treads shall not be permitted as the grade, floor, or platform as referred to in this section.” This proposal was rejected 11 to 1. The panel statement read as follows: “The proposed requirement is restrictive and unnecessary. Qualified persons routinely work from various surface areas and conditions that may be within the workspace. If necessary, the qualified person working on the equipment can create a flat and level workspace. Generally, the height measurement would be from the lowest grade, floor, or platform surface. CMP-1 concludes that the proposal does not contain a clear statement of the problem or substantiation for the change. See the Regulations Governing Committee Projects, sections 4.3.3(b) and (d).”

It is the opinion of CMP-1 that overcurrent devices may be installed in a stairway and that persons maintaining overcurrent devices can “create a flat and level workspace.” I disagree. There is no practical reason to permit, or allude to a perceived permission to allow overcurrent protective devices to be installed in stairways.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 10-15.
Number Eligible to Vote: 12

10-17 Log #1320 NEC-P10 Final Action: Reject
(240.30(C) (New))

Submitter: Vincent J. Saporita, Cooper Bussmann
Comment on Proposal No: 10-41
Recommendation: The original proposal has merit and can be improved with a change or two. The panel should accept this proposal when modified as follows:
(C) Marking. Enclosures containing service or feeder circuit overcurrent protective devices shall be field marked with the amount of available short-circuit current.
Substantiation: This modification limits the requirements to enclosures for service and feeder overcurrent protective devices where there is a greater likelihood that there may be a violation of 110.9. In order to meet 110.9, the installer already has to know the available short-circuit current, so why not mark it on the enclosure. It will make the field inspector’s job of enforcing 110.9 easier by allowing them to easily compare the marked available short-circuit current with the installed overcurrent device interrupting ratings. This marking will have no affect on the plan check process. That must continue as it has in the past.
Panel Meeting Action: Reject
Panel Statement: The comment has not substantiated that a safety issue is being resolved by requiring such a field marking. The accuracy of the marking after initial inspection and installation may become an issue where systems are changed, particularly in industrial settings. It is advisable to request accurate information on the available fault current before adding equipment, revising a system, or performing any work on the electrical system.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

1-107 Log #66 NEC-P01 Final Action: Accept
(240.35)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 10-43
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 1 for action in Article 110. This action will be considered by Code-Making Panel 1 as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to take action on Proposal 10-43 that was originally sent to CMP-10 as a public proposal. The Panel rejects the proposal for the reasons expressed in the panel Statement on Proposal 1-85 as published in the A2007 ROP. See panel action and statement on Comment 1-57. The panel concludes that proposal 10-43 expands the requirements even further than rejected proposal 1-85, as published in the A2007 ROP, in that it would affect all enclosures containing overcurrent devices.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-18 Log #1510 NEC-P10 Final Action: Accept
(240.40(A)(2))

Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc.
Comment on Proposal No: 10-45
Recommendation: Technical Correlating Committee Task Group on the definition of “Neutral Conductor” concurs with the panel action on this proposal.
Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.” Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC ), Paul Dobrowsky (CMP 5), Walter Skuggevig (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP2), Jim Daly (CMP 6, CMP 7, TCC), Bill Lauller (CMP 6), and Oran Post (CMP 6). The TCC directed that the action on this proposal be sent to the TG for review and comment.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
KIMBLIN, C.: NEMA opposes the panel action for the reason expressed with must not only be demonstrated at the interrupting rating of the downstream rating due to dynamic impedance. However, it must be noted that passivity rating, the panel has obviously recognized the challenge of engineering a series substution. 

Recommendation: This proposal should have been accepted.

Substantiation: I agree with the proposal as submitted and believe the proposal should have been accepted. Although the NEC is not a maintenance agreement, many short circuits happen during remodeling or the first time a breaker is turned on. Electricians are not aware that a circuit breaker may not operate properly after a fault. Fine print Notes are for information only, and this information is absolutely necessary.

Panel Meeting Action: Reject

Panel Statement: The Code deals with correct installation rules and does not address how to resolve errors made in the installation that may be recognized during the commissioning process. Errors could impact any component in the electrical system. The panel reaffirms its position as stated in its action on Proposal 10-49.

Ballot Results: Affirmative: 12

KOVACIK, J.: Allowing the determination of acceptable series combinations under engineering supervision is technically counter to the experience and expertise of the manufacturers of the affected downstream products (circuit breakers). It is important for the panel to keep the history of series ratings in mind. Years ago, systems were “engineered” to try to accomplish exactly this information. Manufacturers learned through field and laboratory experience that the “engineering” methods employed were flawed and could result in problems with the application of products in the field. Since learning of those issues, extensive testing programs under strict third party supervision have been developed to determine appropriate safe combinations of overcurrent devices. These testing programs are the only accepted means available to the industry today. The panel is assuming that a “licensed professional engineer” can determine what is needed to engineer a safe system. Circuit breaker manufacturers have licensed engineers that are engaged every day in circuit breaker design and application and those engineers have not been able to establish an acceptable “engineering” method that can consistently and coherently be applied. If an acceptable safety method were available, circuit breaker manufacturers would use it to avoid expensive testing associated with establishing series ratings between circuit breaker combinations and fuse/circuit breaker combinations. The bottom line is that the code panel is allowing a code rule to exist that permits a product to be used in a manner that is directly counter to the instructions issued by the manufacturer and the listing of the product.

We believe that CMP 10 has stepped outside of its scope in allowing engineering supervision as a means of series combination selection to remain. We believe that this attempt to redefine the safety performance of a product in a manner that is above and beyond its rating, directly counter to the product standard and counter to NEC 110.3(B).

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

KIMBLIN, C.: NEMA opposes the panel action for the reason expressed with Comment 10-21.

KOVACIK, J.: Allowing the determination of acceptable series combinations under engineering supervision is technically counter to the experience and expertise of the manufacturers of the affected downstream products (circuit breakers). It is important for the panel to keep the history of series ratings in mind. Years ago, systems were “engineered” to try to accomplish exactly this information. Manufacturers learned through field and laboratory experience that the “engineering” methods employed were flawed and could result in problems with the application of products in the field. Since learning of those issues, extensive testing programs under strict third party supervision have been developed to determine appropriate safe combinations of overcurrent devices. These testing programs are the only accepted means available to the industry today. The panel is assuming that a “licensed professional engineer” can determine what is needed to engineer a safe system. Circuit breaker manufacturers have licensed engineers that are engaged every day in circuit breaker design and application and those engineers have not been able to establish an acceptable “engineering” method that can consistently and coherently be applied. If an acceptable safety method were available, circuit breaker manufacturers would use it to avoid expensive testing associated with establishing series ratings between circuit breaker combinations and fuse/circuit breaker combinations. The bottom line is that the code panel is allowing a code rule to exist that permits a product to be used in a manner that is directly counter to the instructions issued by the manufacturer and the listing of the product.

We believe that CMP 10 has stepped outside of its scope in allowing engineering supervision as a means of series combination selection to remain. We believe that this attempt to redefine the safety performance of a product in a manner that is above and beyond its rating, directly counter to the product standard and counter to NEC 110.3(B).

10-20 Log #1100 NEC-P10 Final Action: Accept (240.86)

Submitter: James Dollard, IBEW Local 98

Comment on Proposal No: 10-50

Recommendation: Continue to Reject.

Substantiation: As noted in the panel statement, no new information is provided by the submitter. The additional text provided by CMP-10 in their action to develop and accept proposal panel proposal 10-50a, will help to clarify the requirement for the licensed professional engineer.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

KIMBLIN, C.: NEMA agrees that markings are required for Engineered series rated system.

Submitter: Code-Making Panel 1, Comment on Proposal No: 10-52

Recommendation: CMP-1 agrees that markings are required for Engineered Series Combination systems (240.86(A)). However, the specifics of the marking should appear in 110.22 that already contains marking requirements for Tested Combinations (240.86(B)). CMP-1 has accepted Proposal 1-98 that deals with these added requirements in 110.22. CMP-1 considers that Proposal 1-98 meets the intent of 10-52 relative to specific markings associated with 240.86(A), however, CMP-1 also believes specific revisions need to be made to the accepted Proposal 1-98 and to the accepted text of Proposal 10-52. For 240.86, it is suggested that a fine print note be added to 240.86 as follows:

FPN: See 110.22 for marking requirements for Series Combination Systems. For 110.22, CMP-1 will submit a comment on Proposal 1-98, Section 110.22, that will divide the section into an (A), (B), (C) paragraph style section titled “110.22 Identification of Disconnecting Means,” with the following subites “(A) General”; “(B) Engineered Series Combination Systems,” and “(C) Tested Series Combination Systems.” This revision is intended to separate and clarify the various marking requirements in 110.22. In addition, both FPNS are being proposed for revision as follows:

Under subsection (B) - “FPN: See 240.86(A) for requirements for Engineered circuit breaker but also through the entire amperage range up to the maximum available short circuit current (the series rating). How can an engineer demonstrate such performance? The only method known today in the industry is through testing. Appropriation of the present available circuit breaker data is not yet feasible.” This guidance is misleading because clearing is not the issue but rather contact opening. The technical challenge is understanding when the downstream contacts will begin to open, thus introducing dynamic impedance, not when the fault will actually be cleared. Passivity implies that the contacts remain closed until the line-side device clears the fault. Where does an engineer obtain this information?

It is well known that the current flow through a set of contacts will be constricted to a very small area of the contact (Circuit Interruption Theory and Techniques, edited by Thomas E Browne, Jr., Marcel Dekker, 1984, page 582). The current flow near the surface of the contacts results in a repulsion force, known as contact formation force, that will attempt to blow the contacts open. Unless the current path in the downstream circuit breaker is of a blow-off design, which the engineer would not likely know, at some current level the contacts will blow open. The question is, will this level be below or above the current limiting level of the upstream overcurrent device?

Circuit breaker manufacturers do not publish the levels at which the contacts of their devices blow open. It may not be possible to even ask the question as the manufacturer may no longer be in business, may not have this information for obsolete designs or may be unwilling to release it for current designs for various legitimate reasons. The only means to understand these values across the amperage range is to test the overcurrent device.

In tested series ratings, the UL 489 standard requires intermediate level testing to determine the level of short circuit current at which only downstream circuit breaker opens and the level at which both devices open. This is to insure that the combination will safely operate at all fault levels. Determining this is not always possible to do in the field and requires a measured approach.

In summary, it is not possible with the information available for an engineer to calculate a series rating. The only means to understand if an overcurrent device will remain passive is to understand its characteristics across the entire amperage range. The safety implication of permitting such a rating without any industry supported engineering method places people and property at risk.

Panel Meeting Action: Reject

Panel Statement: In past panel statements, the merits as well as the limits of engineering of series rated systems have been discussed. In no case did the panel infer, state, or suggest that all circuit breakers can be applied in an engineered series rated system.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

KIMBLIN, C.: NEMA agrees that the additional wording in 240.86(A) dealing with circuit breaker passivity is a necessary caution for the application of engineered series ratings. However, NEMA considers the example, Comment 10-23, of an attempted engineered series rating by the engineering community as demonstrating that a series rating cannot be engineered. In fact, the only reason that the safety of the system was preserved, in this case, was due to “tested combinations”. Without testing the combination of equipment, it would not have been recognized that the integrity of the system would have been placed in jeopardy. NEMA reaffirms its position that testing is the only method to ensure the integrity of a series rating within an electrical system.

KOVACIK, J.: See my explanation of negative vote on Comment 10-20.

10-22 Log #348 NEC-P10 Final Action: Accept in Principle (240.86(A))
Series Combination Systems. and under subsection (C) “FPN; See 240.86(B) for requirements for Tested Series Combination Systems.”

Substantiation: This comment was developed by a Task Group of CMP-1 members to address actions taken by CMP-10 on Proposal 10-52, which was referred to CMP-1 by CMP-10. Members of the Task group included Louis Barrios, Jr.; Kenneth Boyce; Mark Christian; Neil LaBrake; Lanny McMahl; Eli Moniz; and John Minick. Identification requirements for disconnecting means have been identified with 110.22 since the 1965 NEC edition and marking requirements for series combination systems have been associated with 110.22 since the 1990 NEC when the requirement for series combination systems first appeared. CMP-1 and CMP-10 both received similar proposals for marking requirements for Engineered Series Combination Systems that first appeared in the 2005 NEC edition. It is CMP-1’s opinion that marking requirements for Series Combination Systems should remain in 110.22 and that technical requirements and descriptions of Series Combination Systems should remain in 240.86. In addition, such marking requirements for Series Combination Systems should not be separated into completely different NEC articles, as would be the case for the 2008 NEC if Proposal 10-52 is accepted by CMP-10.

This comment was balloted through CMP-1 with the following final ballot results:
12 Eligible to Vote
11 Affirmative
1 Not Returned (L. Barrios, Jr.)

Mr. P. Hickman voted affirmatively stating: “We are in general agreement with the content of the proposal including dividing the section into (A), (B), and (C). However, we feel the use of the word “requirements” is in violation of 3.1.3 of the NEC Style Manual.

Panel Meeting Action: Accept in Principle
Revised the first fine print note to read as follows: “FPN: See 110.22 for marking of Series Combination Systems.”

In the fine print notes in 110.22(B) and (C), remove the words “for requirements.”

Panel Statement: The wording has been revised to comply with the NEC Style Manual.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Panel Meeting Action: Accept in Principle
Revise the first fine print note to read as follows: “FPN: See 110.22 for marking of Series Combination Systems.”

In the fine print notes in 110.22(B) and (C), remove the words “for requirements.”

Panel Statement: The wording has been revised to comply with the NEC Style Manual.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Final Action: Reject 240.86(A)

Submitter: Ed Larsen, Square D Company
Comment on Proposal No: 10-50
Recommendation: The Panel should accept Proposal 10-50 to delete 240.86(A).

Substantiation: The present language in 240.86(A) permits the engineering of series ratings that may leave the electrical system unprotected. The Panel has wrestled with this topic for a number of cycles with the supporting discussion at the Panel meeting indicating “it has been done for years and there is no issue, please show me an example of where an engineered system has failed.” The false assumption behind this argument is that there is no “real world” data to back this position. There is no operational data on the engineered overcurrent device systems that would support that they operate appropriately when called upon to perform. However, there is now a “real world” example of the electrical industry working together in a failed attempt to engineer a series rating.

The following is a “real world” example of why series ratings cannot be engineered in the field. The only reason this unsafe engineered series rated system is not in use today is because the design was tested before it was installed.

In early 2005, a developer in Seattle planned to add a second apartment building adjacent to an existing building already owned by the developer. The service entrance in the existing building is a bolted pressure switch with 1400A Class L fuses feeding group metering. The tenant main circuit breakers in the NEMA 1 meter centers are 100A 2-pole circuit breakers rated 42kAIR and the branch circuit breakers in the residential tenant load centers are rated 10kAIR. A licensed professional engineer engaged primarily in the design of electrical installations was hired to design the electrical system for the new building. Originally, it was planned to use a new transformer located in the vault in the existing building to feed both buildings. The existing transformer is a 75kVA 20.4kV/208V unit. The proposed new design would have replaced this transformer with three 15kVA 208V transformers. Each of these transformers would have increased the available SCA from 47kA to 93kA per Seattle City Light. The fuse manufacturer stated that there was not a UL listed 100/42kA series rating with the existing tenant main circuit breakers, thus the desire to engineer a series rating for the circuit breakers in the original building.

With the 1400A fuses in the bolted pressure switch, the fuse manufacturer stated that the “up-over-down” method indicated the tenant main circuit breakers would be adequately protected as the let-through current would be 34kA at a perspective available SCA of 93kA. A flow chart from a second consulting engineer suggested that if the circuit breakers were not of a “blow-open” design, then a series rating could be engineered using the up-over-down method. The technical literature published by another fuse manufacturer confirmed this. A check with the circuit breaker manufacturer indicated that these circuit breakers had a “conventional” current path construction, not a “blow-open” design.

A short circuit study indicated that any panels located 40 feet or more from the meter center would have 10kA or less available, thus they would be fully protected. The plan was to install a 100A 2-pole 42kAIR circuit breaker of the same type installed in the original building upstream and a 100A 2-pole 42kAIR circuit breaker of the same type installed in the original building downstream. The circuit breaker cases ruptured during these tests. The observed let-through current in both tests was 25kA.

Since Tests #1 and #2 were run at 240V and the service is actually 208V, a third test was conducted to see if the lower voltage would improve the results. Test #3 was conducted at 93kA at 208V single phase with a more current limiting 1400A Class L fuse upstream and a 100A 2-pole 42kAIR circuit breaker of the same type installed in the original building downstream. The original building downstream, housed in a NEMA 3R enclosure. After the test the circuit breaker could not be reset and the enclosure cover was bent.

At this point, use of Class T fuses was considered, however, Class T fuses could not be installed in the existing bolted pressure switch and are not available above 1200A, thus this was not an available option.

A new short circuit study was conducted to take into account the impedance of the utility’s conductors within their vault, indicating that there would be only 77kSCA available at the bolted pressure switch. With this new information, Test #4 was conducted using the same fuse and circuit breaker as in Test #3, except at 80kA 208V. Once again the circuit breaker failed.

Finally, Test #5 was conducted at 80kA at 208V single phase with the same 1400A Class L fuse upstream as was used in Test #3-4, except a 100A 2-pole 65kAIR circuit breaker from a different manufacturer was used downstream. This circuit breaker also failed during the test.

Increasing the length of the service conductors by 140 feet by wrapping them around the vault was considered as this would have reduced the available SCA below 42kA but this approach was unacceptable to Seattle City Light. The final solution was to build a vault in the new building to house a transformer to feed just the new building.

In his final letter to the City of Seattle Department of Planning and Development, the engineer stated, “The conclusion I have reached is that relying on the “up-over-down” let-through curves to determine the available fault current to downstream devices is not reliable, and if this method is used, engineers should suggest the circuit be tested.” The engineer considers it fortunate that the developer was willing to pay for the short circuit testing, even though it is not required by 240.86(A), otherwise a potentially hazardous condition would have been created.

The last question that remains is the passivity of the downstream circuit breaker. There is no literature or technical documentation that discusses or explains how to ensure a device is passive. These engineers did not understand that impact of the dynamic operating characteristics of the circuit breaker, and even if they did, where would they have obtained that information? And how is an engineer supposed to address the equipment impact, such as the failure point of the bus structure or the enclosure as demonstrated in this example? Safety is being compromised in 240.86(A).

In summary, a few key points are apparent with this new information:
1) Two consulting engineers and a fuse manufacturer were involved in attempting to engineer a series rating with the circuit breakers in an existing building in accordance with 240.86(A).
2) Technical literature from two fuse manufacturers supported the failed engineering method used for this series rating.
3) Five series rating tests were conducted in the fuse manufacturer’s short circuit test laboratory in accordance with the UL 489 test procedure. All five tests failed.
4) It should also be noted that the equipment enclosure was damaged as well, which is entirely ignored in the NEC, and there is no technical method...
equal to 11 times the current rating of the circuit breaker or greater for engagement of a response mechanism that will open the circuit within 1-cycle. A circuit breaker that meets these response requirements shall be known as a DIT circuit breaker. Proposed revision text for UL 489 specifying the additional tests required in Section 7 accompanies this proposal as a substantive document. A new article 240.87 will limit the installation requirements of DIT circuit breakers to dwelling units, with exceptions for certain hi-inrush loads, specific conductor applications and where other overcurrent protection articles apply. A labeling requirement will permit easy identification and differentiation from non-DIT circuit breakers upon installation.

Panel Meeting Action: Reject
Panel Discussion: The Committee example is a verification that the existing Code text is appropriate (see Proposal 10-50a). In past panel statements, the merits as well as the limits of engineering of series rated systems have been discussed. In no case did the panel infer, state, or suggest that all circuit breakers can be applied in an engineered series rated system.
The concept that the up-and-down method used to determine available fault current is incorrect. Both fuse and circuit breaker let-through curves are accurate for determining let-through currents for comparison with all protective devices that are passive during the operating time of the current-limiting device.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
KIMBLIN, C.: NEMA opposes the panel action for the reason expressed with Comment 10-21.
KOYAVIC, J.: See my explanation of negative vote on Comment 10-20.

Final Action: Accept (240.86(A))
Submitter: James Dollard, IBEW Local 98
Comment on Proposal No: 10-54
Recommendation: Continue to Reject.
Substantiation: As noted in the panel statement to reject proposal 10-50, no new information is provided by the submitter. The additional text provided by CMP-10 in their action to develop and accept proposal panel 10-50a, will help to clarify the requirement for the licensed professional engineer.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2
Explanation of Negative:
KIMBLIN, C.: NEMA opposes the panel action for the reason expressed with Comment 10-21.
KOYAVIC, J.: See my explanation of negative vote on Comment 10-20.

Final Action: Reject (240.87)
Submitter: Paul A. Keleher, Paul Keleher Electrical Services
Comment on Proposal No: 10-55
Recommendation: The Submitter asks the CMP to Accept-in-Principle the following Recommended Committee Action Text in lieu of originally submitted text:
Attached as supporting documentation is Recommended Committee Action Text for the proposed revision to UL 489, and substantiation for changes to the text.
NEC Section/Paragraph: Article 240.2.) Add new definition to 240.2
Defined Instantaneous Trip (DIT) Circuit Breaker. A circuit breaker that opens within 1 cycle of being subjected to an overcurrent equal to 11 times its rated current or greater.

Report on Comments A2007 — Copyright, NFPA 70-116
The submitter believes the reason why the CMP has determined that the Panel also stated, "The 'DIT 'concept was presented to the NEC during the rejection, the CMP stated, "The panel understands that the submitter's present, 4 of 5 major product lines are at or close to the proposed threshold to improve overcurrent protection, in addition to pursuing the potential benefit of present means of coordination between product and installation requirements to ensure that the intention of 250.4(A)(5) is met. This proposal achieves that goal for the majority of outlets (65% in the test sample) by standardizing the magnetic response threshold current setting at 11-times-handle-rating. Presently, 4 of 5 major product lines are at or close to the proposed threshold requirement; one intent of this proposal is to ensure the user community that all circuit breakers installed in dwellings provide equivalent magnetic pick-up settings in response to branch circuit level overcurrent, and that these responses cannot be elevated above the proposed minimum requirement at some time in the future. For outlets whose available fault current is below the threshold proposed, this submittal plans a follow-up proposal in the 2011 NEC revision cycle to limit impedance at the furthest outlet on a circuit to assure sufficient available fault to trigger a standardized instantaneous trip and meet the intent of 250.4(A)(5) at all installed outlets.

In its rejection, the CMP stated, “The panel understands that the submitter’s intent is to limit the energy delivered from a fault condition … to mitigate the risk of fire.” The CMP underscores the submitter’s intent, which is not only to reduce the risk but to reduce other inherent faults. Fault current as well as such (1) reduce damage to wire, circuit and equipment components and appliances that may be subjected to unnecessarily prolonged fault current from a thermal breaker response, (2) reduce risk of electrocution or exposure to arcing fault current that may be exposed to the exterior of an outlet or appliance, and (3) to assure that the non-arcing NEC Article 68-26 Log #67 NEC-P10 Final Action: Accept (240.91) Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 10-56 Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to introducing a single subsection. This action will be considered by the Panel as a Public Comment. Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects. Panel Meeting Action: Accept Panel Statement: The request of the Technical Correlating Committee Panel Statement: The request of the Technical Correlating Committee has been addressed by the action taken on Comment 10-27. Number Eligible to Vote: 12 Ballot Results: Affirmative: 12

10-27 Log #260 NEC-P10 Final Action: Accept (240.91) Submitter: Carl J. Fredericks, The Dow Chemical Company Comment on Proposal No: 10-56 Recommendation: Continue to accept, but revise the wording as follows: 240.91 Protection of Conductors. Conductors shall be protected in accordance with 240.91(A) or (B). (A) General. Conductors shall be protected in accordance with 240.4. (B) Devices Rated over 800 Amperes. Where the overcurrent device is rated over 800 amperes, the ampacity of the conductors it protects shall be equal to or greater than 95% of the rating of the overcurrent device defined in 240.6, where the conductor is protected within recognized time vs. current limits for all short circuit currents of up to 1000 seconds duration. Substantiation: This is a proposed editorial change, reflecting better code text that was developed to improve the clarity. Panel Meeting Action: Accept Number Eligible to Vote: 12 Ballot Results: Affirmative: 9 Negative: 3 Explanation of Negative: KIMBLIN, C.: NEMA opposes the panel action for the reason expressed with Comment 10-29. SOBEL, R.: I would reject the Proposal 10-56 thus this editorial change would not be needed. See substantiation on Comments 10-29 and 10-30.

10-28 Log #959 NEC-P10 Final Action: Accept in Principle (240.91) Submitter: Mark C. Ode, Underwriters Laboratories Inc. Comment on Proposal No: 10-56 Recommendation: Delete the phrase “unless otherwise permitted in 240.91(A)” at the end of the first sentence and turn (A) into an exception as follows: 240.91 Protection of Conductors. Conductors shall be protected in accordance with 240.4 *unless otherwise permitted in 240.91(A)*. *Explanation*: Where the overcurrent device is rated over 800 amperes, the ampacity of the conductors it protects shall be equal to or greater than 95% of the rating of the overcurrent device defined in 240.6, where the conductor is protected within recognized time vs. current limits for short circuit currents of up to 1000 seconds duration.

Substantiation: NEC Style Manual does not permit a (A) with a single subsection so the phrase “unless otherwise permitted in 240.91(A)” has been
The commenter also did not acknowledge that higher percentage overloads in industrial installations are monitored or protected in this manner. The code wording in 240.92 is intended to cover all Supervised Industrial Installations. However, the words “common practice” acknowledge that, in many cases, the additional monitoring and/or design will not be present. In those cases, the conductors will not be fully protected against overload. Proposal 10-56 should be rejected because it will permit conductor protection above their ampacity for all currents above 800A. This will also impact the performance of electrical equipment negatively. Thus, the panel continues to take a position that equipment can be used outside the permitted listing safety standard. The interaction of multiple overcurrent devices within equipment further complicates any attempt to reduce the conductor size and impact adjacent components. Consider a fusible switchboard with not only devices over 800A, but also those 800A and below. The increase in heat from smaller conductors will not only increase the heat on devices over 800A, but the additional heat will likely impact the integrity of the equipment. Failure to address these concerns places the manufacturer in the unfortunate position of having an NEC requirement that is in direct conflict with NEC 110.3(B).

KOVAČIK, J.: The issue here is virtually identical to that raised in Proposal 10-9, which the Panel rejected. Specifically, quoting from the Panel Statement on Proposal 10-9, “It is noted that the amount of heat generated in a conductor increases as the square of the current through that conductor, and the characteristics of overcurrent devices are such that overloads are tolerated for significant periods of time before the device operates. At the very least, a study should be conducted to demonstrate that the devices and equipment would not sustain damage from carrying the current permitted by this proposal.” SOBEL, R.: I agree with the submitter’s substantiation and believe Proposal 10-56 should be a reject. Furthermore, the devices are not tested and listed with smaller conductors. See the substantiation for Comment 10-30.
is conducted by a staff of design engineers from the manufacturer and UL engineers? Reject this proposal.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 10-29.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

KIMBLIN, C.; NEMA opposes the panel action for the reason expressed with Comment 10-29. KOVACIK, J.; See negative ballot and substantiation on Comment 10-29.

SOBEL, R.; I agree with the submitter’s substantiation.

10-31 Log #941 NEC-P10 Final Action: Reject

(240.92(B))

Submitter: Robert G. Fahey, City of Evansville

Comment on Proposal No: 10-21

Recommendation: Revise text to read as follows: (B) Feeder Taps. For feeder taps specified in 240.21(B)(2), (B)(3), and (B)(4), the tap conductors shall be permitted to be sized in accordance with Table 240.92(B) when the calculation is performed by a licensed professional engineer engaged primarily in the design or maintenance of electrical installations. The selection shall be documented and stamped by the professional engineer. This documentation shall be available to those authorized to design, install, inspect, maintain, and operate the system.

Substantiation: The new calculation which the CMP approved should only be allowed when the calculations are performed by an engineer who is familiar with the electrical installation at the supervised industrial location. With the additional language, it will clearly require an engineer to perform the calculation and with this requirement, it will help the electrical inspector be assured the wire is, in fact, protected properly. The additional wording is taken from 240.86(A) for series rated systems. My other concern is that this installation will continue to be safe after the initial installation, will other types of overcurrent devices be installed in the future which will change the characteristics of the circuit, thus having a negative impact on the tap conductor.

Panel Meeting Action: Reject

Panel Statement: The determinations needed to correctly apply this rule are well within the capabilities already required for a supervised industrial installation in 240.2, which requires conditions of engineering supervision among other qualifications.

The calculations referenced are simple and are performed daily by engineers and engineering designers.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

KIMBLIN, C.: NEMA votes affirmatively on the panel action but disagrees with the panel statement. See NEMA reason for its negative vote with Comment 10-32.

10-32 Log #1419 NEC-P10 Final Action: Reject

(240.92(B) (New ))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)

Comment on Proposal No: 10-21

Recommendation: The Proposal should be Rejected.

Substantiation: These proposed changes to the tap rules, even for supervised industrial installations, can reduce electrical safety. NEMA also disagrees with the panel statement that these relaxed rules increase the enforceability of the tap rules. There is no “trigger” to indicate when the replacement of an overcurrent device may be placing not only the conductor protection at risk, but also the facility and the electrical maintenance personnel working around these “protected” conductors. Industry currently assumes that you can replace an overcurrent device with a comparable rated overcurrent device and the conductors will continue to be protected. In order to assure electrical safety, industry must now assume that all conductor sizes are being based on temperature calculations before replacing overcurrent devices.

The submitter indicates the value of this proposal is in providing a “significant cost savings for electrical distribution systems, allowing North American manufacturers to be more competitive in the global marketplace.” The submitter only considers the initial installation and not the electrical safety and down time over the life of the system which has significant implications.

All overcurrent device replacements must now be confirmed against ALL load side conductor sizes to understand if a tap conductor calculation has been applied during the initial installation before replacement and energizing can take place.

These proposed tap rules require an in-depth knowledge of the overcurrent device characteristics. Once again, this information is required not only during initial system installation, but throughout the maintenance life of the system to ensure either an identical overcurrent device replacement or reengineering of the system and possible replacement of the conductors to ensure appropriate protection is maintained.

The action of the panel to reject the inclusion of this proposal as part of the general tap rules in 240.21 indicates a safety issue does exist, however, the panel does not explain what safety issues are resolved by restricting to a supervised industrial location. How does the panel action enhance enforceability? It simply removes the need for enforcement from many electrical installations.

At what enforceability exists to recheck the tap conductors when the available fault current changes serving the facility? An increase in the available fault current by a utility may be well within the maximum short circuit current rating of the service equipment, however, the tap conductor protection may have been calculated based on the previous available fault current. Is a utility notification process necessary to ensure electrical safety when these calculations are utilized within a facility?

The submitter further claims these rules are used around the world. There has been no substantiation presented, even with the claim of other world market acceptance, which support the work practices that would be necessary to ensure the safety of this installation over the life of the facility. Making this change requires careful consideration as this change will impact work practices and the safety of facilities and personnel.

Panel Meeting Action: Reject

Panel Statement: The determinations needed to correctly apply this rule are well within the capabilities required for a supervised industrial installation, which requires conditions of engineering supervision among other qualifications.

The calculations referenced are simple and are performed daily by engineers and engineering designers and do not require any detailed knowledge of overcurrent device characteristics, only standard curves and data that are available on every manufacturer’s website.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

KIMBLIN, C.: Overcurrent protection rules in the NEC need to be uniformly applied across all applications and for the life of the facility. This revision for industrial supervised installations creates a significant anomaly to that uniformity. The expectation that the system is controlled enough to be able to have such exacting requirements for tap-conductor protection is a flawed expectation. The calculation should have to be performed not only during initial installation, but also for subsequent system upgrades due to higher available fault currents from the utility. In particular, the characteristics of the overcurrent protective device have to be taken into account, both during initial installation and during possible subsequent replacement.

Further, it is unclear whether the tap conductor sizing calculation would be based on the calculated available fault current or on the fault current rating of the overcurrent protective device. If the sizing calculation were based on the actual available fault current level, then available fault current changes due to fluctuations in utility parameters may establish unprotected conductors in the facility’s electrical system. It would be necessary for the utility to notify the facility of such parameter changes. However, based on the present challenges in establishing the appropriate values for performing calculations for use in determining the level of PPE for NFPA 70E, utilities are not presently in a position to provide actual values of available fault current.

The present tap rules have served well in a large variety of installations and they are consistent with the engineering and long-term maintenance approaches taken in installations including supervised industrial installations. It is noted that a similar proposal (11-45) for determining the characteristics of tap conductors under engineering supervision was rejected by CMP-11 at the proposal stage with a reaffirming position in the comment stage on Comment 11-15.

KOVARICK, J.: No technical substantiation has been provided to support the proposed relaxation of the rules for determining the ampacity of tap conductors. Restricting this relaxation to supervised installations does not ensure that all safety issues associated with conductors carrying currents higher than normally allowed will be resolved. The proposed formulas seem complex and onerous, and are better suited for a design manual than the NEC.

10-33 Log #1850 NEC-P10 Final Action: Reject

(240.92(E) (New ))

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 10-33

Recommendation: Accept proposal 10-33 in part in principle, by adding new section 240.92(E) as follows:

(E) Battery Conductors. Each set of battery conductors feeding separate loads shall be permitted to be connected to storage batteries, without overcurrent protection at the battery, as specified in 240.92(E)(1) or 240.92(E)(2).

(1) Battery Conductors. Conductors from battery terminals shall be permitted to be protected from overload where the following conditions are met:

(a) The battery conductors are protected from physical damage by being enclosed in approved raceways or other approved means from the battery terminals to the overcurrent device. The positive and negative conductors may be enclosed in separate non-magnetic raceways.

(b) The ampacity of the battery conductors is not less than the design load...
Battery Conductors From Chargers. Conductors from the battery charger
KIMBLIN, C.: NEMA opposes the panel action for the reason expressed with
For the location of storage battery conductor overcurrent protection, see the
Committee to review its action. See panel action on Comment 5-128.
Panel Meeting Action: Accept
Governing Committee Projects.
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Substantiation: The Technical Correlating Committee Task Group on
Grounding and Bonding agrees with the action of CMP-5 on Proposal 5-76. It is
understood that the revisions in the proposal that were accepted in principle
have generated new CMP-5 proposals for each section independent of this
proposal and action. The CMP-5 revisions to this proposal and the CMP-5
proposals 5-75a, 5-121a, 5-125a, 5-213a, 5-217a and 5-224a have been made
for clarity and continue to be consistent with the TCC Grounding and Bonding
Task Group’s original initiatives.
This Comment was developed by a Task Group assigned by the NEC
Technical Correlating Committee to address actions that were other than
“accept” taken by Code-Making Panels on proposals from the TCC to resolve
2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on
Grounding and Bonding for this Comment included: C. Douglas White;
Michael Johnston; Jeffrey Boksiner; Daleep Mohia; Phil Simmons; Christopher
Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and
Neil F. LaBrake, Jr.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

ARTICLE 250 — GROUNDING

5-23 Log #31 NEC-P05 (250) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 5-48
Recommendation: The Technical Correlating Committee notes that in the
proposal the text for 250.96(A) is incorrect in that it does not reflect the
existing code text. The Technical Correlating Committee understands that the
word “effectively” is to be deleted in 250.96(A). The Technical Correlating
Committee directs that the panel reconsider the proposal and verify the action
in 250.96(A). This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating
Committee to review its action. See panel action on Comment 5-128.
Number Eligible to Vote: 15

5-24 Log #1229 NEC-P05 (250) Final Action: Accept
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 5-76
Recommendation: Continue to accept the TCC Grounding and Bonding Task
Group proposal 5-76 as modified by the actions of CMP-5. Please see Proposal
5-76 for affected sections.
Substantiation: The Technical Correlating Committee Task Group on
Grounding and Bonding agrees with the action of CMP-5 on Proposal 5-76. It is
understood that the revisions in the proposal that were accepted in principle
have generated new CMP-5 proposals for each section independent of this
proposal and action. The CMP-5 revisions to this proposal and the CMP-5
proposals 5-75a, 5-121a, 5-125a, 5-213a, 5-217a and 5-224a have been made
for clarity and continue to be consistent with the TCC Grounding and Bonding
Task Group’s original initiatives.
This Comment was developed by a Task Group assigned by the NEC
Technical Correlating Committee to address actions that were other than
“accept” taken by Code-Making Panels on proposals from the TCC to resolve
2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on
Grounding and Bonding for this Comment included: C. Douglas White;
Michael Johnston; Jeffrey Boksiner; Daleep Mohia; Phil Simmons; Christopher
Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and
Neil F. LaBrake, Jr.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-25 Log #1232 NEC-P05 (250) Final Action: Accept
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 5-77
Recommendation: Continue to accept the TCC Grounding and Bonding Task
Group proposal 5-77 as modified by the actions of CMP-5. Please see Proposal
5-77 for affected sections.
Substantiation: The Technical Correlating Committee Task Group on
Grounding and Bonding agrees with the action of CMP-5 on Proposal 5-77. It is
understood that the revisions in the proposal that were accepted in principle
have generated new CMP-5 proposals for each section independent of this
proposal and action. The CMP-5 revisions to this proposal and the CMP-5
proposals 5-77a, 5-102a, 5-247a, 5-252a, 5-252b, 5-253a, 5-294a, 5-301a, 5-
313a, 5-329a have all been made for clarity and continue to be consistent with
the TCC Grounding and Bonding Task Group’s original initiatives.
This Comment was developed by a Task Group assigned by the NEC
Technical Correlating Committee to address actions that were other than
“accept” taken by Code-Making Panels on proposals from the TCC to resolve
2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on
Grounding and Bonding for this Comment included: C. Douglas White;
Michael Johnston; Jeffrey Boksiner; Daleep Mohia; Phil Simmons; Christopher
Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and
Neil F. LaBrake, Jr.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-26 Log #1519 NEC-P05 (250) Final Action: Accept
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 5-76
Recommendation: The Panel Action to Accept in Principle is correct,
however, the Panel Action shows 250.32(B)(3) as Accept and that section does
not exist. The reference should have been to 250.32(B)(2)(3).
Substantiation: 250.32(B)(3) does not exist in the 2005 Code, the 2008
Preprint, Proposal 5-121a, nor Proposal 5-119.
Panel Meeting Action: Accept
Group Eligible to Vote: 15
Ballot Results: Affirmative: 15

70-120
In order to use the theory of symmetrical components on three-phase systems, Other IEEE Standards such as the ANSI/IEEE Std 141-1993, IEEE Recommended Practice for Electric Power System Operation, and the ANSI/IEEE Std 241-1990, IEEE Recommended Practice for Electric Power Systems Safety, International Association of Electrical Inspectors, Park Ridge, IL, 1981. The short circuit analysis in Chapter 4 of the “Buff Book” roughly relates to paralleling two impedances together and reducing the overall impedance by the square root of the sum of the squares of the individual impedances. The reacting Committee notes that the revised definition will create correlation issues with the use of the term “ground fault” in other parts of the Code such as 230.95, the requirement for ground fault protection of equipment.

The Technical Correlating Committee also directs that Proposal 5-58 be reported as “Hold” because the Fine Print Note is related to the definition in Proposal 5-57 and Comment 5-27.


Comment on Proposal No: 5-57

Recommendation: Accept in Principle the proposal. Change the definition to read as follows:

Ground Fault. An unintentional, electrically conducting connection between an ungrounded conductor of an electrical circuit and the grounded conductor or normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment or earth.

Substantiation: In the National Electrical Code, calling the connection between the normally, current-carrying, grounded, unbalanced current return path and the not-normally, current-carrying, equipment grounding, grounding conductor path with a reason for the connection in the industry and a conflict within the National Electrical Code as it discusses prescriptive requirements for ground-fault protection in 230.95, 215.10, 240.13, 517.17 and Part IV and Part V of Article 517. This conflict will also cause confusion and conflict with the National Electrical Code and the Codes and Standards of the Institute of Electrical and Electronic Engineers (IEEE). One such standard is ANSI/IEEE Std 242 – 2001, Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems termed the “Buff Book”. This reference sets the standard for fault current calculation and system protection and the proper selection, application, and coordination of components that may be required to protect industrial and commercial power systems against abnormalities that could reasonably be expected to occur in the course of electrical system operation.

Other IEEE Standards such as the ANSI/IEEE Std 141-1993, IEEE Recommended Practice for Electric Power Distribution for Industrial Plants and the ANSI/IEEE Std 241-1990, IEEE Recommended Practice for Electric Power Distribution for Industrial Buildings should have appropriate sections on ground fault currents. Also, the Bussman, Electrical Protection Handbook discusses and uses the methodologies developed in ANSI/IEEE Std 242 to discuss and recommend overcurrent protection as well as protection from ground faults in accordance with the requirements of the National Electrical Code.

The principle issue in Proposal 5-57 is the use of the phrase “a normally current carrying conductor” in the definition developed by CMP-5 in the Recommendation portion of the comment.

Many times “a normally current carrying conductor” is an ungrounded conductor (typically referred as a line conductor or a phase conductor). However, a grounded conductor or a neutral conductor is also “a normally current carrying conductor”. Connection of a grounded conductor or a neutral conductor of an electric circuit and the normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment or earth is a ground fault. Rather the term for this connection is not currently defined in any standard. Defining a grounded conductor or neutral conductor connection to the ground or non-current carrying grounded metal members goes against the history of the term as it is used in calculating the magnitude and phase angle of unbalanced currents during accidental connection of single-line to ground short-circuits or double-line to ground short-circuits.

The history of the term “ground fault” and ground fault current calculations dates back to 1926 when A. P. Mackerras used a mathematical method previously developed by Dr. C. L. Fortescue (later called Symmetrical Components) to establish and publish his work on the determination of single-phase short-circuits on three-phase systems. Unbalanced (unsymmetrical) currents during a single-phase, line-to-ground, short-circuit (termed ground fault) in a three-phase system using the symmetrical method consisting of currents down into three, symmetrical currents to ease the complex circuit calculations. These three symmetrical models of the unsymmetrical current, voltage or impedance are the positive-sequence component, the negative-sequence component and the zero-sequence component.

In order to use the theory of symmetrical components on three-phase systems (that is now widely accepted as a standard practice) with Ohms law for AC systems, 

\[ I = \frac{E}{Z} \]

voltages (E) and circuit impedances (Z) are broken down into their respective symmetrical sequence components.

Calculations are made at the symmetrical sequence component level and reconstructed back to the unsymmetrical level for an answer to determine the magnitude and phase angle of current. Single-phase systems are much simpler to calculate a shorted phase to ground or shorted phase to neutral current.

In a three-phase wiring system, both the positive-sequence component and the negative-sequence component impedance are based on the resistance (wire resistance) and reactance (geometry) of the individual phase or line conductors. The zero-sequence component impedance is based on the resistance and reactance of the common return path. This work pre-dates the work of Eustace C. Soares and the equipment-grounding conductor philosophy currently found in the National Electrical Code (separate grounded conductor and equipment grounding conductor generally beyond the main disconnecting means in the NEC wired system).

It is interesting to note that the concept of defining Ground Fault and Short Circuit is not a new concept. It was recommended in 1966 by Eustace Soares himself to end the confusion between the definition of a short circuit and a ground fault. He proposed the following two definitions.

SHORT CIRCUIT: A conducting connection, whether intentional or accidental, between any of the conductors of electrical system whether it be from line to line or to the grounded conductor.

GROUND FAULT: A conducting connection, whether intentional or accidental between any of the conductors of an electrical system and the conducting material which encloses the conductors or any conducting material that is grounded or that may become grounded.

Here is the reason why these definitions were not accepted in the past. In the NEC system, both the grounded conductor path (usually a wire or busbar) and the equipment-grounding conductor path (generally, a wire, a metallic raceway or metallic conductor enclosure) are part of the zero-sequence component impedance. Connecting these two conducting paths (grounded path and grounding path) together does not constitute a fault and will not cause a high current to flow in the system. Rather, connecting these two together roughly relates to paralleling two impedances together and reducing the overall impedances. It is therefore recommended a proposal that defines the term “ground fault” as a fault and does not cause a high current to flow in the system.

Connecting the grounded conductor to the equipment-grounding conductor path will cause normal unbalanced load current to flow on non-normally current carrying metallic raceways, metallic enclosures and other metallic path such as building steel, pipe, metallic supports, etc. This current flow outside of the normal conductor path is generally undesired (but not necessarily unsafe) in premises wiring installed in accordance with the National Electrical Code.

The proposed definition in 5-57 falls apart in service enclosures, enclosures such as meter sockets prior to the main disconnecting means, and metallic service raceways. If the bare grounded conductor comes in contact with one of these enclosures, is it a ground fault or a short circuit or just a normal occurrence provided it was intentional? What happens if an electrician unintentionally makes an inappropriate connection or re-grounds the grounded conductor in a feeder supplied panel board? Does an erroneously made, intentional connection vitiate the proposed definition of ground fault in 5-57?

The proposed definition of “ground fault” is approved as it appears in Proposal 5-57 of the NOP, the National Electrical Code will now permit ground faults as the normal occurrences with the connection of the main bonding jumper at the service, the system bonding jumper at a separately derived system, or the connections as permitted in 250.32 (B).

I would agree that a term that describes the inappropriate grounding connection (grounding error) between a grounded conductor and the equipment grounding conductor path beyond the main disconnecting means should be proposed. However, the term “ground fault” is not currently defined in any standard. The revised wording of the definition shown below in this comment accurately defines the term “ground fault”.

Ground Fault. An unintentional, electrically conducting connection between an ungrounded conductor or a metallic enclosure and the grounded conductor or normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment or earth.

Further, if this definition of ground fault is accepted, the definition of short circuit could be defined as follows in a future edition of the NEC.

Short Circuit. An unintentional, electrically conducting connection between two or three ungrounded conductors of an electrical circuit.

References:


Bussmann Electrical Protection Handbook, Copyrighted October 1996, Cooper Industries, Bussmann Division. USA.


Panel Meeting Action: Accept in Principle the proposal. Change the definition to:

Recommendation: Accept in Principle the proposal. Change the definition to:

Final Action: Hold

I would agree that a term that describes the inappropriate grounding connection (grounding error) between a grounded conductor and the equipment grounding conductor path beyond the main disconnecting means should be proposed. However, the term “ground fault” is not currently defined in any standard. The revised wording of the definition shown below in this comment accurately defines the term “ground fault”.

Ground Fault. An unintentional, electrically conducting connection between an ungrounded conductor or a metallic enclosure and the grounded conductor or normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment or earth.

Further, if this definition of ground fault is accepted, the definition of short circuit could be defined as follows in a future edition of the NEC.
REPORT ON COMMENTS A2007 — COPYRIGHT, NFPA

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

WHITE, C.: This comment should have been accepted. The submitter provided a sound argument that the proposed definition of a Ground Fault is technically incorrect. And, he proposed the following more technically correct definition:

Ground Fault. An unintentional, electrically conducting connection between an ungrounded conductor of an electrical circuit and the grounded conductor or normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment or earth.

According to the definition of “Ground-Fault Protection Equipment” in Article 100, the intent is to provide protection of equipment from damaging line-to-ground fault currents. This protection is provided at current levels less than those required to protect conductors from damage through the operation of a supply circuit overcurrent device. As pointed out by the submitter, when the neutral or grounded conductor comes in contact with the equipment-grounding conductor path, normal unbalanced load current will begin to flow on non-normally current carrying metallic raceways, metallic enclosures and other metallic paths such as building steel, plumbing, metallic support structures, etc. This current flow outside of the normal conductor path is generally undesired but it is not damaging. It is not an overcurrent and it is not a ground fault. By accepting this new definition of fault current, will we now ask “Ground Fault Protection Equipment” to trip for the current levels caused by the grounded conductor coming into contact with the equipment grounding conductor path? Obviously not? And, if not, why would that connection be included in the definition of “Ground Fault”?

5-29 Log #2063 NEC-P05 Final Action: Accept in Principle

Submitter: Phil Simmons, Simmons Electrical Services

Comment on Proposal No: 5-51

Recommendation: Accept the Proposal.

Substantiation: The substantiation for the Proposal is persuasive. The term “reliable” is more correct then “permanent” when describing the effective ground-fault current path.

CMP-5 in its substantiation for Panel Proposal 5-224a on 250.97 Exception states: “The phrase “…reliable bonding connection” is the preferred requirement.” A similar wording should be used in this section.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 5-28.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-30 Log #2064 NEC-P05 Final Action: Accept (Figure 250.4)

TCC Action: The Technical Correlating Committee advises that article scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee accepts the panel action.


Comment on Proposal No: 5-61

Recommendation: Move Figure 250.4 to become Figure 250.1.

Substantiation: Figure 250.4 gives the organization of Article 250. As such, it should be located with Section 250.1 which gives the scope of Article 250. Other Articles having similar organization charts locate them with the Article scope. See 220.1 and 430.1 for examples.

Panel Meeting Action: Accept in Principle

Move the FPN to 250.1 and revise as follows:

“FPN: See Figure 250.4-250.1 for information on the organization of Article 250 covering grounding and bonding requirements.”

Remunerate the present Figure 250.4 as Figure 250.1.

Panel Statement: Editorial revisions were made for consistency with the new location of the table.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-31 Log #1520 NEC-P05 Final Action: Accept (250.4(A)(1))

TCC Action: The Technical Correlating Committee directs that this comment be reported as “Accept” since the text of the Fine Print Note accepted in the panel action contains a recommendation and is not in compliance with 3.1.3 of the NEC Style Manual. The text of the comment as submitted is informational and, as such, is in compliance with the NEC Style Manual.


Comment on Proposal No: 5-89

Recommendation: Convert the proposed text into a new FPN located after 250.4(A)(1) as follows:

An important consideration for limiting the imposed voltage is the routing of bonding and grounding conductors so that they are not any longer than necessary to complete the connection without disturbing the permanent parts of the installation and so that unnecessary bends and loops are avoided.

Substantiation: The comment revises the original proposal into an FPN as suggested by the Panel Statement. This information is important and needs to be in the NEC.

Panel Meeting Action: Accept in Principle

Add a new FPN after 250.4(A)(1) as follows:

FPN: An important consideration for limiting the imposed voltage is the routing of bonding and grounding conductors so that they are not any longer than necessary to complete the connection without disturbing the permanent parts of the installation. Unnecessary bends and loops should be avoided.

Panel Statement: The revised text provides good guidance and consideration to users of the NEC.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-32 Log #278 NEC-P05 Final Action: Reject (250.4(A)(5))

Submitter: Steve Byers, Scott Industrial Systems

Comment on Proposal No: 5-66

Recommendation: Vague - “permanent-low-impedance”. Is an enclosure door continuous hinge considered a permanent low-impedance path to ground?

Require enclosure manufacturers to install ground stud on enclosure doors capable of having electrical devices mounted on the door.

Substantiation: Somewhat expensive enclosures are being manufactured without door ground studs. NFPA 79-2003 Section 8.2.3.6.1 states if devices are mounted on conductive doors, a bonding jumper shall be installed. Since I can find no code that requires a stud be welded on the door, how can this be accomplished without compromising the NEMA rating.

70-122
Panel Meeting Action: Reject
Panel Statement: This comment does not comply with 4.4.5(c) of the NEC Regulations Governing Committee Projects in that it does not provide text of the comment, including the wording to be added, revised (and how revised), or deleted.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-33 Log #1017 NEC-P05 Final Action: Accept in Principle (250.4(A)(5))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-65
Recommendation: In line 4, replace “permanent” with “durable” so as to read:
(5) Effective Ground-Fault Current Path. Electrical equipment and wiring and other electrically conductive material likely to become energized shall be installed in a manner that creates a permanent, durable low-impedance circuit...
Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by special definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on “Hey, Bud, you should know what they intend here” translation. I don’t know how commonly inexpert inspectors make the sort of mistake Mr. Schwam is trying to head off, but I do know that AHJs often rely on inadequately trained inspectors. For this reason, the Style Manual’s blessing on terms that have become accepted warrants sparing use. The CMP does have a point, that while the change in the original proposal to remove the sense of “permanent” as meaning “not subject to removal” is worthwhile, “reliable” is a term that is particularly difficult to pin down. I propose “durable,” a term used elsewhere in the NEC for similar purposes, as better conveying the intent. We understand a plug-in under cabinet light that is not double-insulated as a point on an electrical system potentially part of a ground fault current path, whose ground prong should make a durable or reliable grounding connection. However, a separable connection definitely can be viewed as not being permanent.
Panel Meeting Action: Accept in Principle
The panel action is to remove the word “permanent” and revise Section 250.4(A)(5) as follows:
(5) Effective Ground-Fault Current Path. Electrical equipment and wiring and other electrically conductive material likely to become energized shall be installed in a manner that creates a permanent, low-impedance circuit facilitating the operation of the overcurrent device or ground detector for high-impedance grounded systems. It shall be capable of safely carrying the maximum ground-fault current likely to be imposed on it from any point on the wiring system where a ground fault may occur to the electrical supply source. The earth shall not be considered as an effective ground-fault current path.
Panel Statement: The panel agrees with the concept of removing the word “permanent” from this section and does not agree that the proposed replacement word “durable” is necessary for this section. Removing the word “permanent” addresses the concerns of the submitter, and not replacing it with any other descriptive word addresses the other concerns of subjectivity, ambiguity, enforceability, and inconsistent application of the provisions of this section by users of the Code. The panel concludes that the descriptive wording provides the performance language necessary for users without the use of the word “permanent” or any other descriptive adjective. The panel also affirms that the action to remove the word “permanent” is consistent with similar revisions in NEC where the same concerns were raised about the use of this word.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-34 Log #2065 NEC-P05 Final Action: Accept in Principle (250.4(A)(5))

Submitter: Phil Simmons, Simmons Electrical Services
Comment on Proposal No: 5-65
Recommendation: Accept the Proposal.
Substantiation: The substantiation for the Proposal is persuasive. The term “reliable” is more correct then “permanent” when describing the effective ground-fault current path.
CMP-5, in its substantiation for Panel Proposal 5-224a on 250.97 Exceptions states, “The phrase ‘...reliable bonding connection’ is the preferred requirement.” A similar wording should be used in this section.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 5-33.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-35 Log #1018 NEC-P05 Final Action: Accept in Principle (250.4(B)(2))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-67
Recommendation: Revise text to read as follows:
...permanent durable low-impedance path for ground-fault current...
Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by special definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on “Hey, Bud, you should know what they intend here” translation. I don’t know how commonly inexpert inspectors make the sort of mistake Mr. Schwam is trying to head off, but I do know that AHJs often rely on inadequately trained inspectors. For this reason, the Style Manual’s blessing on terms that have become accepted warrants sparing use. The CMP does have a point, that while the change in the original proposal to remove the sense of “permanent” as meaning “not subject to removal” is worthwhile, “reliable” is a term that is particularly difficult to pin down. I propose “durable,” a term that is used elsewhere in the NEC for similar purposes, as better conveying the intent. We understand a plug-in under cabinet light that is not double-insulated as normally non-current-carrying conductive equipment enclosing electrical conductors. Its ground prong should make a durable or reliable grounding connection. However, a separable connection definitely can be viewed as not being a permanent bond.
Panel Meeting Action: Accept in Principle
The panel action is to remove the word “permanent” and revise Section 250.4(B)(2) as follows:
(2) Bonding of Electrical Equipment. Non-current-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected together and to the supply system grounded equipment in a manner that creates a permanent low-impedance path for ground-fault current that is capable of carrying the maximum fault current likely to be imposed on it.
Panel Statement: The panel agrees with the concept of removing the word “permanent” from this section and does not agree that the proposed replacement word “durable” is necessary for this section. Removing the word “permanent” addresses the concerns of the submitter, and not replacing it with any other descriptive word addresses the other concerns of subjectivity, ambiguity, enforceability, and inconsistent application of the provisions of this section by users of the Code. The panel concludes that the descriptive wording provides the performance language necessary for users without the use of the word “permanent” or any other descriptive adjective. The panel also affirms that this action to remove the word “permanent” is consistent with similar revisions in NEC where the same concerns were raised about the use of this word.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-36 Log #2066 NEC-P05 Final Action: Accept in Principle (250.4(B)(2))
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 5-70
Recommendation: Revise text to read as follows:
...a manner that creates a permanent, durable low-impedance path for ground-fault current.

Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by special definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on “Hey, Bud, you should know what they intend here” translation. I don’t know how common inexpert inspectors make the sort of mistake Mr. Schwanz is trying to head off, but I do know that AHJs often rely on inadequately trained inspectors. For this reason, the Style Manual’s blessing on terms that have become accepted warrants sparing use. The CMP does have a point, that while the change in the original proposal to remove the sense of “permanent” as meaning “not subject to removal” is worthwhile, “reliable” is a term that is particularly difficult to pin down. I propose “durable,” a term used elsewhere in the NEC for similar purposes, as better conveying the intent. We understand a plug-in under cabinet light that is not double-insulated as an example of equipment and electrically conductive materials that are likely to become energized. Its ground prong should make a durable or reliable grounding connection. However, a separable connection definitely can be viewed as not being a permanent bond.

Panel Meeting Action: Accept in Principle

The panel action is to remove the word “permanent” and revise Section 250.4(B)(3) as follows:

(3) Bonding of Electrically Conductive Materials and Other Equipment.
Electrically conductive materials that are likely to become energized shall be connected together and to the supply system grounded equipment in a manner that creates a permanent low-impedance path for ground-fault current that is capable of carrying the maximum fault current likely to be imposed on it.

Panel Statement: The panel agrees with the concept of removing the word “permanent” from this section and does not agree that the proposed replacement word “durable” is necessary for this section. Removing the word “permanent” addresses the concerns of the submitter, and not replacing it with any other descriptive word addresses the other concerns of subjectivity, ambiguity, enforceability, and inconsistent application of the provisions of this section by users of the Code. The panel concludes that the descriptive wording provides the performance language necessary for users without the use of the word “permanent” or any other descriptive adjective. The panel also affirms that the action to remove the word “permanent” is consistent with similar revisions in NEC where the same concerns were raised about the use of this word.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-38 Log #2067 NEC-P05 Final Action: Accept in Principle (250.4(B)(3))

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation: Accept the Proposal.

Substantiation: The substantiation for the Proposal is persuasive. The term “reliable” is more correct than “permanent” when describing the low-impedance path for fault current.

CMP-5, in its substantiation for Panel Proposal 5-224a on 250.97 Exceptions states, “The phrase “...reliable bonding connection” is the preferred requirement.” A similar wording should be used in this section.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 5-37.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-39 Log #600 NEC-P05 Final Action: Reject (250.4(B)(4))


Comment on Proposal No: 5-71
Recommendation: We suggest the proposal be Accepted as originally proposed because the second fault is a phase to phase fault and not a ground fault.

Substantiation: None given.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms the action on Proposal 5-71, and Proposal 5-69 clarifies that the overcurrent device operates when a second phase to ground fault occurs on a different ungrounded phase conductors supplied by the system. FPN No. 1 provides users with the information and clarification necessary for users and indicates that the second phase fault to ground is a ground fault condition, in addition to becoming a phase-to-phase short-circuit condition. The panel action on Proposal 5-69 addresses the concerns of the submitter.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-40 Log #1020 NEC-P05 Final Action: Accept in Principle (250.4(B)(4))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 5-70
Recommendation: Revise text to read as follows:
...a manner that creates a permanent, durable low-impedance path for ground-fault current.

Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by special definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on “Hey, Bud, you should know what they intend here” translation. I don’t know how common inexpert inspectors make the sort of mistake Mr. Schwanz is trying to head off, but I do know that AHJs often rely on inadequately trained inspectors. For this reason, the Style Manual’s blessing on terms that have become accepted warrants sparing use. The CMP does have a point, that while the change in the original proposal to remove the sense of “permanent” as meaning “not subject to removal” is worthwhile, “reliable” is a term that is particularly difficult to pin down. I propose “durable,” a term used elsewhere in the NEC for similar purposes, as better conveying the intent. We understand a plug-in under cabinet light that is not double-insulated as an example of equipment and electrically conductive materials that are likely to become energized. It’s ground prong should make a durable or reliable grounding connection. However, a separable connection definitely can be viewed as not being a permanent bond.

Panel Meeting Action: Accept in Principle

The panel action is to remove the word “permanent” and revise Section 250.4(B)(4) as follows:

(4) Path for Fault Current. Electrical equipment, wiring, and other electrically conductive material likely to become energized shall be installed in a manner that creates a permanent, low-impedance circuit from any point on the wiring system to the electrical supply source to facilitate the operation of overcurrent devices should a second fault occur on the wiring system. The earth shall not be considered as an effective fault-current path.

Panel Statement: The panel agrees with the concept of removing the word “permanent” from this section and does not agree that the proposed replacement word “durable” is necessary for this section. Removing the word “permanent” addresses the concerns of the submitter, and not replacing it with any other descriptive word addresses the other concerns of subjectivity, ambiguity, enforceability, and inconsistent application of the provisions of this section by users of the Code. The panel concludes that the descriptive wording provides the performance language necessary for users without the use of the word “permanent” or any other descriptive adjective. The panel also affirms that this action to remove the word “permanent” is consistent with similar revisions in NEC where the same concerns were raised about the use of this word.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-41 Log #1021 NEC-P05 Final Action: Accept (250.4(B)(4))

5-42 Log #2068 NEC-P05 Final Action: Accept in Principle (250.4(B)(4))

Submitter: Phil Simmons, Simmons Electrical Services

Comment onProposal No: 5-69
Recommendation: Accept the Proposal.

Substantiation: Typo.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 5-40.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Proposal on Comment No: 5-61

Recommendation: Continue to accept the TCC Grounding and Bonding Task Group proposal 5-61 as modified by the actions of CMP-5.

Substantiation: The Technical Correlating Committee Task Group on Grounding and Bonding agrees with the action of CMP-5 on Proposal 5-61. The CMP-5 revisions to the proposal have been made for clarity and continue to be consistent with the Task Group’s original initiatives.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group included: C. Douglas White; Michael Jakubek; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-44 Log #2249 NEC-P05  Final Action: Accept (250.8)

Submitter: Donald A. Ganiere, Ottawa, IL

Proposal on Comment No: 5-84

Recommendation: Continue to accept in principle.

Substantiation: The original submitted wording would have prohibited the use of standard pressure connectors (wire nuts) for use with EGs, and would have required the use of “green” wire nuts for this purpose. The panel should continue to accept its revised wording as the revised wording makes it very clear that any listed pressure connector can be used for the connection of EGCs.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-45 Log #1023 NEC-P05  Final Action: Reject (250.8(A)(5) and (6))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Proposal on Comment No: 5-84

Recommendation: Revise text to read as follows:

(5) Machine screw-type fasteners that engage not less than two threads or are secured with a nut, with a washer inserted between the fastener’s head and the conductor, where necessitated by the size or shape of the head.

(6) Thread-forming machine screws that engage not less than two threads in the enclosure, with a washer inserted between the fastener’s head and the conductor, where necessitated by the size or shape of the head.

Substantiation: We were advised at the UL session of the 2006 Eastern Section, JAE meeting that grounding screws are not listed items. However, any screw that engages the two or more threads and grabs the conductor under its head should be as acceptable as the green screws sold for the purpose. As such, a screw or fastener is not required to be tested as an element of a Listed system, it would be well to put installers on notice that when the conductor would not be held securely by its head, it would need to be augmented. This also would take into account a recommendation in Proposal 5-85 that was not addressed by the CMP.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original actions on Proposal 5-85 addressing the term “sheet metal screws” as previously used in that section and provided the needed clarification regarding the acceptable means of making grounding and bonding connections. Accessory features are currently provided by equipment manufacturers that do not include any washers as mentioned in this comment. Providing no specific size or head shape would make this additional language difficult to apply.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-46 Log #1847 NEC-P05  Final Action: Reject (250.14 (New))

Submitter: Mike Holt, Mike Holt Enterprises, Inc.

Proposal on Comment No: 5-90

Recommendation: This proposal should be Rejected.

Substantiation: This proposal should be rejected for a few different reasons:

1. The substantiation seems to imply that an unsafe condition would exist should a person remove the termination from the enclosure. While this is true, the code can’t protect against persons changing the electrical installation.

2. The proposal seems to be concerned about the metal enclosure carrying neutral current. If the enclosure is in fact listed to carry neutral current, then it has been tested, evaluated and listed for such use, indicating that it is in fact safe. If the product is not listed for such an application, the installation is illegal via 110.3(B). Perhaps this concern would be better addressed by the product changing the product standard instead of the Code.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original actions on Proposal 5-90. It is recognized that this new requirement is addressed in the listing information of the equipment as is the other equipment that is listed as suitable for use as service equipment that is installed to meet the requirements in 250.24. See the panel actions on Comment 5-47.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-47 Log #1906 NEC-P05  Final Action: Accept (250.14 (New) )

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Proposal on Comment No: 5-90

Recommendation: Accept the proposal in principle. Locate the text in 200.2 as a lettered paragraph.

Substantiation: The panel reaffirms its current actions on Proposal 5-90 as a lettered paragraph.

Panel Meeting Action: Accept
Panel Statement: The action on this comment does not add a new 250.14 but rather relocates the recommendation to 200.2.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-48 Log #2070 NEC-P05  Final Action: Reject (250.14 (New))

Submitter: Chuck Mello, Underwriters Laboratories

Proposal on Comment No: 5-90

Recommendation: The text should be relocated to an appropriate section in Article 300, such as under 300.3, under wiring methods that addresses the general installation of circuit conductors.

Substantiation: Panel 5 should have rejected this proposal. The intent is correct but the requirements are in the wrong Article. The grounded conductor is permitted or required to be connected to the grounding system under specific conditions in Article 250 so as to provide for the grounded conductor to also serve as an equipment grounding function or to establish which conductor is the grounded conductor for a system. The example of the main bonding jumper being called a “grounded conductor” is a clear misapplication of terms and creates confusion. The connection of the grounded conductor in and out of any enclosure must be on a suitable conductor, as indicated in the proposal’s substantiation, and not use the metal enclosure for the current carrying path.

The TCC should correlate this to the correct location since panel 5 is not the correct panel to establish wiring methods for connection of the grounded conductor.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original actions on Proposal 5-90. It is recognized that this new requirement is addressed in the listing information of equipment as is the other equipment that is listed as suitable for use as service equipment that is installed to meet the requirements in 250.24. See the panel action on Comment 5-47.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-49 Log #604 NEC-P05 Final Action: Accept in Principle
(250.21 Exception)

TCC Action: The Technical Correlating Committee directs that the text be rewritten as follows to be in compliance with 3.3.3 of the NEC Style Manual in expressing limits.

“(B) Ground Detectors. Ungrounded alternating current systems as permitted in 250.21(A)(1) through (A)(4) operating at not less than 120 volts and not exceeding 1000 volts shall have ground detectors installed on the system.”

Submitter: Jamie McNamara, Hastings, MN
Comment on Proposal No: 5-97
Recommendation: Revise as follows:
250.21 Exception: Systems of less than 120 volts to ground shall have ground detectors installed as permitted by this Code shall not be required to have ground detectors.

Substantiation: The panel was correct in rejecting the original proposed text. The panel should reconsider the clarified text, requirement for nongrounded systems. In a nongrounded system, theoretically, there are zero volts to ground and an installer could be misled in applying the exception. (Into thinking for example a 480 volt ungrounded system that measured less than 120 volts to ground with a meter would not require ground detectors). I thank the panel for the very clear panel statement as to the intent of the exception and how it is to be applied.

Panel Meeting Action: Accept in Principle
Revise the text of 2008 NEC Draft Section 250.21(B) to read as follows:
(B) Ground Detectors. Ungrounded alternating current systems as permitted in 250.21(A)(1) through (A)(4) operating from #120 volts to 1000 volts to ground shall have ground detectors installed on the system.

Panel Statement: Only systems less than 120 volts nominal are permitted to ground phase-to-phase as permitted by this Code shall not be required to have ground detectors.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative:
BOKSINER, J.: The new language might not comply with the NEC Style Manual with respect to expression of limits. Alternative language could be as follows:

(B) Ground Detectors. Ungrounded alternating current systems as permitted in 250.21(A)(1) through (A)(4) operating at not less than 120 volts to and not exceeding 1000 volts to ground shall have ground detectors installed on the system.

5-50 Log #2075 NEC-P05 Final Action: Accept in Principle
(250.24(C))

Submitter: Chuck Mello, Underwriters Laboratories

Comment on Proposal No: 5-76
Recommendation: Revise the proposed text to read as follows:
250.24(C)

(C) Ground Conductor Brought to Service Equipment. Where an ac system operating at less than 1000 volts is grounded at any point, the grounded conductor(s) shall be run to each service disconnecting means and shall be connected to each disconnecting means ground conductor(s) terminal or bus. A main bonding jumper shall connect the ground conductor(s) to each service disconnecting means enclosure. The grounded conductor(s) shall be installed in accordance with 250.24(C)(1) through (C)(3).

Exception: Where more than one service disconnecting means are located in an assembly, the assembly list for use as service equipment, it shall be permitted to run the grounded conductor(s) to the assembly common ground conductor(s) terminal or bus. The assembly shall have a main bonding jumper for connecting the grounded conductor(s) and the conductor(s) shall be connected to the assembly enclosure.

Substantiation: The revised text as acted on the by the panel would literally require the ground circuit circuit to be connected to the service disconnecting means enclosure. This could easily be interpreted as being "directly" connected which is not a proper installation. The proper termination point for the service conductor is to the grounded conductor terminal or bus intended and identified for the termination of this conductor. The main bonding jumper is in fact the conductor that connects the service grounded conductor terminal or bus to the service equipment enclosure (green screw, strap, bus, or wire type MBJ). Similarly in the exception, the grounded conductor would appear to be required to be connected to the assembly enclosure and not to the service grounded conductor terminal(s) or bus provided for that purpose. The grounded conductor is to be connected to that terminal or bus and the main bonding jumper then connects that terminal or bus to the assembly enclosure. Under the definition in the 2005 code using the word “bonded” allowed the correct installation of terminating on the lug or bus, but then some mean of “bonding” of this terminal or bus was provided.

Panel Meeting Action: Accept in Principle
Change the word “have” in the last sentence of the exception to the word “include.” Accept the rest of the comment as an editorial revision to the work in Proposal 5-76.

Panel Statement: Editorial revision to Proposal 5-76.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative:

MELLO, C.: The panel statement is not correct that this was an editorial change to proposal 5-76. The text changes shown in the comment and accepted by the panel were more than editorial and corrected a deficiency created by the action on proposal 5-76.

5-51 Log #467 NEC-P05 Final Action: Reject
(250.24(E))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 5-104
Recommendation: Accept proposal revised:
The grounding electrode conductor shall be connected to a non-flexible metal enclosure of the service conductors suitable for use as a grounding conductor at any accessible...remainder unchanged.

Substantiation: Method (15) permits flexible metal conduit or liquidtight flexible metal conduit suitable for a ground clamp connection. Although a bonding connector with a lug on a bonding jumper could be used for a connection point, it is a fitting not an enclosure.

Panel Meeting Action: Reject
Panel Statement: Use of the term "nonflexible" is not appropriate for enclosures that are applicable for this section.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

(Note: The sequence no. 5-52 was not used)

5-53 Log #1758 NEC-P05 Final Action: Accept
(250.28(D))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.

Comment on Proposal No: 5-107
Recommendation: Add titles to each of (1) through (3) to comply with the NEC Style Manual, such as:

(1) General. (2) Main Bonding Jumper for Service With More Than One Enclosure (3) Separately Derived System With More Than One Enclosure.

250.28 Main Bonding Jumper and System Bonding Jumper

(D) Size. Main bonding jumpers and system bonding jumpers shall be sized in accordance with 250.28(D)(1) through (D)(3).

(1) General Main bonding jumpers and system bonding jumpers shall not be smaller than the sizes shown in Table 250.66. Where the supply conductors are larger than 1100 kcmil copper or 1750 kcmil aluminum, the bonding jumper shall have an area that is not less than 2 1/2 percent of the area so the largest phase conductor except that, where the phase conductors and the bonding jumper are of different materials (copper or aluminum), the minimum size of the bonding jumper shall be based on the assumed use of phase conductors of the same material as the bonding jumper and with an ampacity equivalent to the installed phase conductors.

(2) Main Bonding Jumper for Service With More Than One Enclosure.

Where a service consists of more than a single enclosure as permitted in 230.71(A), the main bonding jumper for each enclosure shall be sized in accordance with 250.28(D)(1) based on the largest ungrounded service conductor serving that enclosure.

(3) Separately Derived System With More Than One Enclosure. Where a separately derived system supplies more than a single enclosure, the system bonding jumper for each enclosure shall be sized in accordance with 250.28(D)(1) based on the largest ungrounded feeder conductor serving that enclosure or a single system bonding jumper shall be installed at the source and sized in accordance with 250.28(D)(1) based on the equivalent size of the largest supply conductor determined by the largest sum of the areas of the corresponding conductors of each set.

Substantiation: Add titles to each of the (1) through (3) to comply with the NEC Style Manual.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
5-54 Log #1843 NEC-P05
(250.28(D))

Final Action: Reject

Submitter: Mike Holt, Mike Holt Enterprises, Inc.

Comment on Proposal No: 5-107

Recommendation: Accept the Proposal as modified:
1. Proposed text to remain unchanged.
2. Where a service consists of more than a single enclosure as permitted in 230.71(A), the main bonding jumper for each enclosure shall be sized in accordance with 250.28(D)(1) based on the largest ungrounded service conductor serving the enclosure.
3. Where a separately derived system supplies more than a single enclosure, the system bonding jumper for each enclosure shall be sized in accordance with 250.28(D)(1) based on the largest ungrounded service conductor serving that enclosure.

Panel Meeting Action: Reject

Panel Statement:
The suggested revisions in this comment would restrict installation of the system bonding jumper to the source enclosure where multiple enclosures are installed. This restriction is without substantiation and is in conflict with the current provisions of 250.30(A)(1).

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-55 Log #510 NEC-P05
(250.30(A)(4)(a))

Final Action: Reject

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 5-113

Recommendation: Accept the proposal.

Substantiation:
It is not reasonable that a common GEC for two transformers, regardless how small the kVA is required to be 3/0 (copper) even if connected to a ground rod whereas if separately grounded two transformers, regardless how large the kVA if connected to a ground rod the GEC could be 6 AWG copper.

Panel Meeting Action: Reject

Panel Statement:
The panel affirms its actions on this proposal through its actions and statements on Proposal 5-78 and Comment 5-61 in the 2005 NEC cycle. See panel action and statement on Comment 5-61 on page 70-150 of the 2004 NEC Report on Comments publication.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-56 Log #1620 NEC-P05
(250.30(A)(7))

Final Action: Reject

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 5-115

Recommendation: This proposal should have been accepted.

Substantiation:
The panel statement that they reaffirm a previous position is unresponsive to the issue. Contrary to the panel statement, it is not clear that "nearest" applies to the other electrode types, when in fact the wording does not say that. In reality, the other electrode types are not an option under the existing wording unless the building steel and water pipe are "not available." Is far away "not available?" Under the existing wording, a concrete-encased electrode or ground ring or even the busbar permitted by 250.64(C)(3) may be within a few feet, but if the water pipe is 250 ft away, it is available and the water pipe must be used rather than the other electrodes, even though other changes the panel has made support the fact that some of the other electrode types probably provide superior earth connections and are more reliable. The issue in 250.50 is not whether they are available, but whether they exist. It makes no sense to go a long distance for an electrode that the panel has acknowledged is not entirely reliable on its own rather than use a superior electrode that is nearby.

Panel Meeting Action: Reject

Panel Statement:
The panel concludes that the wording of current NEC 250.30(A)(7) already addresses the submitter’s concerns through the wording “as near as practicable and preferably in the same area.” This allows judgment to be applied to address the conditions identified by the submitter rather than resulting in an absolute and impracticable requirement.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-57 Log #1341 NEC-P05
(250.32)

Final Action: Reject

Submitter: Nathan Philips, Integrated Electronic Systems

Comment on Proposal No: 5-119

Recommendation: Reject the proposed change in its entirety.

Substantiation:
The submitter provides no evidence that accidents have resulted from the existing Code language. There are many rural and remote applications where the additional burden imposed by this change would be quite significant, and adequate justification has not been provided. In addition, the proposed change is unenforceable, since buildings and structures aren’t normally inspected following original construction.

Panel Meeting Action: Reject

Panel Statement:
This change as suggested by the submitter would help reduce the number of designs that purposely invite the possibilities of inappropriate neutral-to-ground connections that can and often do happen at a later date. There is no sound engineering basis for allowing neutral current to return through multiple paths because of improper or multiple neutral-to-ground connections at buildings or structures supplied by a feeder or branch circuit. The panel concludes that this requirement is enforceable and has already been adopted by some jurisdictions.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:
TOOMER, R.: Adequate substantiation has not been provided for this major change in the NEC. This provision has been in the NEC for many, many years with no evidence of any problems. We have received only one proposal in over 30 years to make this change, and now we take this action with little regard to the consequences. The fact that the Panel has received no prior Proposals on this issue suggests that it is not a major problem. This comment should have been accepted.

Comment on Affirmative:
JOHNSTON, M.: The submitter indicated that this requirement is not enforceable because buildings normally are not inspected after the original construction. Fortunately this is not true in most parts of the country. The previous codes have allowed two options for grounding and bonding feeders to separate buildings or structures, which have resulted in many misapplications of grounding and bonding. The new requirement of a separate equipment grounding conductor routed to a separate building in this section will provide safer installations by minimizing the conditions that lead to neutral currents returning on multiple paths creating an unsafe installation. It will now be clear on how to ground and bond a feeder to a separate building with no questions whether to bond or not to bond the grounded neutral conductor or the potential problems with future installations of a metallic path ran to the separate building. From the enforcement perspective this will help reduce problems in the field and provide additional safety. Retaining the exception in this section assists users by allowing installations that met the criteria of 250.52(B)(2) to remain operational and built upon in the future as long as the conditions contained with the exception are maintained.

5-58 Log #1518 NEC-P05
(250.32)

Final Action: Accept in Principle

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 5-119

Recommendation: The Panel Action should continue to be Accept in Principle with the following additional changes.

In 250.32 (B), revise the last phrase to read “shall comply with the following requirements.”

Delete the title “(1) Equipment Grounding Conductor” from 250.32(B)(1).

The remainder of the Panel Action is unchanged.

Substantiation:
The Panel Action changed 250.32(B)(2) into an Exception to 250.32(B)(1) so there is now only one section and, therefore, it should not be numbered. It can be a separate paragraph without a title.

The revision to 250.32(B) correlates this change.

Panel Meeting Action: Accept in Principle

Revise 250.32 as follows:

250.32 Buildings or Structures Supplied by a Feeder(s) or Branch Circuit(s).

(A) Remains unchanged.

(B) Grounded Systems. For a grounded system at the separate building or structure, the connection to the grounding electrode and grounding or bonding of equipment, structures, or frames required to be grounded or bonded shall comply with either 250.32(B)(1) or (B)(2).

(4) Equipment Grounding Conductors. Except for equipment grounding conductor as described in 250.118 shall be run with the supply conductors and be connected to the building or structure disconnecting means and to the grounding electrode(s). The equipment grounding conductor shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded.

The equipment grounding conductor shall be installed not connected to the equipment grounding conductor or to the grounding electrode(s).
Exception: For existing premises wiring systems only, new or existing buildings or structures only, the grounded conductor run with the supply to the building or structure shall be permitted to be connected to the building or structure disconnecting means and to the grounding electrode(s) and shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded where all the requirements of (1), (2), and (3) are met:

(1) An equipment grounding conductor is not run with the supply to the building or structure.
(2) There are no continuous metallic paths bonded to the grounding system in each building or structure involved.
(3) Ground-fault protection of equipment has not been installed on the supply side of the feeder(s).

Where the grounded conductor is used for grounding in accordance with the provision of this exception, the size of the grounded conductor shall not be smaller than the larger of the following:

(1) That required by 220.61
(2) That required by 250.122

Panel Statement: The panel incorporates the concepts in this and other comments and makes editorial improvements.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: TOOMER, R.: See my Explanation of Negative Vote on Comment 5-57.

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5-59 Log #1845 NEC-P05 Final Action: Accept in Principle (250.32)

Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 5-119
Recommendation: Continue to Accept in Principle this Proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 5-58.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: TOOMER, R.: See my Explanation of Negative Vote on Comment 5-58.

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5-60 Log #1907 NEC-P05 Final Action: Reject (250.32)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 5-119
Recommendation: Reject the proposal.
Substantiation: This submitter has been consistently supported as CMP 5 steadfastly made the transition to the concept that neutral return current should travel over conductors bought at electrical supply houses. It has previously done so in ways that, until now, allowed electrical designers to choose how to deal with regrounded neutrals as long as neutral current passed over recognized conductors. However, Proposal 5-119 crosses a line that should not be crossed that is, into the territory of attempting to sunset a distribution practice that has been routine for over a century. Furthermore, it is a practice that brings the overwhelming majority of electrical service power to commercial and residential occupancies throughout North America, and that will not be going away within the lifetime of any member of the NEC committee The comparison with 250.140 is not apt, because that was an anomaly occasioned by the Second World War. However, it is also instructive in that it hung on for fifty years. Why? Because no one ever demonstrated any loss experience even though at about all of us (myself included) thought it was bad practice. The proposal substantiation is frankly overwrought. CMP 5 should not take sides in this political controversy.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 5-57.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: TOOMER, R.: See my Explanation of Negative Vote on Comment 5-58.

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5-61 Log #2250 NEC-P05 Final Action: Reject (250.32)

Submitter: Donald A. Ganiere, Ottawa, IL
Comment on Proposal No: 5-119
Recommendation: This proposal should be rejected.
Substantiation: The submitter and the panel are asking the code users to believe that electricity behaves differently on the line side of the service disconnect than does on the load side. Not only are the parallel paths that the submitter says are so hazardous on the load side of the service disconnect permitted on the line side, they are actually even required on the line side in a number of cases. How can these parallel paths be a serious hazard on the load side of the service disconnect and be required on the line side of the same disconnect? What magic takes place at the service disconnect that changes the hazard? Where is the technical justification for the acceptance of this proposal? Where are the reports of accidents or other types of problems that have been caused by the existing rule?
Panel Meeting Action: Reject
Panel Statement: The panel does accept the concept of continuing to migrate away from the use of the grounded circuit conductor for grounding beyond the service. See panel action and statement on Comment 5-57.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: TOOMER, R.: See my Explanation of Negative Vote on Comment 5-57.

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5-62 Log #979 NEC-P05 Final Action: Accept in Principle (250.32(B)(2) Exception)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 5-119
Recommendation: There cannot be a B(1) without a B(2) so this must be revised by deleting (1) and the title and rewording (B) as follows:
250.32 Buildings or Structures Supplied by Feeder(s) or Branch Circuit(s) (B) Grounded Systems. For a grounded system at the separate building or structure, the connection to the grounding electrode and grounding or bonding of equipment, structures, or frames required to be grounded or bonded shall be as follows: comply with either 250.32(B)(1)(1) or (B)(2).

(1) Equipment Grounding Conductor: An equipment grounding conductor as described in 250.118 shall be run with the supply conductors and connected to the building or structure disconnecting means and to the grounding electrode(s). The equipment grounding conductor shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded. The equipment grounding conductor shall be sized in accordance with 250.122. Any installed grounded conductor shall not be connected to the equipment grounding conductor or to the grounding electrode(s).

Exception: For existing premises wiring systems only, new or existing buildings or structures only, the grounded conductor run with the supply to the building or structure shall be permitted to be connected to the building or structure disconnecting means and to the grounding electrode(s) and shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded where all the requirements of (1), (2), and (3) are met:

(1) An equipment grounding conductor is not run with the supply to the building or structure.
(2) There are no continuous metallic paths bonded to the grounding system in each building or structure involved.
(3) Ground-fault protection of equipment has not been installed on the supply side of the feeder(s).

Where the grounded conductor is used for grounding in accordance with the provision of this exception, the size of the grounded conductor shall not be smaller than the larger of the following:

(1) That required by 220.61
(2) That required by 250.122

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 5-58.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: TOOMER, R.: See my Explanation of Negative Vote on Comment 5-58.

70-128
(1) The frame of the generator is bonded to the vehicle frame, and
(2) The generator supplies only equipment located on the vehicle, or cord-

and-plug connected equipment supplied through receptacles, or through single-

polar separable connectors mounted on the vehicle, or both equipment located

on the vehicle and cord-plug-connected equipment, or through single-pole

separable connector receptacles mounted on the vehicle or on the generator,

(3) The non-current carrying metal parts of the equipment and the equipment

grounding conductor terminals of the receptacles are bonded to the generator

frame, and

(4) Where the service provided by the generator supplies equipment that is

located, installed or adjacent to other derived electrical services; the ground of

the generator and that of the other derived system shall be bonded.

Substantiation: While this wording may have originally been written to cover small engine generators or welding/generator machines

installed in work trucks; more recently we find that larger truck mounted or
towed vehicle mounted generators ranging from 5.0 KW (17.5) AMPS at 120

VOLTS to trailer mounted generators in capacities up to 4000 KW (120400)

AMPS at 240 VOLTS. Typically, these generators provide voltages at 120/240

volts or 120/240 volts AC or supply a transformer with voltages suitable to

the service required. Some have a rectifier to provide a 110 Volt DC voltage, but

this requirement, by the motion picture industry, is being phased out as the use

of carbon arc luminaires are obsolete.

Besides construction sites, these generators are commonly used in a number of

entertainment industry applications such as on location motion picture and

television productions, outdoor concerts or theatrical events, carnivals, circuses

and fairs. These generator assemblies will also be found as emergency back-up

power for cell phone towers, other communication installations, emergency

lighting, rescue equipment, etc., during failure of the utility supplied power

such as immediately following an earthquake, or hurricanes.

The question as to whether or not there is a requirement for installing a

ground rod needs to now be clarified. The City of Los Angeles does not require

the installation of a ground rod for motion picture production. However, the

inspector finds that when the same production moves its location to another

jurisdiction they may be required to install a ground rod. Investigation within

the carnivals has found that the requirement of installing a ground rod and its

later removal have created more workers compensation claims due to accidents

in the removal of the rod than any other claims.

At a 2003 Southern California Section meeting of the International

Association of Electrical Inspectors that was chaired by this submitter, the

question of ground rods was discussed. Some AHJs present at the meeting

would accept a “floating ground” while others were adamant that within their

jurisdiction there shall be a ground stake in the ground. The same organization

held another meeting in 2004 where a representative of UL explained that if the

service was cord and plug connected a ground rod was not required.

There was a question as to whether or not the single-pole separable

connectors commonly known as “Cam-Lock” connectors were considered a

“plug”. These devices fall under UL “Receptacles Stage Type” (RUFR) and

UL 1681 Standard. An interpretation by a representative of Underwriters

Laboratories has stated that the single-pole separable connector is defined as a

plug.

Panel Meeting Action: Reject

Panel Statement: The addition of “single-pole separable connectors” is

unnecessary and confusing. The addition of the fourth condition is incorrect

because generators do not meet the definition of Service.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

(5-127)

5-125

Panel Statement: The panel concludes that this is an area where users need to

be advised of requirements in the referenced articles regarding generators that

are sometimes installed in out buildings.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-67 Log #1797 NEC-P05

Final Action: Accept in Principle

(250.35)

(5-128)

Comment on Proposal No: 5-126

Recommendation: Accept the proposal.

Substantiation: Same as proposal. According to the definition of “Grounded” in

Article 100, the generator frame is a conducting body that serves in place of

the earth. Unless the frame is considered grounded, and one conductor is

bonded to the frame there is no ground fault current return path, no grounded

(white) conductor, no equipment grounding conductor (by definition), and

devices with terminals intended for connection to grounded (white) conductors

or grounding conductors cannot be used.

Panel Meeting Action: Reject

Panel Statement: The frame of a generator is not considered to be grounded if

not connected to a grounding electrode, based on the definition of “grounded” as

accepted by CMP-5 and published in the Report on Proposals. In addition,

250.34(D) of the 2005 NEC requires the system conductor required to be

served new or existing buildings or structures only, the grounded conductor run with the

supply to the building or structure shall be permitted to be connected to the

building or structure disconnecting means and to the grounding electrode system

and shall be used for grounding or bonding of equipment, structures or

frames required to be grounded or bonded where all the requirements of (1),

(2), and (3) are met...

(2), and (3) are met...

1) The use of the word “only” twice is confusing especially since this is an exception to the article which means that it already assumes the meaning of “only”.

2) The words “shall be permitted” suggests that they have the option of

bonding the neutral conductor to the structure disconnect enclosure and

grounding electrode system. In the next sentence, the word “shall” assumes that

the same conditions are not an option.

3) The word “system” needs to be added to avoid the interpretation that the neutral needs to be directly run to the grounding electrode.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 5-58.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

TOOMER, R.: See my Explanation of Negative Vote on Comment 5-58.

5-67 Log #1797 NEC-P05

Final Action: Accept in Principle

(250.35)

(5-128)

Comment on Proposal No: 5-126

Recommendation: Accept the proposal.

Substantiation: Same as proposal. According to the definition of “Grounded” in

Article 100, the generator frame is a conducting body that serves in place of

the earth. Unless the frame is considered grounded, and one conductor is

bonded to the frame there is no ground fault current return path, no grounded

(white) conductor, no equipment grounding conductor (by definition), and
devices with terminals intended for connection to grounded (white) conductors

or grounding conductors cannot be used.

Panel Meeting Action: Reject

Panel Statement: The frame of a generator is not considered to be grounded if

not connected to a grounding electrode, based on the definition of “grounded” as

accepted by CMP-5 and published in the Report on Proposals. In addition,

250.34(D) of the 2005 NEC requires the system conductor required to be

served new or existing buildings or structures only, the grounded conductor run with the

supply to the building or structure shall be permitted to be connected to the

building or structure disconnecting means and to the grounding electrode system

and shall be used for grounding or bonding of equipment, structures or

frames required to be grounded or bonded where all the requirements of (1),

(2), and (3) are met...

(2), and (3) are met...

1) The use of the word “only” twice is confusing especially since this is an exception to the article which means that it already assumes the meaning of “only”.

2) The words “shall be permitted” suggests that they have the option of

bonding the neutral conductor to the structure disconnect enclosure and

grounding electrode system. In the next sentence, the word “shall” assumes that

the same conditions are not an option.

3) The word “system” needs to be added to avoid the interpretation that the neutral needs to be directly run to the grounding electrode.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 5-58.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

TOOMER, R.: See my Explanation of Negative Vote on Comment 5-58.
Installing the generator feeder conductors in rigid metal conduit.

The equipment grounding conductor on the load side of each generator.

Non-separately Derived System. Where the generator is not installed as ahead of the overcurrent protection? This is the same case the panel clarified installed units. This is particularly true when large generators are installed in clearly indicates a significant safety problem and also an area where the provision of 250.102(D).

The reference towards using the grounded conductor as the bonding means was also purposely left out as the panel seems to be migrating toward not using the grounded conductor for that purpose. A reference to the use of the grounded conductor could be added if deemed appropriate. The proposed text may need additional work, but hopefully it will provide a benchmark for the panel to develop a clear requirement to address a very real issue.

Panel Meeting Action: Accept in Principle

Revise the 250.35 text from Comment 5-67 to read as follows: 250.35 Permanently Installed Generators. A conductor that provides an effective ground-fault current path shall be installed with the supply conductors from a permanently installed generator(s) to the first disconnecting means(s) in accordance with (A) or (B).

(A) Separately Derived System. Where the generator is installed as a separately derived system, the requirements in 250.30 shall apply.

(B) Non-separately Derived System. Where the generator is not installed as a separately derived system, an equipment bonding jumper shall be installed between the generator equipment grounding terminal and the equipment grounding terminal or bus of the enclosure of supplied disconnecting means(s) in accordance with (1) or (2).

(1) The equipment bonding jumper on the supply side of each generator overcurrent device shall be sized in accordance with 250.102(C) based on the size of the conductors supplied by the generator.

(2) The equipment grounding conductor on the load side of each generator overcurrent device shall be sized in accordance with 250.102(D) based on the rating of the overcurrent device supplied.

Panel Statement: Editorial revisions were made for clarity.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Submitter: Chuck Mello, Underwriters Laboratories
Comment on Proposal No: 5-128
Recommendation: Revise proposed text to read as follows:

250.35 Permanently Installed Generators. A means that provides an effective ground-fault current path shall be installed from a permanently installed generator(s) to the first disconnecting means(s) in accordance with 250.35(A) and (B).

250.35(A) Bonding Means. Where the generator is a separately derived system the requirements in 250.30 shall apply. Where the generator is not a separately derived system, the conductor shall be bonded to the disconnecting means enclosure by one of the following:

(1) Direct metal-to-metal attachment of the disconnecting means enclosure to the generator frame
(2) Installing the generator feeder conductors in rigid metal conduit, intermediate metal conduit, electrical metallic tubing or wireway
(3) Equipment bonding jumper between the generator terminal enclosure and the first disconnecting means enclosure.

250.35(B) Equipment Bonding Jumper Size. Where on the supply side of the generator overcurrent device, the conductor shall be sized in accordance with 250.102(C) based on the size of the derived phase conductors. Where on the load side of the overcurrent device, the conductor shall be sized in accordance with 250.102(D).

Substantiation: The substantiation provided by the submitter for the proposal clearly indicates a significant safety problem and also an area where the NEC is lacking guidance. There are clear requirements for connection of generators that are in fact separately derived systems but there is no discussion on all the connections for non-separately derived systems for permanently installed units. This is particularly true when large generators are installed in parallel to separate paralleling switchgear, which contain both the generator disconnecting means and overcurrent protection. What are the requirements for connecting the generator frame to this switchgear enclosure since it is ahead of the overcurrent protection? This is the same case the panel clarified in the 2002 NEC for separately derived systems with the added equipment bonding jumper between the derived system and the first disconnecting means enclosure. While I agree with the panel’s desire not to create another situation where the system ground conductor is connected to ground again, creating possible parallel paths, the panel should have considered revised language to address the problem. The proposed language above does address this issue and does address the panel’s concern about reconnecting the grounded conductor to ground.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 5-67.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-69 Log #1861 NEC-P05 Final Action: Accept in Principle (250.36)

Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 5-133
Recommendation: Accept the Proposal with the following changes:

250.36 High-Impedance Grounded Neut... Systems. High-impedance grounded neutral systems in which a grounding impedance, usually a resistor, limits the ground-fault current to a low value shall be permitted for 3-phase ac systems of 480 volts to 1000 volts where all the following conditions are met:

(1) Remain unchanged.
(2) Remain unchanged.
(3) Remain unchanged.
(4) Remain unchanged.

High-impedance grounded neutral systems shall comply with the provisions of 250.36(A) through (G).

Neutral conductor be smaller than 8 AWG copper or 8 AWG aluminum or copper-clad aluminum.

System Neutral Connection. The system-neutral conductor shall not be connected to ground except through the grounding impedance.

FPN: Remain unchanged.

Neutral Conductor Bonding. The conductor connecting the neutral point of the transformer or generator to its connection point to the grounding impedance shall be fully insulated.

The neutral conductor shall have an ampacity of not less than the maximum current rating of the grounding impedance. In no case shall the neutral conductor be smaller than 8 AWG copper or 8 AWG aluminum or copper-clad aluminum.

Substantiation: Mr. Mello’s statements at the proposal stage are 100 percent correct. The accepted definition (at the ROP stage) does not include the conductor being described in this Code section. The conductor described here does not carry current under normal conditions... it carries current under fault conditions. A fault is not a normal condition. Whatever you call this conductor it most certainly can’t be called a neutral, if the accepted definition of “neutral” continues to pass in Article 100.

A similar comment is being made to the proposed definition of “neutral conductor” (5-36) that would allow the technical committees to change the proposed definition so that it doesn’t conflict with all of section 250.36. These two comments should be correlated so the discrepancy between this section and the definition does not occur.

Panel Meeting Action: Accept in Principle

Revise 236.36 in the 2008 NEC ROP Draft as follows: 250.36 High-Impedance Grounded Neutral Systems.

High-impedance grounded neutral systems in which a grounding impedance, usually a resistor, limits the ground-fault current to a low value shall be permitted for 3-phase ac systems of 480 volts to 1000 volts where all the following conditions are met:

(1) The conditions of maintenance and supervision ensure that only qualified persons service the installation.
(2) Ground detectors are installed on the system.
(3) Line-to-neutral loads are not served.

High-impedance grounded neutral systems shall comply with the provisions of 250.36(A) through (G).

(A) Grounding Impedance Location. The grounding impedance shall be installed between the grounding electrode conductor and the system neutral point conductor. Where a neutral point conductor is not available, the grounding impedance shall be installed between the grounding electrode conductor and the neutral point derived from a grounding transformer.
(B) Grounded System Neutral Conductor. The grounded system neutral conductor from the neutral point of the transformer or generator to its connection point to the grounding impedance shall be fully insulated. The grounded system neutral conductor shall have an ampacity of not less than the maximum current rating of the grounding impedance. The grounded system neutral conductor shall not be connected to ground except through the grounding impedance. FPN: Remain Unchanged.

(C) System Grounding Neutral Connection. The system neutral conductor shall not be connected to ground except through the grounding impedance. FPN: Remain Unchanged.

(D) Neutral Point to Grounding Impedance Conductor Routing. The conductor connecting the neutral point of the transformer or generator to the grounding impedance shall be permitted to be installed in a separate raceway from the ungrounded conductors. It shall not be required to run this conductor with the phase conductors to the first system disconnecting means or overcurrent device.

5-70 Log #2071 NEC-P05 Final Action: Accept in Principle (250.36(A))
Submitter: Chuck Mello, Underwriters Laboratories
Comment on Proposal No: 5-133
Recommendation: Revise the proposed text to read as follows:
250.36(A) Grounding Impedance Location. The grounding impedance shall be installed between the grounding electrode conductor and the system neutral point. Where a neutral point is not available, the grounding impedance shall be installed between the grounding electrode conductor and the neutral point derived from a grounding transformer.

Substantiation: The panel action should have been to accept in principle. Changing the term “neutral” to “neutral conductor” is incorrect in accordance with the definition of the term “neutral conductor” accepted by the panel. Since this conductor is not expected to carry current, unbalanced or from non-linear loads, under normal conditions, then it cannot be called a neutral conductor. Adding the term “neutral point” is clearer and bypasses the necessity of naming this conductor, which may really be a bonding conductor or another variation of a grounding conductor.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 5-69.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-71 Log #2076 NEC-P05 Final Action: Accept in Principle (250.36(D))
Submitter: Chuck Mello, Underwriters Laboratories
Comment on Proposal No: 5-134
Recommendation: Revise 250.36(D) to read as follows:
Neutral Conductor Routing. The conductor connecting the neutral point of the transformer or generator to the grounding impedance shall be permitted to be installed in a separate raceway. It shall not be required to run this conductor with the phase conductors to the first system disconnecting means or overcurrent device.

Substantiation: In this case, just deleting the term “neutral” from the section title is the best solution. The specific conductor being addressed is clarified by the first part of the first sentence, which states “The conductor connecting the neutral point of the transformer or generator to the grounding impedance”, and does not need any additional label. The term neutral conductor as defined now is to carry current under certain normal conditions and in this application, the only time this conductor has current flow is under ground fault (abnormal) conditions.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 5-69.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-72 Log #1024 NEC-P05 Final Action: Reject (250.50)
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-135
Recommendation: Add between the two sentences presently constituting 250.50:...

5-73 Log #1025 NEC-P05 Final Action: Accept (250.50)
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-136
Recommendation: Reject this proposal.
Substantiation: I agree with Mr. Brender that using the earth as a means of maintaining an equal potential between the piers or foundation elements is undesirable. There is no harm in using encapsulated rebar for all but one section of concrete. If Proposal 5-135 is accepted as I suggested in my comment on that, the installation still will not lose out on having this preferable form of grounding electrode.

Panel Meeting Action: Reject
Panel Statement: The submitter wants the proposal rejected, which was the action of the panel in ROP. The panel continues to reject Proposal 5-135. This substantiation appears to be for Proposal 5-137, which also has a comment from submitter.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-74 Log #1060 NEC-P05 Final Action: Reject (250.50)
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-137
Recommendation: I urge that you do not Accept nor Accept in Principle.
Substantiation: Mr. Brender’s concern should not be overlooked. There is no evidence that builders eliminate all potential concrete-encased electrodes where their bonding is required. I certainly have heard nothing to this effect from AHJs in my area where Ufers are required. Indeed, the hardship of having to bond rebar can be eliminated by using encapsulated rebar, a better system but a more-expensive one! Furthermore, if Mr. Whitehead’s proposal is accepted as I propose rewording it in my comment on Proposal 5-135, we retain the benefit and reduce the risk that concerns Mr. Jones, one usable Ufer will remain.

Panel Meeting Action: Reject
Panel Statement: The permissive language in this proposal would not preclude designer and builders from bonding multiple concrete-encased electrodes together.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: BRENDER, D.: The action on the Proposal to Accept in Principle should be reversed. Where more than one concrete encased electrode exists in the foundation for the building or structure, they should all be bonded together. If this is not done, dangerous voltages can be impressed between metallic portions of the buildings or structures that are connected to grounding electrodes that are not bonded together.

5-75 Log #1009 NEC-P05 Final Action: Reject (250.50)
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 5-138
Recommendation: Continue, in effect, to accept the proposal in principle (even though it was erroneously rejected). The concept of the multiple concrete-encased electrodes only needing a single connection (II of the proposal) has been accepted under Proposal 5-137. The concept of a concrete-encased electrode bonded to a steel column (I of the proposal) appears to have been accepted in the panel action on Proposal 5-148.
For engineered, supervised industrial installations it shall be agreed with the panel that for most commercial or residential installations the NEC isn't a design guide. This is a system served a real safety purpose, then cost wouldn't be an issue. But, in large, as well as costly. If bonding all this rebar to the copper grounding electrode has to be bonded to the copper grounding electrode system. This is impractical according to the words in 250.50 today, all rebar in pile caps, small systems. Adding a cathodic protection system to the rebar has nothing to do covered?

There are indeed methods to minimize or eliminate the possibility of corrosion of the rebar and it’s usually referred to as “cathodic protection” systems. Adding a cathodic protection system to the rebar has nothing to do with bonding methods. Cathodic protection systems can add a great deal of cost to a project when the rebar didn’t need to be bonded to the copper to begin with. When this revision was made in the 2005 Code, (Proposal 5-115 and Comment 5-77) there was no substantiation given as to a history of problems in using copper rods and cable alone for a grounding electrode system.

The other part of the cost issue is the amount of rebar that would need to be bonded. According to the words in 250.50 today, all rebar in pile caps, small pump foundations, i.e., any concrete slab with more the 20 ft of 1/2 in. rebar has to be bonded to the copper grounding electrode system. This is impractical as well as costly. If bonding all this rebar to the copper grounding electrode system served a real safety purpose, then cost wouldn’t be an issue. But, in industrial plants where the specifications typically require less the 5 ohms resistance, bonding all the rebar doesn’t make it a safer installation.

I agree with the panel that for most commercial or residential installations that the rebar should be part of the grounding electrode system. But, in large, engineered, petrochemical plants with a copper rod/cable grounding electrode system this is unnecessary. I’ve modified the text to allow this exception to apply to engineered, industrial installations only.

The Code states in Article 90 that the NEC isn’t a design guide. This is a design issue, not a safety issue. Engineering judgment should prevail in some instances and I believe this is one of them.
To take the most extreme example, Mr. Cartal talks of a college campus, but...
By connecting the structural metal frame to the reinforcing bars of a building or structure that is connected to the earth by either of the following methods:

(1) 3.0 m (10 ft) or more of a single structural metal member in direct contact with the earth or encased in concrete that is in direct contact with the earth or encased in concrete that is in direct contact with the earth and good shielding is required for facilities.

The panel action on Proposal 5-148 addressed the concerns of the submitter by removing the conflict with the water pipe electrode supplement requirements created in the 2005 NEC cycle. The panel retained former (4) as a renumbered (3) to recognize other approved means of establishing a connection to the earth through the metal building frame.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

S-85 Log #1521 NEC-P05 Final Action: Accept (250.52(A)(2))

Comment on Proposal No: 5-148
Recommendation: Modify 250.52(A)(2) resulting from Panel Action on Proposal 5-148 as follows:

(2) Metal Frame of the Building or Structure. The metal frame of the building or structure that is connected to the earth by either of the following methods:

(1) By 3.0 m (10 ft) or more of a single structural metal member in direct contact with the earth or encased in concrete that is in direct contact with the earth or encased in concrete that is in direct contact with the earth and good shielding is required for facilities.

The substantiation in the proposal was related to connections to water pipes and supplemental electrodes. The problem described in the substantiation can be solved completely by removing reference to 250.52(A)(1) in item 2. This comment would restore the permission to consider the metal frame of a building or structure as a grounding electrode if it is connected to a ground ring or made electrodes.

The substantiation in the proposal was related to connections to water pipes and supplemental electrodes. The problem described in the substantiation can be solved completely by removing reference to 250.52(A)(1) in item 2. This comment would restore the permission to consider the metal frame of a building or structure as a grounding electrode if it is connected to a ground ring or made electrodes.

Panel Meeting Action: Accept
Modify 250.52(A)(2) resulting from panel action on Proposal 5-148 as follows:

(2) Metal Frame of the Building or Structure. The metal frame of the building or structure that is connected to the earth by any of the following methods:

(1) By 3.0 m (10 ft) or more of a single structural metal member in direct contact with the earth or encased in concrete that is in direct contact with the earth

(2) By connecting the structural metal frame to the reinforcing bars of a concrete-encased electrode as provided in 250.52(A)(3) or ground as provided in 250.52(A)(4)

(3) By bonding the structural metal frame to one or more of the grounding electrodes as defined in 250.52(A)(5) or (A)(6) that comply with 250.56, or

(4) By other approved means of establishing a connection to earth.

Panel Statement: Only editorial corrections were made to this recommended text.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:
JOHNSTON, M.: The panel action confirms that structural steel that is only grounded to the metal water system should not be considered as a grounding electrode. Metal water systems are required to be supplemented by another electrode to be considered a grounding electrode and should not be allowed to be the only qualifier for structural steel to become a grounding electrode. This was inadvertently incorporated in the 2005 edition in error.

The panel action on Comment 5-85 has not addressed the primary objectives of Proposal 5-148. All grounding electrodes listed in 250.52(A) should meet the criteria in the revised definition of the term grounding electrode in Article 100. This definition, as revised by Proposal 5-14, clearly indicates that grounding electrodes are in direct contact with the earth. The panel actions on Comment 5-148 to restore item (3) contradicts what constitutes a grounding electrode, by definition. A grounding electrode should not require being connected to another electrode to become a grounding electrode. As accepted, this is what item (3) allows.

Information provided in the substantiation to Comment 5-148 indicated a need to introduce additional provision that will recognize interconnected metallic building frames as serving as a conductive path to ground through the electrodes in 250.52(A) to which it is connected. The resulting action on Comment 5-85 and Proposal 5-148 clearly indicate a need for new provisions in the 2011 NEC that will adequately address current industry practices of using structural metal building frames as grounding electrodes, even when they do not qualify as grounding electrodes by definition.

MELLO, C.: The efforts of the TCC Grounding and Bonding Task Group were to clarify terminology and to ensure correct application. This panel action goes against those efforts. There is a clear definition of what a “grounding electrode” is in Article 100 and that is expanded on in 250.52 with specifics. 250.52(A)(2)(1) is clearly a grounding electrode all by itself and historically is what was meant by the old terminology “effectively grounded structural metal”. 250.52(A)(2)(2) in the first part, with the rebar in the support footings connected to the frame, also provides the structural metal columns and interconnecting beams as a grounding electrode unto itself. To now say that something is a grounding electrode because it is connected to something else that really is a grounding electrode is illogical and can create great confusion to installers and AHJs. One of the accepted substantiations to redefine the structural metal electrode in the 2005 cycle was that the bonding of the structural metal to the service as required in 250.104 does not then make the structural metal a grounding electrode. While I agree that the structural metal frame of a building may be the best conductor to get to the grounding electrode, when the structural metal frame is itself not a grounding electrode, the fact is that it is a conductor and to call it a “grounding electrode” is incorrect.

Ballot Results: Rejected

S-86 Log #389 NEC-P05 Final Action: Accept in Principle (250.52(A)(3))

Submitter: James D. Erwin, Celanese Ltd
Comment on Proposal No: 5-152
Recommendation: Accept Proposal 5-152.
Substantiation: Present wording requires concrete-encased electrodes to be located near the bottom of the concrete-encased electrode or footing. There is no technical substantiation for this requirement and it precludes the use of any other type of design without major modification.

Panel Meeting Action: Accept in Principle
(3) Concrete-Encased Electrode. An electrode encased by at least 50 mm (2 in.) of concrete, located horizontally and/or vertically, that is in contact with the bottom of the concrete-encased electrode or footing. This definition is expanded on in 250.52(A)(5) and (A)(6) that comply with 250.56, or

(4) By other approved means of establishing a connection to earth.

Panel Statement: The revised text meets the intent of the submitter.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

S-87 Log #1059 NEC-P05 Final Action: Reject (250.52(A)(3))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-135
Recommendation: Add new text as follows:
In any construction utilizing a new concrete footing, at least one concrete-encased electrode shall be constructed.

Substantiation: Mr. Whitehead offers ample substantiation based on Macon's before-and-after experience. The utility of adding such language is borne out by the practice of various other jurisdictions, including a number in Maryland, that have required Ufers in new construction. The language, "In any construction utilizing a new concrete footing...” is intended to make this easier to accept, by reducing the burden on a contractor, with the Ufer requirement added when there’s going to be a pour anyway.

Panel Meeting Action: Reject
Panel Statement: There is no additional substantiation to require the installation of a concrete-encased electrode. It is not the intent of this section that a concrete-encased electrode be constructed. Rather it must be used if present.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Submitted: Donald A. Ganiere, Ottawa, IL
Comment on Proposal No: 5-155
Recommendation: The panel should accept this proposal.
Substantiation: This proposal should be reviewed in the light of the negative comments of Mr. Mello. I am asking for an additional option for the installation of grounding electrodes. Clearly a 20ft length of bare copper, buried at least 30 in. below grade would be a superior electrode to a single 8ft rod buried horizontally at the same depth as now permitted by 250.53(G).
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 5-90.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

5-92 Log #446 NEC-P05 (250.52(A)(4), FPN (New))
Final Action: Reject
Submitter: Paul Schwartz, FLUOR
Comment on Proposal No: 5-155
Recommendation: Add a new FPN below paragraph 250.52(A)(4) as follows: FPN: For more information regarding the installation of grounding rings, see IEEE 80, Guide for Safety in AC Substation Grounding.
The text may also be added to 250.53(F) if the panel decides it is appropriate.
Substantiation: 250.52(A)(4) allows for grounding rings to be installed. The recommended FPN addition will clarify that information on ground rings and ground grids associated with high voltage installations can be found in IEEE 80.
Panel Meeting Action: Reject
Panel Statement: IEEE 80 generally covers installations outside of the scope of the NEC. A reference to IEEE 80 in 250.52(A)(4) is not helpful to the user.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-93 Log #628 NEC-P05 (250.52(A)(5))
Final Action: Accept
Submitter: Roger J. Montambo, Glavan Industries, Inc.
Comment on Proposal No: 5-160
Recommendation: Affirmative comment!
Substantiation: This communication is intended to provide technical support and acceptance by offering an “affirmative comment” on panel-5’s action to “accept-in-principle” proposed amendment for the 2008 NEC 250.52.A.5, Log #1985. The panel’s action very effectively clarifies 250.52 by eliminating the “accept-in-principle” proposed amendment for the 2008 NEC 250.52.A.5.
The panel maintains that ground ring electrodes are required to encircle the building or structure, and no substantiation has been provided that demonstrates 6.0 m (20 ft) of 2 AWG copper wire in contact with the earth will perform as a satisfactory grounding electrode. The panel maintains that the term “grounding lateral” is undefined and would contribute to inconsistent application and interpretations of the Code rules applying to ground ring electrodes. See panel action and statement on Proposal 5-155 and Comment 5-88.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative: MELLO, C.: The panel statement fails to technically address the substantiation provided. To continue to say the term “grounding lateral” is not defined, when “ground ring” is also not defined, yet both serve the same function is illogical. Technical substantiation was provided from industry practice and also from recognized industry standards on this application. It should be noted that NFPA 780 section 4.13.5 for Lightning Protection systems specifically recognizes the “grounding lateral” as a “radial electrode” as a suitable grounding electrode. The amount of earth contact for a wire 20 feet in length buried 30 inches deep is exactly the same if it is in a straight line or if it is in a circle around a building or structure. The panel did not provide a technical response as to why the ground ring continues to be accepted and this proposed and industry recognized alternative is not.
Galvan is a supporter of the panel’s decision to accept in principle paragraph 250.52(A)(5) - as written. This does not eliminate “non-listed” products which may comply with the code, but provides for a means to verify compliance without the need for special tools and/or equipment during the inspection process.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-94 Log #2077 NEC-P05 (250.52(A)(5))

Final Action: Reject

Submitter: Chuck Mello, Underwriters Laboratories

Comment on Proposal No: 5-156

Recommendation: Revise text of 250.52(A)(5) to read as follows:

250.52(A)(5) Rod-Type and Pipe Electrodes. Rod and pipe-type electrodes shall meet the following requirements:

(a) Rod-type electrodes shall not be smaller than metric designator 21 (trade size 3/4) and, where of iron or steel, shall have the outer surface galvanized or otherwise metal-coated for corrosion protection.

(b) Rod-type electrodes shall meet all the following requirements:

(1) Rod-type electrodes shall be listed.

(2) Rod-type electrodes shall not be less than 2.44 m (8 ft) in length.

(3) Rod-type electrodes of steel, stainless steel, or their equivalent shall not be less than 13 mm (1/2 in.) in diameter.

(4) Rod-type electrodes of steel, other than stainless steel, shall be coated with copper or zinc.

Substantiation: The panel action on proposal 5-156 should have been to Accept in Part. The part to delete the “pipe” electrode was substantiated by the fact, indicated by the installer representatives on the panel, that galvanized pipe or rigid conduit is still used, although infrequently in the United States.

With regard to ground rods the action should have been to Accept in Principle. Over the past three Code cycles there were proposals about hard set size, vs. hard or soft metric conversions, tolerances due to nominal manufacturing size, copper vs. galvanized coating, etc. The submitter made a good case for the enforcement agencies to have all ground rods listed to eliminate this continued flow of proposals and the field issues the many installers and AHJs have to wrestle with about if this one acceptable or is that acceptable, or can I use this splice connector on this rod, and so on. UL 467 already deals with the make up of the rod materials, dimensions, coating issues, suitability of the coating to withstand the impact of installation, compatibility of splice connectors etc. Listing can and does exist for ground rods of various diameters 5/8 inch or greater. One of the major manufacturer’s in his presentation to the panel confirmed that Listing would resolve many of the controversies and issues coming from the industry. In addition, by requiring Listing, some of the existing convoluted Code language can be simplified into a list format as detailed above with the incorporation of panel accepted actions.

The panel should also note that by the present language an Iron or steel rod 5/8 Inch or greater in diameter has no restrictions, no corrosion protection requirements or anything else. The big controversy about sustainability for some time is not even considered for rods that are 5/8 Inch or larger, whereas with the proposed change... all the rods will have to meet specific requirements.

Panel Meeting Action: Rejected

Panel Statement: There is no field evidence to require rod-type electrodes to be listed.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JOHNSTON, M.: The installation of different types and sizes of listed and non-listed rod type grounding electrodes is a concern for the enforcement and installers of rod type grounding electrodes. The submitter is correct that it has led to many confusion among contractors and inspectors. Listing of rod type electrodes is done by some manufacturers and if only listed rod type electrodes were required, there would be no questions by the contractor or the inspector that the rod complies. Enforcers of the code rely on testing laboratories to verify the construction criteria of many electrical components and UL 467 is a standard that evaluates rod type electrodes for various installation conditions. A requirement that all ground rods be listed will result in leveling the playing field and require manufacturers of these grounding electrodes to meet minimum criteria in a product standard, not just the NEC. This type of requirement would benefit the code enforcement community by providing a more ready basis for approvals and limit the amount of non-code-compliant products being installed to meet a grounding requirement, which is an essential element of the electrical safety system. The submitters of the proposal and comment did provide evidence indicating a clear need for this listing requirement.

MELO, C.: The panel statement for rejecting this comment does not address the substantiation provided in the comment. In fact much substantiation has been provided in the several proposals and comments over the last three Code cycles that many ground rods are not suitable or cannot be determined to be suitable for bonding and grounding use by AHJs. It is interesting the panel continues to require a 1/8 inch pipe electrode to be galvanized, yet continues to allow “rod” made of steel or iron 5/8 inch or greater in diameter to be used without any corrosion protection requirements. It is also interesting to note the panels unwavering requirement that the connectors for the grounding electrode conductor to this “rod” have to be listed as grounding and bonding equipment, yet the rod does not if it is 5/8 inch or greater in diameter. In the presentation to the panel this cycle, one such example was shown where a rod failed one of the basic tests for coatings required under the listing, but this rod could continue to be sold and installed since there is no Code listing requirement where 5/8 inch or greater in diameter. The discussion about longevity is not an issue since none of the electrodes identified in 250.52 have requirements for longevity nor is longevity a Code consideration in 250.50. Longevity of the grounding electrode(s) selected is an issue with many variables on soil conditions, moisture, and other environmental variables and is a design decision that goes beyond Code requirements. This comment sought to finally set minimum requirements that would allow products meeting those minimum requirements to be in the marketplace and to enable AHJs to readily verify the product is suitable in its installation. This would take all the debates about nominal dimensions, coatings, and the other product specific arguments surrounding ground rods out of the Code realm and properly place them in the product standard arena where they belong.

5-95 Log #383 NEC-P05 (250.52(A)(5)(b))

Final Action: Reject

Submitter: Michael Gassman, ERICO, Inc.

Comment on Proposal No: 5-160

Recommendation: Revise as follows:

Grounding rod electrodes of stainless steel, solid copper, and or copper coated solid steel or zinc coated steel shall be at least 15.87 mm (5/8 in.) in diameter and may be listed or non-listed. Where the outer diameter is less than 12.70 mm (1/2 in.) in diameter.

Substantiation: 1. The draft of 250.52(A)(5)(b) is ambiguous. The current draft could be interpreted to exclude copper coated steel ground rod electrodes. It also does not specify “rod” electrodes.

The NEC Style Manual states:

3.3...procedure clear, unambiguous, NEC language.

3.3.5...list should be parallel...

2. Solid stainless steel and solid copper ground rod electrodes need to be clearly identified.

3. In the substantiation of Proposal 5-160, “Longevity is NOT part of the NEC.”

Comment:

NEC 90.1 Purpose

NEC 90.1(A) Practical Safeguarding. The purpose...practical safeguarding of persons and property from hazards...

NEC 90.1(B) Adequacy...considered necessary for safety. Compliance therewith and proper maintenance results in an installation that is essentially free from hazard...

Conclusion: Safeguarding and safety indicate longevity. This makes it a code concern.

In addition, 250.52(A)(7)(B) excludes the use of aluminum. This is because it will not last.

“Corrosion” is used throughout the code. It is referred to over 100 times. “Corrosion-resistant is referred to over 30 times.

5. Corrosion resistance is related to longevity.

Galvanic series charts are established based on electrochemical potentials (V) for a material.

Zinc is highly anodic, while copper is noble.

Zinc sacrifices itself for the steel core. Copper protects the steel core. Corrosion due to electrochemical action between dissimilar metals are minimized if the potential difference between the metals is no more than 0.50V.

6. The changes to the code are assuming equality between a stainless steel, a copper coating and a zinc coating, which we know not to be true.

In addition, while no changes will be envisioned for the copper coated ground rod electrode requirements, the proposed change on the zinc coated ground rod electrode means the rod may have up to 36.4% less steel and 20.13% less zinc. It will have a shorter life cycle. Once the zinc corrodes there is less steel to corrode.

7. The most extensive research on metallic structures buried in soils or in contact with soils is the “National Bureau of Standards Circular 579” on underground corrosion.

Page 110 states: “An analysis of these data showed that in most soils, zinc coatings of 2 oz. or less were destroyed during the 10 year exposure period, and pitting of the underlying steel occurred.”

Page 115 states: “It was also shown that a 3 oz. coating provided adequate protection for 10 to 13 years in all the inorganic reducing soils except in soils 51 and 55, which are strongly reducing soils containing high concentrations of soluble salts.”

The report confirms that copper lasts longer than zinc coated steel in buried applications.

8. Technical Report R660 “Field testing of Electrical Grounding Rods” February 1970 by the Naval Facilities Engineering Command reported that after 7 years, zinc coated steel ground rod electrodes have a weight loss of 1.57 to 4.46 times that of a copper coated steel ground rod electrode. Listed copper coated ground rod electrodes have 0.01 in. of copper coating. Zinc coated
9. 250.52(A)(6) on plate electrodes do not differentiate between galvanized steel plate electrode and a plate electrode of iron or steel. The plate electrode must be at least four times thicker than a copper plate electrode. Again, the reason is corrosion.

10. NEMA GR-1 2005 and NESC C2-2007 have both standardized on a minimum 0.625 inch diameter for zinc coated steel ground rod electrodes. The proposed dimension change to the zinc coated steel ground rod electrodes reduces the effectiveness of those rod electrodes in the 5-160 proposal.

11. In the substantiation of Proposal 5-160, “Listed products are certified by a listing laboratory, and are subject to performance testing.”

Comment:
This is an untrue statement. UL tests coated steel ground rod electrodes for physical dimensions and coating adhesion. No corrosion testing is performed.

12. In the substantiation of Proposal 5-160, “The ground rod electrodes addressed herein are “UL” and include permanent marking on the rod.”

Comment: A true statement, however, the stamping is often unreadable as it fills in with zinc. In addition, to pass the “listed” requirements for a zinc coated steel ground rod electrode requires special handling during manufacturing. The special handling of submitted samples would not reflect actual products purchased by the consumer. ERICO’s standard product of zinc coated steel grounds will not pass the listed test.

13. Adding an international perspective, IEC 0364-5-54 2002 requires a STEINMAN, G.: NEMA votes affirmatively on the panel action but

14. Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

S-98 Log #2097 NEC-P05 (250.52(B), FPN )

Final Action: Reject

Submitter: James H. Maxfield, Dover, NH

Comment on Proposal No: 5-166

Recommendation: Add a new FPN to read as follows:

FPN: For further information see NFPA 13, Standard for the Installation of Sprinkler Systems and NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances for the limited use of these systems as grounding electrode.

Substantiation: CMP-5 should reconsider the addition of the FPN as submitted in the proposal stage because Section 10.6.7 of both NFPA 13 and NFPA 24 (2002 ed.) clearly indicates the limited use of the piping systems. Sections 10.6.8 of both standards state “In no case shall pipe in 10.6.7 be used for grounding of electrical service.” The addition of the FPN as submitted would assist the industry in determining what metal water piping systems may be used as grounding electrodes and which documents to refer to.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its original action and statement on Proposal 5-166 and concludes that the additional FPN as suggested in the proposal and comment do not improve usability or provide additional clarity to the requirements of this section. The panel maintains that grounding electrodes as described in 250.52(A) that are present for use in the grounding electrode system for buildings and structures are required to be used to form such grounding electrode systems, regardless of the type of water piping system or its use within the building or structure.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

S-99 Log #1964 NEC-P05 (250.52(B), (2) New )

Final Action: Reject

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 5-165

Recommendation: This Proposal should have been Rejected or Accepted in Principle with the following revised wording for item (2):

Aluminum electrodes in direct contact with the earth.

Substantiation: As proposed and as accepted, the proposal prohibits the use of aluminum structure. The metal used for a structure is not specified in 250.52(A)(2). A metal structure that meets the requirements of that section is not just permitted, it is required to be used as an electrode. Aluminum is not the most common material for building structures, but it is used for many structures such as permanently installed “tents.” The prohibition of aluminum for an electrode system is in direct contradiction to 250.52(A) for both structures. In previous cycles, Panel 5 adopted revised wording for 250.104(C) to recognize structural metal materials other than steel.

Panel Meeting Action: Reject

Panel Statement: The concerns of the submitter are already addressed in the revised definition of Grounding Electrode that resulted from the work of the TCC-assigned task group on grounding and bonding. See panel action and statement on Proposal 5-14 that indicate that grounding electrodes are required to be in direct contact with the earth. The panel actions on Proposal 5-148 and amendments 5-84 and 5-85 also provide additional clarification on the concerns expressed by the submitter.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15
A single electrode consisting of a rod, pipe, or plate that does not have a specified in 250.119. The possibility is not likely that the grounding electrode might this is one. Geez, I wish it was easier to trace what was what.” MBJ, or have I overlooked it? It’s kinda crowded. Where are the GECs? Oh, hunt and to puzzle unnecessarily. “Is this a subpanel that’s missing its floating painted or taped. In performing inspections and consultations, I have had to sort out GECs from hot conductors. It also would be good to more easily sort retaining the unique identification of equipment grounding/bonding conductors, which supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system shall be installed as specified in 250.64(A) through (F).

The present wording of this section presents us with an The submitter added text without substantiation. The NEC Section 250.64 has specific requirements for the grounding electrode conductors that ground the service or the separately derived system as such conductors perform an essential safety function. However, certain installations, particularly installations for information technology and communications technology equipment, often have various supplementary (auxiliary) grounding conductors installed for reasons of electromagnetic compatibility, lightning protection, establishing ground planes for antennas, etc. The change in the definition defines these supplementary grounding conductors as grounding electrode conductors. Thus, the new definition would imply that requirements of 250.64 apply to these supplementary grounding conductors.

I do not believe that CMP 5 intended to change the application of 250.64, nor is there any rationale to change the requirements for all grounding conductors. Therefore, the term grounding electrode conductor in 250.64 should be qualified by the phrase “at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system,” as proposed in this comment.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Report on Comments A2007 — Copyright, NFPA
NFPA 70-138
Substantiation: The grounding conductor should be specified as a grounding electrode conductor for consistence with 250.62, 250.64, and 250.64(B). Since aluminum conductors are permitted in cables and raceway underground and embedded in concrete and masonry separation floor earth where in a raceway or enclosure does not seem warranted. Present wording does not permit a connection (termination) inside a completely enclosed outdoor switchgear assembly. If within 18 in. of the earth “Terminations” implies an end to the conductor, conductors may loop unbroken through ground clamp.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 5-104.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-106 Log #1056 NEC-P05 (250.64(B)) Final Action: Reject

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-184
Recommendation: Accept as proposed.
Substantiation: The CMP lists one objection to the proposed wording: use of an armored conductor should not be prohibited.
Using a coil of armored bare conductor is not much more similar to greenfield with a bare wire field-installed than running ACHI is the same as running greenfield and pulling (kraft-wrapped) insulated wires and a bonding strip through it. Armored conductors are in close proximity to the armor, protecting it much as-in fact better than-the new type of MC cable’s bare conductor protects its armor.

Panel Meeting Action: Reject
Panel Statement: Cable armor is permitted as specified in the last sentence of 250.64(B). The bare armored ground cable is listed as grounding and bonding equipment for this purpose.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-107 Log #1285 NEC-P05 (250.64(C)) Final Action: Reject

Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc.
Comment on Proposal No: 5-186
Recommendation: Reject this Proposal; Restore wording to 2005 NEC language.
Substantiation: 250.64(C) refers to grounding electrode conductors - the connection between one of the grounding electrodes listed in 250.52 and the grounded service bus. In the NEC 2005, 250.64(C)(3) allowed the use of aluminum or copper busbars for “splicing” purposes, or just a convenient location to collect the grounding electrode conductors from various electrodes before attaching with a single conductor to the grounded service bus. [See Proposal 5-158 and Panel Statement, 2005 NEC ROP.] If used for this purpose, for instance, a ground rod used to supplement a metal underground water pipe would require a grounding electrode conductor the same size as the grounding electrode conductor from the metal underground water pipe. This is because the grounding electrode conductor from the ground rod would not be run solely to the grounded service terminal as 250.66(A) through (C) requires for size reduction, but instead to the “collection” busbar. The last sentence of 250.64(F) states: “The grounding electrode conductor shall be sized for the largest grounding electrode conductor required among all the electrodes connected to it.” The exceptions to Table 250.66 listed in 250.66(A) through (C) would not apply.

The installer has the choice to run each grounding electrode conductor directly to the grounded service bus, allowing the provisions of 250.66(A) through (C), but if multiple electrodes are connected/bonded together and run with a common grounding electrode conductor to the service grounded bus, 250.64(F) applies, requiring the same size grounding electrode conductor from each electrode.

The term “bonding jumpers” referred to in 250.64(C)(3), according to Article 100, is “A reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically connected.” In this case the “bonding jumpers” are grounding electrode conductors, but are not run directly/solely to the grounded service bus. “Sole connection” is the main requirement for size reduction, 250.64(A) through (C).

Further, 250.64(F) is concerned with the size of the grounding electrode conductor and its connection to the electrode(s). The copying of 250.64(C)(3) to 250.64(F) would increase understanding, but deleting 250.64(C)(3) would prohibit the use of this “collection” busbar for use with grounding electrode conductors, which does not appear to be the intent of the Proposal submitter. Additionally, 250.64(C)(4) should be kept for the same reason the submitter added it to 250.64(F) - the installer needs to be reminded about the prohibiting of connections to aluminum conductors within 18 inches of the earth.

Panel Meeting Action: Reject
Panel Statement: Section 250.64(C) is to ensure the grounding electrode conductor is continuous, without splices (except as permitted) from the equipment served to the grounding electrode or grounding electrode system. See the revised definition of “grounding electrode conductor” from Comment 5-6. The panel notes that the bonding jumpers used to interconnect multiple grounding electrodes or from the grounding electrodes to the common busbar are not “grounding electrode conductors” and are purposefully identified as “bonding jumpers”. The panel concludes that the installation requirement for the common busbar do belong in 250.64(F) as substantiated in Proposal 5-186.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-108 Log #598 NEC-P05 (250.64(C)(4)) Final Action: Accept

Comment on Proposal No: 5-186
Recommendation: We support the proposal.
Substantiation: None given.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-109 Log #1206 NEC-P05 Final Action: Accept in Principle (250.64(C)(4))

Submitter: James Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 5-186
Recommendation: We support the panel’s action in Accepting this Proposal as written.
Substantiation: None.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 5-113.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-110 Log #517 NEC-P05 (250.64(E)) Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 5-194
Recommendation: Accept the proposal.
Substantiation: This section only requires ferrous enclosures for grounding electrode conductors (e.g., raceways) to be electrically continuous and exempts nonferrous raceways. 250.92(A)(3) requires bonding of metallic (includes ferrous and nonferrous types) raceways and enclosures which in effect makes them electrically continuous.

Panel Meeting Action: Reject
Panel Statement: The referenced 250.92(A)(3) was removed by panel action on Proposal 5-219 and therefore no longer applies to raceways containing grounding electrode conductors. Only 250.64(E) addresses raceways for grounding electrode conductors and the panel intends that this apply only to ferrous metal raceways.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-111 Log #922 NEC-P05 (250.64(E)) Final Action: Accept

Submitter: Peter D. Noval, Jr., Philadelphia, PA
Comment on Proposal No: 5-195
Recommendation: Delete “service equipment” from text proposed by panel meeting action, so that the section reads as follows:
(E) Enclosures for Grounding Electrode Conductors. Ferrous metal enclosures for grounding electrode conductors shall be electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode and shall be securely fastened to the ground clamp or fitting. Nonferrous metal enclosures shall not be required to be electrically continuous. Ferrous metal enclosures that are not physically continuous from cabinets or equipment to the grounding electrode shall be made electrically continuous by bonding each end of the raceway or enclosure to the grounding electrode conductor. Bonding shall apply at each end and to all intervening ferrous raceways, boxes, and enclosures between the service equipment, cabinets, or equipment cabinets or equipment and the grounding electrode.

The bonding jumper for a grounding electrode conductor raceway or cable armor shall be the same size as, or larger than, the required enclosed grounding electrode conductor. Where a raceway is used as protection for a grounding electrode conductor, the installation shall comply with the requirements of this appropriate raceway article.
In support of this statement, the revised text makes it clear that all metal enclosures shall be electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode and shall be securely fastened to the ground clamp or fitting. 

Panel Meeting Action: Accept 
Number Eligible to Vote: 15 
Ballot Results: Affirmative: 15 

5-112 Log #924 NEC-P05 
Final Action: Reject 
(250.64(E)) 

Submitter: Peter D. Noval, Jr., Philadelphia, PA 
Recommendation: Revise text to read as follows: 

(E) Enclosures for Grounding Electrode Conductors. Ferrous metal enclosures for grounding electrode conductors shall be electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode and shall be securely fastened to the ground clamp or fitting. 

Nonferrous metal enclosures shall not be required to be electrically continuous. Ferrous metal enclosures that are not physically continuous from cabinets or equipment to the grounding electrode shall be made electrically continuous by bonding each end of the raceway or enclosure to the grounding electrode conductor. Bonding shall be made at each end and to all intervening metal raceways, boxes, and enclosures between the service equipment and the grounding electrode. The bonding jumper for a grounding electrode conductor raceway or cable armor shall be the same size as, or larger than, the required enclosed grounding electrode conductor. Where a raceway is used as protection for a grounding electrode conductor, the installation shall comply with the requirements of the appropriate raceway article. 

Substantiation: I am in agreement with the panel statement that “the electrically continuous requirement applies to metal enclosures for grounding electrode conductors and is the general requirement of this section. The bonding requirements are applicable where the metal enclosure is not electrically continuous from the cabinet or enclosure to the grounding electrode.” 

In support of this statement, the revised text makes it clear that all metal enclosures, not just ferrous ones, are subject to the intent of the panel, with regard to bonding requirements, where the metal enclosure is not electrically continuous from the cabinet or enclosure to the grounding electrode. 

In addition, as written, 250.64(E) does not require nonferrous metal enclosures to be “securely fastened to the ground clamp or fitting.” Only ferrous metal enclosures need to “be securely fastened to the ground clamp or fitting.” If this intent here is bonding the enclosure, that requirement is stated in subsequent text. 

The revised text clarifies the intent of this section by deleting this potentially unenforceable statement. 

Further if the panel insists on retaining the exemption from bonding for nonferrous metal enclosures in 250.64(E), then Section V. Bonding should be reviewed and revised accordingly to provide consistency throughout Article 250. 

Panel Meeting Action: Accept 
Panel Statement: The proposal would lessen the requirements of this section without technical substantiation. The electrically continuous requirement applies to ferrous metal enclosures for grounding electrode conductors and is the general requirement of this section. The bonding requirements are applicable where the ferrous metal enclosure is not electrically continuous from the cabinet or enclosure to the grounding electrode. 

Number Eligible to Vote: 15 
Ballot Results: Affirmative: 15 

5-113 Log #32 NEC-P05 
Final Action: Accept 
(250.64(F)) 

Submitter: Technical Correlating Committee on National Electrical Code 
Comment on Proposal No: 5-203 
Recommendation: The Technical Correlating Committee directs that the Code-Making Panel clarify the Panel Action on this Proposal with respect to the wording of the subsections (1) through (4) and their relationship to (F). This action will be considered by the Code-Making Panel as a Public Comment. 

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects. 

Panel Meeting Action: Accept 
Revise the text of 250.64(F) from the 2008 NEC Draft as follows: 

(F) Installation to Electrodes(s). A grounding electrode conductor(s) and bonding jumpers interconnecting grounding electrodes shall be permitted installed as in (1), (2), or (3) below. The grounding electrode conductor shall be sized for the largest grounding electrode conductor required among all the electrodes connected to it. 

1. The grounding electrode conductor shall be permitted to be run to any convenient grounding electrode available in the grounding electrode system where the other electrode(s), if any, are connected by bonding jumpers per 250.53(C). 

2. The grounding electrode conductor(s) shall be permitted to be run to one or more grounding electrode(s) individually. 

3. To bonding jumper(s) from grounding electrode(s) and grounding electrode conductor(s) shall be permitted to be connected to an aluminum or copper busbar not less than 6 mm × 50 mm (1.4 in. × 2 in.). The busbar shall be securely fastened and shall be installed in an accessible location. Connections shall be made by a listed connector or by the exothermic welding process. 

The grounding electrode conductor shall be permitted to be run to the busbar. Where aluminum busbars are used, the installation shall comply with 250.64(A). 

Final Action: Accept in Principle 
Panel Statement: The panel accepts the direction of the TCC to clarify the text. The panel action accomplishes this direction. 

Number Eligible to Vote: 15 
Ballot Results: Affirmative: 15 

5-114 Log #1842 NEC-P05 
Final Action: Accept in Principle 
(250.64(F)) 

Submitter: Mike Holt, Mike Holt Enterprises, Inc. 
Comment on Proposal No: 5-203 
Recommendation: Accept the proposed language, with the following changes: 

1. Be run to any convenient grounding electrode available in the grounding electrode system, or 

2. One or more grounding electrode(s) individually, or 

3. To bonding jumper(s) from grounding electrode(s) and grounding electrode conductor(s) shall be permitted to be connected to an aluminum or copper busbar not less than 6 mm × 50 mm (1.4 in. × 2 in.). The busbar shall be securely fastened and shall be installed in an accessible location. Connections shall be made by a listed connector or by the exothermic welding process. 

Substantiation: As the TCC stated, the proposed text does not make sense grammatically. In addition, there is no reason to repeat the requirement for aluminum conductors and busbars complying with 250.64(A), since (F) does not modify the rule of (A). The remainder of the proposed (4) is better located in the charging text of (F), since it applies to all installations, not just busbars. 

Panel Meeting Action: Accept in Principle 
Panel Statement: See panel action and statement on Comment 5-113. 

Number Eligible to Vote: 15 
Ballot Results: Affirmative: 15 

5-115 Log #1442 NEC-P05 
Final Action: Reject 
(Table 250.66) 

Submitter: Lawrence Cross, Local Union #98 IBEW 
Comment on Proposal No: 5-206 
Recommendation: Add new table: Table 250.67, Grounded Conductor, System Bonding and Main Bonding Conductors. 

Panel Meeting Action: Accept 
Revise the text of 250.64(F) from the 2008 NEC Draft as follows: 

(F) Installation to Electrodes(s). A grounding electrode conductor(s) and bonding jumpers interconnecting grounding electrodes shall be permitted installed as in (1), (2), or (3) below. The grounding electrode conductor shall be sized for the largest grounding electrode conductor required among all the electrodes connected to it. 

1. The grounding electrode conductor shall be permitted to be run to any convenient grounding electrode available in the grounding electrode system where the other electrode(s), if any, are connected by bonding jumpers per 250.53(C). 

2. The grounding electrode conductor(s) shall be permitted to be run to one or more grounding electrode(s) individually. 

3. To bonding jumper(s) from grounding electrode(s) and grounding electrode conductor(s) shall be permitted to be connected to an aluminum or copper busbar not less than 6 mm × 50 mm (1.4 in. × 2 in.). The busbar shall be securely fastened and shall be installed in an accessible location. Connections shall be made by a listed connector or by the exothermic welding process. 

The grounding electrode conductor shall be permitted to be run to the busbar. Where aluminum busbars are used, the installation shall comply with 250.64(A). 

Final Action: Accept in Principle 
Panel Statement: The panel accepts the direction of the TCC to clarify the text. The panel action accomplishes this direction. 

Number Eligible to Vote: 15 
Ballot Results: Affirmative: 15
### Table 250.67 Grounded, Main Bonding and System Bonding Conductors for Alternating-Current Systems

<table>
<thead>
<tr>
<th>Size of Largest Ungrounded Service-Entrance Conductor or Equivalent Area for Parallel Conductors (AWG/kcmil)</th>
<th>Size of Grounded, Main Bonding and System-Bonding Conductors (AWG/kcmil)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conductor</strong></td>
<td><strong>Aluminum</strong></td>
</tr>
<tr>
<td><strong>2 or smaller</strong></td>
<td>1/0 or smaller</td>
</tr>
<tr>
<td><strong>1 or 1/0</strong></td>
<td>2/0 or 3/0</td>
</tr>
<tr>
<td><strong>2/0 or 3/0</strong></td>
<td>4/0 or 250</td>
</tr>
<tr>
<td><strong>Over 3/0, through 350</strong></td>
<td>Over 250, through 300</td>
</tr>
<tr>
<td><strong>Over 250, through 600</strong></td>
<td>Over 500, through 900</td>
</tr>
<tr>
<td><strong>Over 600, through 1100</strong></td>
<td>Over 900, through 1750</td>
</tr>
<tr>
<td><strong>Over 1100, through 1500</strong></td>
<td>Over 1750, through 2000</td>
</tr>
<tr>
<td><strong>Over 1500, through 2000</strong></td>
<td>Over 2000, through 3000</td>
</tr>
<tr>
<td><strong>Over 2000, through 2500</strong></td>
<td>Over 3000</td>
</tr>
<tr>
<td><strong>Over 2500, through 3000</strong></td>
<td>Over 4000</td>
</tr>
<tr>
<td><strong>Over 3000, through 3500</strong></td>
<td>Over 5000</td>
</tr>
<tr>
<td><strong>Over 3500, through 4000</strong></td>
<td>Over 6000</td>
</tr>
<tr>
<td><strong>Over 4000, through 5000</strong></td>
<td>Over 7000, through 7500</td>
</tr>
<tr>
<td><strong>Over 5000, through 6000</strong></td>
<td>Over 8000</td>
</tr>
</tbody>
</table>

See note 1

*Note 1. Size of largest ungrounded service-entrance conductor \( \times 12 \)

1/2 percent = size of conductors.

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**Substantiation:** Panel should accept new table 250.67 Grounded Conductor, System Bonding and Main Bonding Conductors. The new table will show the aluminum or copper-clad aluminum with size ranges as per the panel statement, also the 12.5 percent calculations in the table up to 8000 KCMIL Conductors.

**Panel Meeting Action:** Reject

**Panel Statement:** There are no code sections that refer to the new Table 250.67. The requirements that point to Table 250.66 with the qualifiers of sizing over 1100 kcmil copper or 1750 kcmil aluminum make this new table unnecessary.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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**TCC Action:** The Technical Correlating Committee directs that the language be modified as shown in the affirmative comment on vote.

In addition, the Technical Correlating Committee understands that in the Committee on Proposal No: 5-16.

**Recommendation:** Modify the first paragraph of 250.66 as follows:

**250.66 Size of Alternating-Current Grounding Electrode Conductor**

The size of the grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system of a grounded or ungrounded ac system shall not be less than given in Table 250.66, except as permitted in 250.66(A) through (C).

**Substantiation:** This is a correlating comment to resolve a problem created by the change in the definition of the “grounding electrode conductor.”

NESC Section 250.66 has specific requirements for the grounding electrode conductors that ground the service or the separately derived system as such conductors perform an essential safety function. However, certain installations, particularly installations for information technology and communications technology equipment, often have various supplementary (auxiliary) grounding conductors installed for reasons of electromagnetic compatibility, lightning protection, establishing ground planes for antennas, etc. The change in the definition defines these supplementary grounding conductors as grounding electrode conductors. Thus, the new definition would imply that requirements of 250.66 apply to these supplementary grounding conductors.

I do not believe that CMP 5 intended to change the application of 250.66, nor is there any rationale to change the requirements for all grounding conductors. Therefore, the term grounding electrode conductor in 250.66 should be qualified by the phrase “at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system,” as proposed in this comment.

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**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**Comment on Proposal No:** 5-167

**Submitter:** Jeffrey Boksiner, Telcordia Technologies, Inc. / Rep. Alliance

**Substantiation:** Panel should accept new table 250.67 Grounded Conductor, System Bonding and Main Bonding Conductors. The new table will show the aluminum or copper-clad aluminum with size ranges as per the panel statement, also the 12.5 percent calculations in the table up to 8000 KCMIL Conductors.

**Panel Meeting Action:** Reject

**Panel Statement:** There are no code sections that refer to the new Table 250.67. The requirements that point to Table 250.66 with the qualifiers of sizing over 1100 kcmil copper or 1750 kcmil aluminum make this new table unnecessary.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**TCC Action:** The Technical Correlating Committee directs that the language be modified as shown in the affirmative comment on vote.

In addition, the Technical Correlating Committee understands that in the Committee on Proposal No: 5-16.

**Recommendation:** Modify the first paragraph of 250.66 as follows:

**250.66 Size of Alternating-Current Grounding Electrode Conductor**

The size of the grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system of a grounded or ungrounded ac system shall not be less than given in Table 250.66, except as permitted in 250.66(A) through (C).

**Substantiation:** This is a correlating comment to resolve a problem created by the change in the definition of the “grounding electrode conductor.”

NESC Section 250.66 has specific requirements for the grounding electrode conductors that ground the service or the separately derived system as such conductors perform an essential safety function. However, certain installations, particularly installations for information technology and communications technology equipment, often have various supplementary (auxiliary) grounding conductors installed for reasons of electromagnetic compatibility, lightning protection, establishing ground planes for antennas, etc. The change in the definition defines these supplementary grounding conductors as grounding electrode conductors. Thus, the new definition would imply that requirements of 250.66 apply to these supplementary grounding conductors.

I do not believe that CMP 5 intended to change the application of 250.66, nor is there any rationale to change the requirements for all grounding conductors. Therefore, the term grounding electrode conductor in 250.66 should be qualified by the phrase “at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system,” as proposed in this comment.

---

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**Comment on Proposal No:** 5-167

**Submitter:** Jeffrey Boksiner, Telcordia Technologies, Inc. / Rep. Alliance

**Substantiation:** Panel should accept new table 250.67 Grounded Conductor, System Bonding and MainBonding Conductors. The new table will show the aluminum or copper-clad aluminum with size ranges as per the panel statement, also the 12.5 percent calculations in the table up to 8000 KCMIL Conductors.

**Panel Meeting Action:** Reject

**Panel Statement:** There are no code sections that refer to the new Table 250.67. The requirements that point to Table 250.66 with the qualifiers of sizing over 1100 kcmil copper or 1750 kcmil aluminum make this new table unnecessary.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**TCC Action:** The Technical Correlating Committee directs that the language be modified as shown in the affirmative comment on vote.

In addition, the Technical Correlating Committee understands that in the Committee on Proposal No: 5-16.

**Recommendation:** Modify the first paragraph of 250.66 as follows:

**250.66 Size of Alternating-Current Grounding Electrode Conductor**

The size of the grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system of a grounded or ungrounded ac system shall not be less than given in Table 250.66, except as permitted in 250.66(A) through (C).

**Substantiation:** This is a correlating comment to resolve a problem created by the change in the definition of the “grounding electrode conductor.”

NESC Section 250.66 has specific requirements for the grounding electrode conductors that ground the service or the separately derived system as such conductors perform an essential safety function. However, certain installations, particularly installations for information technology and communications technology equipment, often have various supplementary (auxiliary) grounding conductors installed for reasons of electromagnetic compatibility, lightning protection, establishing ground planes for antennas, etc. The change in the definition defines these supplementary grounding conductors as grounding electrode conductors. Thus, the new definition would imply that requirements of 250.66 apply to these supplementary grounding conductors.

I do not believe that CMP 5 intended to change the application of 250.66, nor is there any rationale to change the requirements for all grounding conductors. Therefore, the term grounding electrode conductor in 250.66 should be qualified by the phrase “at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system,” as proposed in this comment.
UL White Book (KDER) recommends that “If there is a need for such a conductor a grounding bushing should be used.” Note: KDER “covers bonding devices, ground clasps, grounding and bonding bushings and locknuts, ground rods, armored grounding wire, protector grounding wire, grounding wedges, ground clamps for securing the ground wire to an outlet box, water meter shut-off, and similar equipment”. Applying all the standards and knowledge one can teach and apply these applications, it would be helpful and added safety for bonding the electrode to enclosures.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its action and statements on Proposal 5-205 (Log No. 1437). See also panel action and statement on Proposal 5-167 (Log No. 1053) in the 2004 Report on Proposals
Number Eligible to Vote: 15
Affirmative: 15

5-118 Log #1123 NEC-P05
(250.66(D))
Final Action: Reject

Comment on Proposal No: 5-211
Recommendation: Please review requested technical substantiation and accept the proposal.
Substantiation: Figure 11-14 on page 206 of Soares Grounding and Bonding gives the five second withstand rating of a #6 copper conductor as 621 amperes-per ICEA (the lowest of the 3 values). Based on unrealistically low residential grounding electrode systems of 5 Ohms at 120V to ground, the current in the grounding electrode conductor with be 24 amperes. Let’s consider a residential primary voltage conductor, 2100V to ground, contact the service (worst case) in a storm, the current would be 420 amperes - and this is for a 5 OHM grounding electrode system! How many of those are out there? The service conductor size has no effect on the current on the grounding electrode conductor.

Panel Meeting Action: Reject
Panel Statement: Insufficient substantiation has been provided to relax the minimum sizing requirements for grounding electrode conductors for existing installations at single-family dwellings. The proposed text is not adequate in all cases. Grounding electrode conductors for all installations are required to meet the minimum sizes specified in 250.66.
Number Eligible to Vote: 15
Affirmative: 15

5-119 Log #1524 NEC-P05
(250.68)
Final Action: Accept

TCC Action: The Technical Correlating Committee directs that the language be modified as shown in the affirmative comment on vote.
In addition, the Technical Correlating Committee understands that this comment relates to the action taken on Proposal 5-18.
Comment on Proposal No: 5-16
Recommendation: Add a new the first paragraph to 250.68 as follows: 250.68 Grounding Electrode Conductor and Bonding Jumpcon Connection to Grounding Electrodes.

The connections of grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system and associated bonding jumper(s) shall be made as specified 250.68(A) and (B).
Substantiation: This is a correlating comment to resolve a problem created by the change in the definition of the “grounding electrode conductor.” NEC Section 250.68 has specific requirements for the grounding electrode conductors that ground the service or the separately derived system as such conductors perform an essential safety function. However, certain installations, particularly installations for information technology and communications technology equipment, often have various supplementary (auxiliary) grounding conductors installed for reasons of electromagnetic compatibility, lighting protection, establishing ground planes for antennas, etc. The change in the definition defines these supplementary grounding conductors as grounding electrode conductors. Thus, the new definition would imply that requirements of 250.68 apply to these supplementary grounding conductors. I do not believe that CMP 5 intended to change the application of 250.68, nor is there any rationale to change the requirements for all grounding conductors. Therefore, the text grounding electrode conductor in 250.68 should be qualify by the phrase “at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system,” as proposed in this comment.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Affirmative: 15

Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 5-212
Recommendation: Accept proposal as submitted.
Substantiation: For several code cycles, I have submitted proposals and comment to this section hoping to gain understanding for the purpose of the accessibility requirement. The panel statement for this proposal appears to question the value of the “listing” of these termination fittings. If they are listed for the purpose of terminating grounding electrode conductors to the specific electrode that is utilized, it would seem that users and AHJ should be concerned for the connection loosening during construction. If there is concern for loosening, it seems these mechanical connections should be prohibited. I still do not see any explanation for CMP-S’s confidence these mechanical connections will not loosen where installed in concrete or direct burial applications. Outdoor, underground connections to ground rods, rebar, or water pipe would definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on “Hey, Bud, you should know what they intend here” translation. Saying “…the word...is generally understood in...[this] application” demands just a sort of interpretation. I don’t know how commonly inexpert inspectors make the sort of mistake Mr. Schwam is trying to head off, but I do know that AHJ’s often rely on inadequately trained inspectors. For this reason, the Style Manual’s blessing on terms that have become accepted warrants sparing use. The CMP does have a point, that while the change in the original proposal to remove the sense of “permanent” as meaning “not subject to removal” is worthwhile, the idea of using a means with integrity is worth retaining. I propose “durable,” a term used elsewhere in the NEC for similar purposes, so it would read, “The connections of grounding electrode conductor at the service, at each building or structure where supplied by a feeder(s) or branch circuit(s), or at the source of a separately derived system, and associated bonding jumper(s) shall be made as specified 250.68(A) and (B).”

5-120 Log #2034 NEC-P05
(250.68(A))
Final Action: Reject

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 5-214
Recommendation: Revise text to read as follows:

(B) Effective Grounding Path: The connection of a grounding electrode conductor or bonding jumper to a grounding electrode shall be made in a manner that will ensure a permanent durable and effective grounding path.
Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on “Hey, Bud, you should know what they intend here” translation. Saying “…the word...is generally understood in...[this] application” demands just a sort of interpretation. I don’t know how commonly inexpert inspectors make the sort of mistake Mr. Schwam is trying to head off, but I do know that AHJ’s often rely on inadequately trained inspectors. For this reason, the Style Manual’s blessing on terms that have become accepted warrants sparing use. The CMP does have a point, that while the change in the original proposal to remove the sense of “permanent” as meaning “not subject to removal” is worthwhile, the idea of using a means with integrity is worth retaining. I propose “durable,” a term used elsewhere in the NEC for similar purposes, so better conveying the intent.

Panel Meeting Action: Accept in Principle
The panel action is to remove the word “permanent” and revise 250.68(B) as follows:

(B) Effective Grounding Path The connection of a grounding electrode conductor or bonding jumper to a grounding electrode shall be made in a manner that will ensure an permanent and effective grounding path.

Panel Statement: The panel agrees with the concept of removing the word “permanent” from this section and does not agree that the proposed replacement word “durable” is necessary for this section. Removing the word “permanent” addresses some concerns of the submitter, and not replacing it with any other descriptive word addresses the other concerns of subjectivity, ambiguity, enforceability, and inconsistent application of the provisions of this section by users of the Code. The panel concludes that the descriptive wording provides the performance language necessary for users without the use of the
word “permanent” or any other descriptive adjective. The panel also affirms that this action to remove the word “permanent” is consistent with similar revisions in NEC where the same concerns were raised about the use of this word.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-123 Log #599 NEC-P05 Final Action: Accept (250.84(A))
Comment on Proposal No: 5-217
Recommendation: We support the panel’s action in Accepting this Proposal as written.
Substantiation: None given.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-124 Log #1207 NEC-P05 Final Action: Accept (250.84(A))
Submitter: James W. Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 5-217
Recommendation: We support the panel’s action in Accepting this Proposal as written.
Substantiation: None.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-125 Log #1151 NEC-P05 Final Action: Accept in Principle (250.94)
Comment on Proposal No: 5-220
Recommendation: Add the following underlined text in 250.84 of Proposal 5-220:
Bonding for Other Systems. An intersystem bonding termination for connecting intersystem bonding and grounding conductors required for other systems shall be provided external to enclosures at the service equipment and at the disconnecting means for any additional buildings or structures. The intersystem bonding termination shall be accessible for connection and inspection. The intersystem bonding termination shall have the capacity for connection of not less than three intersystem bonding conductors. The intersystem bonding termination device shall be one of the following:
(1) A set of terminals securely mounted to the meter socket enclosure and electrically connected to the meter socket enclosure. This terminals and the enclosure shall be listed for grounding. The terminals shall be listed as grounding and bonding equipment.
(2) A bonding bar near the grounding electrode conductor. The bonding bar shall be connected with a minimum 6 AWG copper conductor to an equipment grounding conductor(s) in the service equipment enclosure, meter socket enclosure or exposed nonflexible metallic raceway.
(3) A bonding bar near the grounding electrode conductor. The bonding bar shall be connected with a minimum 6 AWG copper conductor to an equipment grounding conductor(s) in the service equipment enclosure, meter socket enclosure or exposed metallic raceway.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-126 Log #1962 NEC-P05 Final Action: Reject (250.94)
Submitter: Elliot Rapaport, Electro Technology Consultants
Comment on Proposal No: 5-220
Recommendation: The existing text in the 2005 NEC should be indicated as Exception 2 and the exception in Proposal 5-220 should be numbered Exception 1.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Suggested Action: At Section 250.96(A) of Proposal 5-48, replace the text in

For circuits of over 250 volts to ground, the electrical continuity of metal

250.97 Bonding for Over 250 Volts.

Recommendation: Submitter: ________________________________

(250.97 Exception)

5-129 Log #980 NEC-P05 Final Action: Accept in Principle
(250.94(1))

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee understands that the panel meeting action text modifies the panel actions on Proposals 5-224
and 5-224a.

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 5-223

Recommendation: Revise text to read as follows:

"...to provide a permanent durable electrical bond,..."

Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by special definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on "Hey, Bud, you should know what they intend here" translation. Saying "the...word...is generally understood as it relates..." demands just that sort of interpretation. I don't know how commonly inexpert inspectors make the sort of mistake Mr. Schwan is trying to head off, but I do know that AHJs often rely on inadequately trained inspectors. For this reason, the Style Manual's blessing on terms that have become accepted warrants sparing use.

The CMP does have a point, that while the change in the original proposal to remove the sense of "permanent" as meaning "not subject to removal" is worthwhile, the idea of using a means with integrity is worth retaining. I propose "durable," a term used elsewhere in the NEC for similar purposes, as better conveying the intent.

Panel Meeting Action: Accept in Principle

The panel action is to remove the word "permanent" and revise 250.97 Exception as follows:

Exemption: Where oversized, concentric, or eccentric knockouts are not encountered, or where a box or enclosure with concentric or eccentric knockouts is listed to provide a permanent, reliable electrical bond, the following methods shall be permitted:

(1) Threadless couplings and connectors for cables with metal sheaths
(2) Two locknuts, on rigid metal conduit or intermediate metal conduit, one inside and one outside of boxes and cabinets
(3) Fittings with shoulders that seat firmly against the box or cabinet, such as electrical metallic tubing connectors, flexible metal conduit connectors, and cable connectors, with one locknut on the inside of boxes and cabinets
(4) Listed fittings

Substantiation: Delete "is installed" since the added text places two verbs into the sentence where only one is required.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 5-130.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-130 Log #1058 NEC-P05 Final Action: Accept in Principle
(250.97 Exception)

TCC Action: The Technical Correlating Committee understands that the panel meeting action text modifies the panel actions on Proposals 5-224
and 5-224a.

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 5-223

Recommendation: Revise text to read as follows:

"...to provide a permanent durable electrical bond,..."

Substantiation: Our interpretation and enforcement of the NEC is supposed to be based on the dictionary definitions of common English terms, augmented by special definitions found in Article 100, and those unique to particular articles and defined at the beginning of each such article. While the NEC is not intended as a design manual for untrained persons, its language is not supposed to be based on "Hey, Bud, you should know what they intend here" translation. Saying "the...word...is generally understood as it relates..." demands just that sort of interpretation. I don't know how commonly inexpert inspectors make the sort of mistake Mr. Schwan is trying to head off, but I do know that AHJs often rely on inadequately trained inspectors. For this reason, the Style Manual's blessing on terms that have become accepted warrants sparing use.

The CMP does have a point, that while the change in the original proposal to remove the sense of "permanent" as meaning "not subject to removal" is worthwhile, the idea of using a means with integrity is worth retaining. I propose "durable," a term used elsewhere in the NEC for similar purposes, as better conveying the intent.

Panel Meeting Action: Accept in Principle

The panel action is to remove the word "permanent" and revise 250.97 Exception as follows:

Exemption: Where oversized, concentric, or eccentric knockouts are not encountered, or where a box or enclosure with concentric or eccentric knockouts is listed to provide a permanent, reliable electrical bond, the following methods shall be permitted:

(1) Threadless couplings and connectors for cables with metal sheaths
(2) Two locknuts, on rigid metal conduit or intermediate metal conduit, one inside and one outside of boxes and cabinets
(3) Fittings with shoulders that seat firmly against the box or cabinet, such as electrical metallic tubing connectors, flexible metal conduit connectors, and cable connectors, with one locknut on the inside of boxes and cabinets
(4) Listed fittings

Substantiation: Delete "is installed" since the added text places two verbs into the sentence where only one is required.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 5-130.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

5-130 Log #1058 NEC-P05 Final Action: Accept in Principle
(250.97 Exception)
250.104 Bonding of Piping Systems and Exposed Structural Steel.

Additional safety.

Technical Correlating Committee also notes that the proposed FPN would add an unnecessary third reference to NFPA 780.

Submitter: Robert Torbin, Cutting Edge Solutions, LLC / Rep. Titeflex Corporation

Recommendation: Revise text to read as follows:

250.104 Bonding of Piping Systems and Exposed Structural Steel. (B) Other Metal Piping. Where installed in or attached to a building or structure, metal piping system(s), including gas piping, that is likely to become energized shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with 250.122, using the rating of the circuit that is likely to energize the piping system(s). The equipment grounding conductor for the circuit that is likely to energize the piping shall be permitted to serve as the bonding means. The points of attachment of the bonding jumper(s) shall be accessible.

As determined by the authority having jurisdiction, the equipment grounding conductor for the circuit that is likely to energize the piping shall be permitted to serve as the bonding means. In geographical locations subject to high lightning activity, the authority having jurisdiction may require a single bonding connection. When a single bond is made at the service entrance, the bonding jumper shall be sized in accordance with 250.66 and connected in accordance with 250.70.

Substantiation: Corrugated stainless steel tubing (CSST) is used as gas piping extensively throughout the United States, and has demonstrated a propensity to become energized from nearby lightning strikes. Conventional bonding of gas piping through the equipment grounding conductor [NEC 250.104(B)] has proven inadequate (under these circumstances) to protect the CSST from arcing damage. The submitted technical article summarizes the arcing damage inflicted on gas piping caused by indirect lightning strikes. CSST manufacturers collectively report dozens of damaged systems caused by improper or inadequate bonding resulting in fire damage or loss of property. The ROP 5-239 (lightning protection) was rejected because mandatory text does not belong in the FPN. Therefore, this necessitates some modifications to 250.104(B), as recommended in the submitted change, to allow alternative methods for direct bonding of metal piping to the grounding system to insure a minimum threshold of protection from all threats (including indirect lightning strikes) that are likely to energize the piping. Current bonding of gas piping to the equipment grounding conductor will continue to be permitted. More prescriptive language is being submitted to NFPA 54 National Fuel Gas Code for the 2009 cycle.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: The proposed text would add vague and unenforceable language. The phrase “geographical locations subject to high lightning activity” would be difficult to apply consistently and is one example.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Final Action: Reject

5-132 Log #1431 NEC-P05 (250.104(B))

Comment on Proposal No: 5-239

Recommendation: Revise the existing Fine Print Note in 250.104(B) as follows:

FPN: Bonding all piping and metal air ducts within the premises will provide additional safety. For structures with a lightning protection system, NFPA 780 requires that all grounding media on a structure be interconnected to provide a common ground potential. This interconnection includes lightning protection, electric service, telephone, and communication system grounds, as well as underground metallic piping systems. For further information see NFPA 780-2004, Standard for the Installation of Lightning Protection Systems.

Substantiation: This submission corrects the procedural error incorporated in the original proposal correctly indicated in the panel’s rejection of the original submission.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel moved the FPN to 250.106 to consolidate all lightning protection explanatory information.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Final Action: Reject

5-135 Log #2073 NEC-P05 (250.106, FPN 2)

Submitter: Chuck Mello, Underwriters Laboratories

Comment on Proposal No: 5-247

Recommendation: Revise the text to read as follows:

250.106 FN No. 2: Metal raceways, enclosures, frames, and other non-current-carrying metal parts of electric equipment installed on a building equipped with a lightning protection system may require bonding to or spacing from the lightning protection conductors based on the calculated sideflash distances in accordance with NFPA 780-2004, Standard for the Installation of Lightning Protection Systems. Separation from lightning protection conductors is typically 1.6 m (6 ft) through air or 900 mm (3 ft) through dense materials such as concrete, brick, or wood.

TCC Action: The Technical Correlating Committee directs that the comment be reported as reject because the FPN may be interpreted as a requirement, which is in violation of 3.1.3 of the NEC Style Manual. The Technical Correlating Committee also notes that the proposed FPN would add an unnecessary third reference to NFPA 780.

Submitter: Technical Committee on Lightning Protection, Comment: 5-239

Recommendation: Revise the existing Fine Print Note in 250.104(B) as follows:

FPN: Bonding all piping and metal air ducts within the premises will provide additional safety. For structures with a lightning protection system, NFPA 780 requires that all grounding media on a structure be interconnected to provide a common ground potential. This interconnection includes lightning protection, electric service, telephone, and communication system grounds, as well as underground metallic piping systems. For further information see NFPA 780-2004, Standard for the Installation of Lightning Protection Systems.

Substantiation: This submission corrects the procedural error incorporated in the original proposal correctly indicated in the panel’s rejection of the original submission.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel moved the FPN to 250.106 to consolidate all lightning protection explanatory information.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Final Action: Reject

5-136 Log #1987 NEC-P05 (250.118(2) Exception (New))

Submitter: James S. Conrad, Tyco Thermal Controls

Comment on Proposal No: 5-256

Recommendation: Although this proposal was originally submitted as an exception to 250.118(2) it would be more appropriate as an explanatory FPN in 250.120(A) to read as follows:

FPN: See the UL Guide Information on FHT systems for grounding conductors installed in a raceway that are part of an Electrical Circuit Protective System or a fire rated cable listed to maintain circuit integrity.
FPN: See the UL Guide Information on FHIT systems for grounding conductors installed in a raceway that are part of an electrical circuit protective system or a fire rated cable listed to maintain circuit integrity.

**Substantiation:** This proposed FPN has had public review and should not be considered new material for as the concept in Proposal 5-257 was to bring an awareness for selecting the proper ground wire for fire rated circuits as outlined in the UL guide.

The UL guide information for FHIT systems states: “If not specified, the ground shall be the same as the fire-rated wire described in the system. Use of any other ground wire violates the system fire rating. As an example, THHN ground wire should not be used with a fire-rated system unless specified in the system.”

Fire rated cables are used for life safety circuits in Article 700 and Article 695 and this FPN would clarify the importance of the proper type of ground wire used with these systems.

**Panel Meeting Action:** Accept in Principle

In the proposed text, editorially correct the term “grounding conductor” to “equipment grounding conductor” in the FPN.

**Panel Statement:** Editorial correction to the FPN.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**Comment on Affirmative:**

BRETT, JR., M.: I support this new fine print note (FPN) for safety reasons. I believe it would be more informative if placed in locations in the NEC where the product is permitted. However, since it was submitted for this location, and it is very important information, I am voting affirmative.

Steel conduit and tubing are recognized as equipment grounding conductors per 250.122. However, there are times that a supplemental (wire) equipment grounding conductor is specified by the designer or installer for various reasons.

In the listing for FHIT systems (electrical circuit protective systems) which are used to protect masonry, UL has determined that where the user or designer chooses to install an enclosed equipment grounding conductor it must be sized in accordance with 250.122, AND the insulation material type must be the same as that of the fire-rated circuit integrity cable. Use of other types of insulation on the enclosed equipment grounding conductors or bare conductors can constitute a safety hazard and violates the fire-ratings listing of the system in the event of a fire. Compatibility of materials in a fire-rated system is of concern to UL. Some materials can provide carbon residue that is conductive or can generate conductive gases that can cause premature failure.

I would emphasize that neither the Code nor the Listing requires a ground wire when the system is installed in metal conduit or metal tubing.

**Panel Meeting Action:** Accept in Principle

In the proposed text, editorially correct the term “grounding conductor” to “equipment grounding conductor” in the FPN.

**Panel Statement:** Editorial correction to the FPN.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**Comment on Affirmative:**


This proposed FPN has had public review and should not be considered new material for as the concept in Proposal 5-257 was to bring an awareness for selecting the proper ground wire for fire rated circuits as outlined in the UL guide.

5-139 Log #493 NEC-P05 Final Action: Accept (250.119)

**Submitter:** Milton Dean, North Carolina Department of Transportation

**Comment on Proposal No:** 5-265

**Recommendation:** I concur with the panel’s statement. While the submitter points out there is a UL listing for traffic signal cable, he fails to acknowledge that no other UL standards exist for other traffic signal components.

**Substantiation:** The NEC requires equipment to be approved by the authority having jurisdiction. Most authorities require listing or labeling by a third party testing agency. In North Carolina, we request electrical inspections of the service entrance conductors and the disconnecting means. Traffic signal equipment and its installation is inspected by the Dept. of Transportation personnel.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**Comment on Affirmative:**


This proposed FPN has had public review and should not be considered new material for as the concept in Proposal 5-257 was to bring an awareness for selecting the proper ground wire for fire rated circuits as outlined in the UL guide.

5-140 Log #1966 NEC-P05 Final Action: Accept (250.119 Exception (New))

**Submitter:** Noel Williams, Herriman, UT

**Comment on Proposal No:** 5-264

**Recommendation:** This Proposal should have been Accepted or Accepted in Principle. If the panel is concerned about the proposal being overly broad, the following revised text would address that issue and still resolve the conflict with long-standing standardized color codes in signaling and communications:

**Exemption:** Where equipment is connected by a multiconductor cable and is not required to be grounded in accordance with 250.112(1) or Chapter 8, the color green may be used for other than grounding conductors.

**Substantiation:** Standard color-coding for Class 2 thermostat circuits and cables uses green as the ungrounded conductor that controls the fan in HVAC equipment. This has been a standardized practice for decades. Also, green is used as identification in many communications circuits and cables. For example, Cat 5 cable includes a green pair that is not intended for use as grounding conductors. This Cat 5 cable is permitted to be used as a substitute for Class 2 or 3 cable or for fire alarm cable according to Articles 725 and 760. No substantiation to overturn these long-standing standards and practices was ever submitted when this section was revised in the 2005 NEC. It appears that this problem was not even considered. As a result, installers and inspectors of such installations are forced to refer to the NEC or the installation instructions for listed equipment that uses such cables and color codes. See also the comment on negative by Mr. Dobrowsky. The language referring to Chapter 8 is probably not necessary as this requirement does not apply anywhere according to 90.3.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel action and statement on Comment 5-141.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**Comment on Affirmative:**

HAMEL, D.: I see my explanation of affirmative vote on Comment 5-141.
5-141 Log #603 NEC-P05 Final Action: Accept in Principle (250.119(D) (New))

**Submitter:** Henry A. Jenkins, Wake County, Inspections Development

**Comment on Proposal No:** 5-265  
**Recommendation:** Add a new subsection (D) to 250.119 as follows:  
(D) Circuits of Less than 50 Volts. Circuits of less than 50 volts shall be permitted to use a conductor with green insulation or a conductor with green insulation with one or more yellow stripes for other than grounding purposes.

**Substantiation:** While the submitter of Proposal 5-265 has identified an issue with low voltage lighting, a panel of the NEC-P05 has rejected the proposal. The submitted text suggests a need for changes to ensure the effective ground-fault return device will work as intended. The panel stated when rejecting the proposal, "Aluminum conductors with green insulation can experience failure under different soil conditions." There is similar wording for grounded conductors in 200.7(B) permitting the white, gray, or white with three colored insulated conductor to be used for other than the grounded conductor. This same permission must be applied to the green conductor and was probably just an oversight by Panel 5 during the 2005 process. This change will not adversely affect safety since it has been done in various systems for many years without any adverse problems. This new text would not be "new" material since the issue was actually dealt with in this proposal but rejected by the panel. This proposed text will permit the use of this green insulated conductor for any low voltage system at less than 50 volts, including traffic signaling systems installed as premises wiring.

**Panel Meeting Action:** Accept in Principle  
**Recommendation:** Add a new exception to 250.119 (main body) to read as follows:  
Exception: Power limited, Class 2, or Class 3 circuit cables containing only conductors, it shall not be required to use a conductor with green insulation for other than grounding purposes.

**Panel Statement:** The addition of this exception addresses the submitter’s concerns.

**Number Eligible to Vote:** 15  
**Ballot Results:** Affirmative: 15  

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5-134 Log #2349 NEC-P05 Final Action: Accept in Principle (250.122)

**Submitter:** Alan Manche, Square D Company  
**Comment on Proposal No:** 5-274  
**Recommendation:** Revise NEC 250.122 with the additions (underlined) and deletions (strike through) as shown. The entire text of 250.122(A) is shown for clarity, but only those changes shown underlined or strike through are part of this proposal.

250.122 Size of Equipment Grounding Conductors.  
(A) General. Copper, aluminum, or copper-clad aluminum equipment grounding conductors of the wire type shall not be smaller than shown in Table 250.122 but shall not be required to use a conductor with green insulation or a conductor with green insulation with one or more yellow stripes for other than grounding purposes.

**Panel Meeting Action:** Accept in Principle  
**Recommendation:** Revise the first sentence of 250.122(A) to read as follows:  
250.122 Size of Equipment Grounding Conductors.  
(A) General. Copper, aluminum, or copper-clad aluminum equipment grounding conductors of the wire type shall not be smaller than shown in Table 250.122, but in no case shall they be required to be larger than the circuit conductors supplying the equipment. Where the conductor supplying the equipment shall not be larger than 14 AWG, the equipment grounding conductor shall not be required to be larger than the circuit conductor.

**Panel Statement:** This change addresses the concerns of the submitter.

**Number Eligible to Vote:** 15  
**Ballot Results:** Affirmative: 15  

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5-142 Log #1674 NEC-P05 Final Action: Reject (250.120(B))

**Submitter:** Phil Simmons, Olympia, WA  
**Comment on Proposal No:** 5-269  
**Recommendation:** Accept this Proposal.

**Substantiation:** Experience has shown that aluminum conductors fail at a high rate when installed in direct-burial applications. When the bad section of the aluminum conductor is dug up, it is found the aluminum conductor has deteriorated and has become a white powder. This white powder is not conductive and as a result, the circuit opens.

If this happens to energized conductors, there will be some indication of the problem as equipment will not work properly. When this happens to equipment grounding conductor, the conductor fails with no indication of an open circuit until the conductor is called upon to carry fault current and it doesn’t. This open circuit can result in equipment being at a dangerous voltage above ground if there is a ground fault to equipment beyond the point of the break in the aluminum conductor.

This issue was recently mentioned to a group of journeyman electricians. One of them volunteered that they make repairs to failed aluminum conductors every week so this is a widespread problem. The panel stated when rejecting the proposal, “Aluminum conductors with green insulation can experience failure under different soil conditions.” This issue has been known to cause ground faults or other problems with high regularity in spite of code compliant installations. It is fallacy to assume every installation recommendation and new text would not be accepted to ensure the effective ground-fault return path required by 250.4.

**Panel Meeting Action:** Reject  
**Panel Statement:** No field evidence has been provided to indicate that properly installed insulated aluminum conductors listed for direct burial are not suitable for use in that application.

**Number Eligible to Vote:** 15  
**Ballot Results:** Affirmative: 14 Negative: 1  

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5-144 Log #709 NEC-P05 Final Action: Reject (250.122(A))

**Submitter:** Dean Negrelli, Wiremold/Legrand  
**Comment on Proposal No:** 5-272  
**Recommendation:** The Panel should accept in principle and add the words “Listed (Classified)” before “cable tray” in the second sentence as follows (note that the text is taken from 2008 ROP Draft):

Where a listed (classified) cable tray, a raceway, or a cable armor or sheath is used as the equipment grounding conductor, as provided in 250.118 and 250.134(A), it shall comply with 250.4(A)(5) or (B)(4); [ROP 5-272]

**Substantiation:** Only cable tray Listed (Classified) by a qualified testing laboratory should be used as an equipment grounding conductor. Listing/Classification ensures the cable tray has been investigated for this purpose. Listing/Classification also ensures the appropriate instructions and hardware are provided to create a reliable equipment grounding conductor.

**Panel Meeting Action:** Reject  
**Panel Statement:** Section 250.118(11) requires cable tray used as an equipment grounding conductor to meet the requirements of 392.7. In 392.7 the term used for sections of cable tray is identified. There are also requirements for fittings and cross-sectional area. Including cable tray in 250.122(A) is mandating the performance requirements of 250.4. The point of the second sentence in 250.122(A) is that the equipment grounding conductors of aluminum conductors are not of the wire type meet the performance requirements of 250.4.

**Number Eligible to Vote:** 15  
**Ballot Results:** Affirmative: 15
Submittal: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 5-272

Recommendation: Revise text to read as follows:

"Where ☐ cable tray, ☐ raceway, ☐ cable armor, or ☐ cable sheath, that qualifies as an equipment-grounding conductor in accordance with 250.118."

Substantiation: While Mr. Daniel Leaf has a point in adding this means of grounding, it is patently true that not all raceway, or cable armor installations constitute suitable grounds—not just cable trays. At first, it seemed that the CMP majority was right and Messrs. Chuck Mello and Martin Brett were worrying unnecessarily. However, on reflection, I believe the reminder is worthwhile, but a more-general reminder. I have come on too many installers who assumed that any armor must be a good and legal ground. Their hearing about the new type of MC cable, I fear, will only add to their confusion. Deletion of the “a”s is just an editorial suggestion. The particular language I suggest here is the TCC’s, from 3-5 Log #1532.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 5-144.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

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Submittal: Chuck Mello, Underwriters Laboratories

Comment on Proposal No: 5-272

Recommendation: Revise text as follows:

250.122(A) General. Copper, aluminum, or copper-clad aluminum equipment grounding conductors of the wire type shall not be smaller than shown in Table 250.122 but shall not be required to be larger than the circuit conductors supplying the equipment. Where a raceway or a cable armor or sheath or cable tray listed for the purpose is used as the equipment grounding conductor, as provided in 250.118 and 250.134(A), it shall comply with 250.4(A)(5) or (B)(4).

Substantiation: The panel should not have accepted this change without qualification. Cable tray is suitable as an equipment-grounding conductor only when Listed (Classified) and when installed with the instructions, hardware and accessories provided or specified by the manufacturer. As worded with this change, cable tray has been made equivalent to raceways where no such listing (Classification) is necessary and may lead to confusion and unsafe installations. At most the panel should have Accepted in Principle and added the appropriate qualifiers as stated above. Otherwise the panel should reject the proposal since it is incomplete and may allow unsafe installations.

Panel Meeting Action: Reject

Panel Statement: The panel assumes that this comment is related to Proposal 5-272. See panel action and statement on Comment 5-144.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

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Submittal: Dennis Downer, Morrisville, VT

Comment on Proposal No: 5-275

Recommendation: Add the following underlined text to Article 250.122(B).

(B) Increased in Size. Where ungrounded conductors are increased in size to compensate for voltage drop, correction factors for ambient temperature, correction factors for more than three current carrying conductors, or for any other reason related to proper circuit operation, equipment grounding conductors, where installed, shall be increased in size proportionately according to circular mil area of the ungrounded conductors.

Substantiation: There is no electrical theory to the requirement to increase the EGC if one designs a feeder and installs a larger conductor than is required for the purpose of future usage.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: The addition of the term “proper circuit operation” is vague and unenforceable.

The feeder designer in the substantiation is incorrect. The panel agrees that inadequate substantiation was submitted with the proposal, and it should be rejected on that basis. The panel concludes that any adjustment in size of the ungrounded circuit conductors can adversely affect the safety circuit of the system that includes the equipment grounding conductor. To eliminate any possibility of an inadequately sized equipment grounding conductor that does not meet the performance requirements of 250.4, the panel concludes that whenever the ungrounded circuit conductors are increased in size, the equipment grounding conductor must be adjusted in size proportionately. See panel action on Comment 5-152.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

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In 2002 it was changed to increase in size with no exceptions. I agree with the explanation of the negative vote that the circuit resistance will rise due to the heating affect and therefore shouldnt the EGC be increased for the same reason, to carry back any fault current when needed to trip the OCPD at the proper time interval. This same consideration should be given to adjustment factors for more than three wires in a conduit, where the wire size is increased rather than decrease the OCPD, and also for voltage drop, where the wire size is increased and the OCPD remains the size, which is what this section was intended for and was called in the 1999 NEC. 

There is also no electrical theory for this requirement to increase the EGC if one designs a feeder and installs a larger conductor than is required for the purpose of future usage, an example is shown below:

**Design Scope**

For economical reasons a feeder is to be designed for 200 Amps to accommodate any future tool/equipment which can utilize the full 200 Amp feeder. An existing 100A tool/equipment which is being utilized today will be connected to the designed new feeder for the future 200 Amp loads, but we will protect/fuse the feeder for 100 Amps.

- Per Table 310.16, a 200 Amp feeder at 75 degree C requires the phase conductors to be #3/0 AWG Cu (167,800 cir mils)
- Per Table 250.122, the ground conductor shall be #6 AWG Cu (26,240 cir mils)

**Question**

Per 250.122/B, “Where ungrounded conductors are increased in size…” Does the ground wire need to be increased in size if the 200 Amp Feeder is fused at 100 Amps as shown below?

- 100 Amp Feeder - Per Table 310.16 phase conductor is only required to be #3 AWG Cu (52,620 cir mils)
- Per Table 250.122, the ground conductor shall be 8 AWG Cu (16,510 cir mils)
- Size Ratio: #3/0 (167,800 cir mils)/#3 (52,620 cir mils) = 3.19

If the above is a correct assumption, a new 200 Amp feeder fused with a 200 Amp fuse will require only a #6 AWG Cu ground conductor. However, a new 200 Amp feeder fused with a 100 Amp fuse must have a #2 AWG Cu ground wire. There is no electrical theory or reason why this would be a requirement.

Note: If an equipment grounding conductor is not installed in the conduit, the conduit is utilized as the equipment grounding conductor, can the 200 Amp feeder (3/0 AWG Cu Cable) be fused with a 100 Amp Fuse? By the language in 250.122/B today, this only applies to where an EGC is installed.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel action and statement on Comment 5-147.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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**5-150 Log #800 NEC-P05 Final Action: Reject**

**Comment on Proposal No:** 5-276

**Submission:** Richard E. Loyd, Sun Lakes, AZ

**Recommendation:** The proposed change would not represent safe practice. It is also obvious that not all ampacity adjustments result in an increase in circuit conductor sizes. Often, this is due to derating starting from the 90°C ampacity of the conductors. However, where ampacity adjustments of circuit conductors result in an increase in size, the equipment grounding conductor must also be increased in size as has been required in the Code for safety.

**Panel Meeting Action:** Accept

**Panel Statement:** See panel action and statement on Comment 5-152.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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**5-153 Log #1910 NEC-P05 Final Action: Accept**

**Comment on Proposal No:** 5-284

**Submission:** Frederic P. Hartwell, Hartwell Electrical Services, Inc.

**Recommendation:** Accept the proposal, or, at a minimum, revise the paragraph as follows:

(D) Motor Circuits. Where the overcurrent device consists of an instantaneous-trip circuit breaker or motor short-circuit protector, as allowed in 430.52, the equipment grounding conductor shall be permitted to be sized not smaller than that given by Table 250.122 using the maximum permitted size of a time-delay fuse selected for short-circuit and ground-fault protection in accordance with 430.52(C)(1) Exception No. 1.

**Substantiation:** This comment works from information provided in the comments in the voting. It clarifies that the dual-element fuse parameter is based on the next higher standard size rule, which is usually how such fuses are actually selected in the field.

**Panel Meeting Action:** Accept

**Panel Statement:** See panel action in paragraph (D). Add new language to the section as follows:

(D) Motor Circuits. Equipment grounding conductors for motor circuits shall be sized in accordance with (D)(1) or (D)(2).

(D)(1) General: The equipment grounding conductor size shall not be smaller than determined by 250.122(A) based on the rating of the branch circuit short-circuit and ground-fault protective device.
(2) Instantaneous-Trip Circuit Breaker and Motor Short-Circuit Protector.
Where the overcurrent device is an instantaneous-trip circuit breaker or a motor short-circuit protector, the equipment grounding conductor shall be sized not smaller than that given by 250.122(A) using the maximum permitted rating of a dual element time-delay fuse selected for branch-circuit short-circuit and ground-fault protection in accordance with 430.52(C)(1), Exception No. 1.

Panel Statement: The proposed comment was restructured to comply with the NEC Style Manual. The revised text meets the submitter’s intent.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-154 Log #341 NEC-P05
(250.146(A))

Final Action: Reject

Submitter: Bryan P. Holland, City of North Port

Comment on Proposal No: 5-298

Recommendation: Revise proposal to state:
At least one of the insulated retaining washers shall be removed from receptacles that... OR. At least one of the retaining washers of insulated materials shall be removed from receptacles that...

Substantiation: The revised wording meets both the intent of the original proposal while also resolving the statement made by the panel.

Panel Meeting Action: Revert

Panel Statement: The panel reaffirms its original action and statement on this proposal and concludes that the additional revision proposed on this comment does not add clarity or improve the usability of this section.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-155 Log #337 NEC-P05
(250.146(D))

Final Action: Accept

Submitter: Michael J. Johnston, Plano, TX

Comment on Proposal No: 5-301a

Recommendation: Continue to accept the proposal but revise the last sentence as follows:
This equipment grounding conductor shall be permitted to pass through one or more panelboards, boxes, wireways, or other enclosures without connection to the panelboard grounding terminal as permitted in 408.40. Exception, so as to terminate within the same building or structure directly at an equipment grounding conductor terminal of the applicable derived system or service. Where installed in accordance with the provisions of this section, this equipment grounding conductor shall also be permitted to pass through boxes, wireways, or other enclosures without being connected to such enclosures.

Substantiation: The revised wording does not add new information. The proposal, as accepted, inadvertently created a wording issue with the existing text. By adding the new sentence, the concept of equipment grounding conductors through enclosures other than panelboards alone, is retained which was the original intent of the proposal. The comment is intended to be editorial revisions for clarity. Adding the word “equipment” provides clarification for users as to which conductor is referenced in these requirements, since the term “grounding conductor” is a specifically defined term.

Panel Meeting Action: Accept

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-156 Log #2084 NEC-P05
(250.146(D))

Final Action: Reject

Submitter: Chuck Mello, Underwriters Laboratories

Comment on Proposal No: 5-304

Recommendation: Revise the text as accepted by the panel on proposal 5-310a to read as follows:
250.146 (D) Isolated Ground Terminal Receptacles. Where installed for the reduction of electrical noise (electromagnetic interference) on the grounding circuit, a receptacle in which the grounding terminal is purposely insulated from the receptacle mounting means shall be permitted. The receptacle grounding terminal shall be connected to an insulated dedicated equipment grounding conductor run with the circuit conductors. This dedicated equipment grounding conductor shall be permitted to pass through one or more panelboards, boxes, wireways, or other enclosures without a connection to the panelboard equipment grounding terminal bar as permitted in 408.40. Exception, so as to terminate within the same building or structure directly at an equipment grounding conductor terminal of the applicable derived system or service.

FPN: Use of an isolated dedicated equipment grounding conductor does not relieve the requirement for grounding the raceway system and outlet box.

Substantiation: The panel should reconsider the action and not reject the entire proposal outright. The receptacles can continue to be referred to as “isolated grounding receptacles” since the yoke is in fact isolated from the green equipment grounding screw provided for connecting the third (grounding) receptacle sleeve. The submitter has provided good substantiation that the term “Isolated” has created Issues and unsafe Installations In the field due to the misunderstanding of the Intended meaning of the word “Isolated”.

The change to the fine print note should be further considered and possibly use the term “dedicated” in place of “isolated” when referring to the equipment grounding conductor. In 2002 cycle the term “dedicated” was used and the panel statement at that time indicated that dedicated could be inferred to mean a separate equipment grounding conductor for each receptacle.

The term dedicated means “to set apart for a definite use” (Webster’s New Collegiate Dictionary), which is exactly what is intended. The “dedicated equipment grounding conductor” is set apart from the required equipment grounding conductor for a definite use limiting electronic noise interference. The confusion in the industry indicated by the submitter is in dealing with the insulated green wire that comes from the isolated grounding receptacle. The term “isolated” is a poor word to use and has caused great confusion and down right dangerous installations to be completed. I believe the panel action should have been to Accept in Principle and In Part. The above revised language should resolve at least some of the problems encountered. The word “equipment” was added in one location to better clarify the wording in that part since it is the equipment grounding conductor that is being referred to in this case.

Panel Meeting Action: Reject

Panel Statement: The new word “dedicated” provides no benefit to the clarity and usability of this section. The conductor used to connect to the terminal of an isolated ground receptacle is an insulated equipment grounding conductor. It has to be installed to meet the applicable provisions for this type of installation. The panel concludes that introducing an additional and undefined term in this section is not necessary and is unsubstantiated.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: MELLO, C.: The panel’s statement does not address the issue nor the substantiation. The statement that the conductor connected to the isolated ground terminal is an “insulated equipment grounding conductor” infers that the required equipment grounding conductor that connects to the raceway, box and other equipment is not insulated or would not be permitted to be insulated. This conductor being insulated is part of the requirement in 250.146(D) has nothing to do toward a solution to the poorly applied term “isolated”. The term dedicated is clearly defined in Webster’s dictionary, as brought out in the comment’s substantiation, and in accordance with the NEC Style Manual any term not specifically defined in the Code uses standard dictionary definitions. It should be pointed out that the term “dedicated” is used in the NEC 35 times without specific definition. It is used in various contexts such as “dedicated branch circuit”, “dedicated space”, and “dedicated strut” among others. If the term dedicated, meaning “for a specific purpose or use” is understood for these 35 applications, how can the panel say the term is “undefined” and would not be understood to differentiate the “insulated equipment grounding conductor” installed for a special purpose from the one required to meet the required raceway, equipment and other equipment grounding requirements? The original proposal submitter has over several cycles provided substantiation of a problem with the term “isolated” and has provided evidence of serious safety issues because of misunderstanding of that term.
5-158 Log #520 NEC-P05 Final Action: Reject
(250.166(A))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 5-311
Recommendation: Accept the proposal.
Substantiation: If the largest conductor is 2 AWG copper, an aluminum 2 AWG conductor may be used per the present text. Which infers a difference in conductivity is irrelevant. Table 250.66 for ac systems applies to different sizes for copper and aluminum which infers conductivity is not equal.
Panel Meeting Action: Reject
Panel Statement: Vote. It appears that he understands the dangers involved.

5-159 Log #519 NEC-P05 Final Action: Accept
(250.168)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 5-313
Recommendation: Accept as revised:
Direct Current System Bonding Jumper. For direct-current systems that are to be grounded an unspliced bonding jumper shall be used to connect the equipment grounding conductor(s) to the grounded conductor at the source or the first system disconnecting means where the system is grounded. For direct-current systems, the size of the bonding jumper shall not be smaller than the system grounding electrode conductor specified in 250.166 and shall comply with the provisions of 250.28(A), (B), and (C).
Substantiation: 250.168 prescribes the size for a bonding jumper, but there is no section that REQUIREs one. Is it optional? Without a bonding jumper there is no effective ground-fault current path required by 250.2. 250.28 doesn’t seem to apply since (D) of that section refers to Table 250.66 which is for ac systems. 250.34(C) doesn’t cover dc generators since it relates to grounding in 250.26 for ac systems.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-160 Log #1502 NEC-P05 Final Action: Accept
(250.184(A)(1))

Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc
Comment on Proposal No: 5-316
Recommendation: Technical Correlating Committee Task Group on the definition of “Neutral Conductor” concurs with the panel action on this proposal.
Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.” Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC), Paul Dobrowsky (CMP 5), Walter Skuggev (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP2), Jim Daly (CMP 6, CMP 7, TCC), Bill Laiddler (CMP 6), and Oran Post (CMP 6). The TCC directed that the action on this proposal be sent to the TG for review and comment.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

5-161 Log #1682 NEC-P05 Final Action: Reject
(250.184(A)(1) Exception No. 1, No. 2, and No. 3)

Submitter: Donald W. Zipse, Electrical Forensics, LLC
Comment on Proposal No: 5-318
Recommendation: Delete Section 250.184(A)(1) Exception No. 1, Exception No. 2, and Exception No. 3.
Substantiation: Please read Mr. Elliott Rappaport’s Explanation of Negative vote. It appears that he understands the dangers involved.
Please continue your Panel Statements as I assure you I will address all of them in the next cycle.
Let us look at 250.184(A)(1), Exception No. 1, which states, “Bare copper conductors shall be permitted to be used for the neutrals of service entrances and the neutral of direct-buried portions of feeders.” This allows bare conductors for certain applications.
Now look at 250.184(B)(7), which states, “The neutral, where provided, shall be insulated and isolated from earth except at one location.” It sure seems to me that there is a conflict between the two statements.
In addition, first thing is there is no single point grounded system when it comes to utility services since the utility grounds the neutral at the transformer and possibly again at the meter. In addition the NEC requires the neutral to be grounded at the service entrance. SO WHERE IS THIS SINGLE POINT GROUNDED ELECTRICAL (SERVICE) SYSTEM? Only when the system originates after the service with the installation of another transformer. It would be great if the panel could have the ability to think outside the electrical circuit instead of thinking with blinders on and compartmentalize the circuit to fit their desires.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree that a conflict exists between the statements pointed out by the submitter. The exceptions in 250.184(A)(1) apply to the insulation level of the neutral conductor. Paragraphs (B) and (C) specify two different ways the neutral conductor can be grounded and provide for options for the desired engineering design. Specifically 250.184(B)(7) would set neutral insulation requirements that would not allow the exceptions in 250.184(A)(1) only where the option of single point grounding is chosen. Therefore, the single point grounded system referenced in 250.184(B), if chosen, is the system that is grounded at the service or at a separately derived system. Furthermore, the NEC does not cover installations under the exclusive control of an electric utility.

ARTICLE 280 — SURGE ARRESTERS

5-162 Log #975 NEC-P05 Final Action: Accept in Principle
(280)

TCC Action: The Technical Correlating Committee directs that NFPA staff update the references to the standards as provided in the affirmative comments on vote.
Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 5-335
Recommendation: Revise as follows:
ARTICLE 280 Surge Arresters, Over 1 kV
I. General
280.1 Scope. This article covers general requirements, installation requirements, and connection requirements for surge arresters installed on premises wiring systems over 1 kV.
280.2 Uses Not Permitted. A surge arrester shall not be installed where the rating of the surge arrester is less than the maximum continuous phase-to-ground power frequency voltage available at the point of application.
280.3 Number Required. Where used at a point on a circuit, a surge arrester shall be connected to each ungrounded conductor. A single installation of such surge arresters shall be permitted to protect a number of interconnected circuits, provided that no circuit is exposed to surges while disconnected from the surge arresters.
280.4 Surge Arrester Selection. The surge arresters shall comply with all of the following:
(A) Rating. The rating of a surge arrester shall be equal to or greater than the maximum continuous phase-to-ground voltage available at the point of application.
(B) Silicon Carbide Types. The rating of a silicon carbide-type surge arrester shall not be less than 125 percent of the maximum continuous phase-to-ground voltage available at the point of application.
II. Installation
280.11 Location. Surge arresters shall be permitted to be located indoors or outdoors. Surge arresters shall be made inaccessible to unqualified persons, unless listed for installation in accessible locations.
I. General

280.1 Scope. This article covers general requirements, installation requirements, and connection requirements for surge arresters installed on premises wiring systems over 1 kV.

280.2 Uses Not Permitted. A surge arrester shall not be installed where the rating of the surge arrester is less than the maximum continuous phase-to-ground power frequency voltage available at the point of application.

280.3 Number Required. Where used at a point on a circuit, a surge arrester shall be connected to each ungrounded conductor. A single installation of such surge arresters shall be permitted to protect a number of interconnected circuits, provided that no circuit is exposed to surges while disconnected from the surge arresters.

280.4 Surge Arrester Selection. The surge arresters shall comply with 280.4(A) and (B).

(A) Rating. The rating of a surge arrester shall be equal to or greater than the maximum continuous phase-to-ground operating voltage available at the point of application.

(B) Silicon Carbide Types. The rating of a silicon carbide-type surge arrester shall not be less than 125 percent of the maximum continuous phase-to-ground voltage available at the point of application.


FPN No. 2: The selection of a properly rated metal oxide arrester is based on considerations of maximum continuous operating voltage and the magnitude and duration of overvoltages at the arrester location as affected by phase-to-ground faults, system grounding techniques, switching surges, and other causes. See the manufacturer's application rules for selection of the specific arrester to be used at a particular location.

I. Installation

280.11 Location. Surge arresters shall be permitted to be located indoors or outdoors. Surge arresters shall be made inaccessible to unqualified persons, unless listed for installation in accessible locations.

280.12 Routing of Surge Arrester Grounding Conductors. The conductor used to connect the surge arrester to line, bus, or equipment and to a grounding conductor connection point as provided in 280.21 shall not be any longer than necessary and shall avoid unnecessary bends.

III. Connecting Surge Arresters

280.21 Connection. The arrester grounding conductor shall be connected to one of the following:

(1) Grounded service conductor
(2) Grounding electrode conductor
(3) Grounding electrode for the service
(4) Equipment grounding terminal in the service equipment

280.22 Surge-Arrester Conductors. The conductor between the surge arrester and the line and the surge arrester and the grounding connection shall not be smaller than 6 AWG copper or aluminum.

280.23 Surge-Arrester Conductors. The conductor between the surge arrester and the line and the surge arrester and the grounding connection shall not be smaller than 6 AWG copper or aluminum.

280.24 Interconnections. The grounding conductor of a surge arrester protecting a transformer that supplies a secondary distribution system shall be interconnected as specified in 280.24(A), (B), or (C).

(A) Metallic Interconnections. A metallic interconnection shall be made to the secondary grounded circuit conductor or the secondary circuit grounding conductor provided that, in addition to the direct grounding connection at the surge arrester, the following occurs:

(1) Grounded Conductor Connection to Grounding. The grounded conductor of the secondary has elsewhere a grounding connection to a continuous metal underground water piping system. However, in urban water-pipe areas where there are at least four water-pipe connections on the neutral conductor and not fewer than four such connections in each mile of neutral conductor, the metallic interconnection shall be permitted to be made to the secondary neutral conductor with omission of the direct grounding connection at the surge arrester.

(2) Grounded Conductor Part of Multi-Ground Neutral. The grounded conductor of the secondary system is a part of a multi-ground neutral system or static wire of which the primary neutral conductor or static wire has at least four ground connections in each mile of line in addition to a ground to each service.

(B) Through Spark Gap or Device. Where the surge arrester grounding conductor is not connected as in 280.24(A) or where the secondary is not grounded as in 280.24(A) but is otherwise grounded as in 250.52, an interconnection shall be made through a spark gap or listed device as follows:

(1) Ungrounded or Uni-Grounded Primary Systems. For ungrounded or uni-grounded primary systems, the spark gap or listed device shall have a 60-Hz breakdown voltage of at least twice the primary circuit voltage but not necessarily more than 10 kV, and there shall be at least one other ground on the grounded conductor of the secondary that is not less than 6.0 m (20 ft) distant from the surge arrester grounding electrode.

(2) Multi-Grounded Neutral Primary Systems. For multi-grounded neutral primary systems, the spark gap or listed device shall have a 60-Hz breakdown voltage of at least twice the primary circuit voltage but not necessarily more than 3 kV, and there shall be at least one other ground on the grounded conductor of the secondary that is not less than 6.0 m (20 ft) distant from the surge arrester grounding electrode.

(C) By Special Permission. An interconnection of the surge arrester ground and the secondary neutral conductor, other than as provided in 280.24(A) or (B), shall be permitted to be made only by special permission.

280.25 Grounding Conductor Connections and Enclosures. Except as indicated in this article, surge arrester grounding conductor connections shall be made as specified in Article 250, Parts III and X. Grounding conductors installed in metal enclosures shall comply with 250.64(E).

Substantiation: Added titles where needed at all headings in accordance with the NEC Style Manual and made one correction to text of deleting the word “however” since this is not Code language.

Panel Meeting Action: Accept in Principle
Revise 2008 NEC ROP Draft of Article 280 to read as follows:

Article 280 Surge Arresters, Over 1 kV

II. Installation

280.11 Location. Surge arresters shall be permitted to be located indoors or outdoors. Surge arresters shall be made inaccessible to unqualified persons, unless listed for installation in accessible locations.

280.12 Routing of Surge Arrester Grounding Conductors. The conductor used to connect the surge arrester to line, bus, or equipment and to a grounding conductor connection point as provided in 280.21 shall not be any longer than necessary and shall avoid unnecessary bends.

III. Connecting Surge Arresters

280.21 Connection. The arrester grounding conductor shall be connected to one of the following:

(1) Grounded service conductor
(2) Grounding electrode conductor
(3) Grounding electrode for the service
(4) Equipment grounding terminal in the service equipment

280.23 Surge-Arrester Conductors. The conductor between the surge arrester and the line and the surge arrester and the grounding connection shall not be smaller than 6 AWG copper or aluminum.

280.24 Interconnections. The grounding conductor of a surge arrester protecting a transformer that supplies a secondary distribution system shall be interconnected as specified in 280.24(A), (B), or (C).

(A) Metallic Interconnections. A metallic interconnection shall be made to the secondary grounded circuit conductor or the secondary circuit grounding conductor provided that, in addition to the direct grounding connection at the surge arrester, the following occurs:

(1) Grounded Conductor Connection to Grounding. The grounded conductor of the secondary has elsewhere a grounding connection to a continuous metal underground water piping system. However, in urban water-pipe areas where there are at least four water-pipe connections on the neutral conductor and not fewer than four such connections in each mile of neutral conductor, the metallic interconnection shall be permitted to be made to the secondary neutral conductor with omission of the direct grounding connection at the surge arrester.

(2) Grounded Conductor Part of Multi-Ground Neutral. The grounded conductor of the secondary system is a part of a multi-ground neutral system or static wire of which the primary neutral conductor or static wire has at least four ground connections in each mile of line in addition to a ground to each service.

(B) Through Spark Gap or Device. Where the surge arrester grounding conductor is not connected as in 280.24(A) or where the secondary is not grounded as in 280.24(A) but is otherwise grounded as in 250.52, an interconnection shall be made through a spark gap or listed device as follows:

(1) Ungrounded or Uni-Grounded Primary Systems. For ungrounded or uni-grounded primary systems, the spark gap or listed device shall have a 60-Hz breakdown voltage of at least twice the primary circuit voltage but not necessarily more than 10 kV, and there shall be at least one other ground on the grounded conductor of the secondary that is not less than 6.0 m (20 ft) distant from the surge arrester grounding electrode.

(2) Multi-Grounded Neutral Primary Systems. For multi-grounded neutral primary systems, the spark gap or listed device shall have a 60-Hz breakdown voltage of at least twice the primary circuit voltage but not necessarily more than 3 kV, and there shall be at least one other ground on the grounded conductor of the secondary that is not less than 6.0 m (20 ft) distant from the surge arrester grounding electrode.
MELLO, C.: Subsequent to the panel meeting it was noted that the two ANSI/IEEE references to obsolete IEEE Standards C62.1 and C62.2 which have been withdrawn since 2000 due to the fact that technology used in these standards is obsolete.

280.4(B) mentions only one specific type of surge arrester “Silicon-Carboide Types”. Silicon Carbide types refer to an obsolete technology type and have not been manufactured since early 1990's. This was based on an IEEE standard C62.1-1999 (R 1994) “Standard for Gapped Silicon-Carbide Surge Arresters for AC Power Circuits” which was withdrawn in March 2000.

The word “operating” was added to be technically correct. This Comment was developed by the Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; Trees Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

5-163 Log #2319 NEC-P05 Final Action: Accept in Principle (280.4(A))

Submitter: David Beach, Gresham, OR
Comment on Proposal No: 5-335
Recommendation: Revise text to read as follows:
1. The rating of a surge arrester shall be equal to or greater than the maximum continuous phase-to-phase voltage available at the point of application.
2. Impedance- or ungrounded system. The maximum continuous voltage shall be the phase-to-phase voltage of the system.

Panel Meeting Action: Accept in Principle
Revise text to read as follows:
1. The rating of a surge arrester shall be equal to or greater than the maximum continuous phase-to-phase voltage available at the point of application.

5-164 Log #1234 NEC-P05 Final Action: Accept (280.12, 280.21, 280.22, 280.25, 280.21(B), 285.21(B))

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 5-337
Recommendation: Continue to accept the TCC Grounding and Bonding Task Group proposal 5-337 as modified and revised by the actions of CMP-5.

Substantiation: The CMP-5 revisions to the proposal have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives. It is understood that these revisions apply to both Articles 280 and 285. These articles have been restructured and reorganized as a result of action on Proposals 5-335 and 5-340 and would require correlation of these revisions resulting from CMP-5 actions on this proposal. This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; Trees Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

5-165 Log #1503 NEC-P05 Final Action: Accept (280.24(A)(1))

Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc
Comment on Proposal No: 5-344
Recommendation: Technical Correlating Committee Task Group on the definition of “Neutral Conductor” concurs with the panel action on this proposal.

Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.” Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC ), Paul Dobrowsky (CMP 5), Walter Skuggevich (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP2), Jim Daly (CMP 6, CMP 7, TCC), Bill Laidler (CMP 6), and Oran Post (CMP 6). The TCC directed that the action on this proposal be sent to the TG for review and comment.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
ARTICLE 285 — TRANSIENT VOLTAGE SURGE SUPPRESSORS: TVSS

II. Installation
285.11 Location. SPDs (surge arresters or TVSSs) shall be permitted to be located indoors or outdoors and shall be made inaccessible to unqualified persons, unless listed for installation in accessible locations.

285.12 Routing of Connections. The conductors used to connect the SPD (surge arrester or TVSS) to the line or bus and to ground shall not be any longer than necessary and shall avoid unnecessary bends.

II. Connection SPDs (Surge arrester or TVSS)
285.21 Connection. Where a SPD (surge arrester or TVSS) device is installed, it shall comply with 285.23 through 285.28.

285.23 Type 1 SPDs (Surge Arrester). Type 1 SPDs shall be installed in accordance with 285.23(A) and 285.23(B).

(A) Installation. Type 1 SPDs (surge arresters) shall be installed as follows:
(1) Type 1 SPDs (surge arresters) shall be permitted to be connected to the supply side of the service disconnect as permitted in 230.82(d) or
(2) Type 1 SPDs (surge arresters) shall be permitted to be connected as specified in 285.24.

(B) At the Service. When installed at the service, the grounding conductor of a Type 1 SPD shall be connected to one of the following:
(1) Equipment grounding terminal in the service equipment
(2) Grounding electrode conductor
(3) Grounding conductor for the service

(1) Equipment grounding terminal in the service equipment
285.24 Type 2 SPDs (TVSS). Type 2 SPDs (TVSS) shall be installed in accordance with 285.24(A) through 285.24(C).

(A) Service Supplied Building or Structure. Type 2 SPDs (TVSS) shall be connected anywhere on the load side of a service disconnect overcurrent device required in 230.91, unless installed in accordance with 230.82(b).

(B) Feeder Supplied Building or Structure. Type 2 SPDs (TVSS) shall be connected at the building or structure main disconnect in accordance with 230.91(a) anywhere on the load side of the first overcurrent device at the building or structure.

(C) Separately Derived System. The SPD (TVSS) shall be connected on the load side of the first overcurrent device in a separately derived system.

285.25 Type 3 SPDs (TVSS). Type 3 SPDs (TVSS) shall be permitted to be installed anywhere on the load side of branch circuit overcurrent protection up to the equipment served, provided the connection is a minimum 10 m (30 ft.) of conductor distance from the service panel disconnect or separately derived system main disconnect.

285.26 Conductor Size. Line and grounding conductors shall not be smaller than 14 AWG copper or 12 AWG aluminum.

285.27 Connection Between Conductors. A SPD (surge arrester or TVSS) shall be permitted to be connected between any two conductors — ungrounded conductor(s), grounded conductor, grounding conductor. The grounded conductor and the grounding conductor shall be interconnected only by the normal operation of the SPD (surge arrester or TVSS) during a surge.

285.28 Grounding Conductor Connections and Enclosures. Except as indicated in this article, SPD grounding connections shall be made as specified in 250.250, Part III. Grounding conductors installed in metal enclosures shall comply with 250.64(E).

Substantiation: A number of items are addressed in the proposed text changes.
1) Include “(surge arrester and TVSS)” after SPD as indicated in the proposed text above. The third edition of the UL 1449 product standard has recently been published with an effective date for compliance nearly three years away. Therefore, the 2008 NEC can not simply drop the TVSS and surge arrester terminology as products are still currently being manufactured using this terminology and will remain in the distributor pipeline for some time to come beyond January 1, 2008. A familiar terminology change nearly identical to this change is the revision of “light fixture” to “luminare.” This proposed text change follows the same logic to ensure a transition to the new terminology that will be transparent to the industry from the aspect of product availability being compliant with Article 285.
2) The new text in 285.23(B) is unnecessary. Do we need to explain where the grounded conductor can be installed for all other devices or circuits in the NEC? There is no guidance where to connect the grounding conductor at locations other than the service, so why is guidance required here? This actually permits (misguides) the installer to possibly connect the grounding conductor of the SPD to the grounded service conductor terminal in the equipment without any consideration if it is on an ungrounded system. Delete this new text.

3) The proposed revised text in 285.24(B) prohibits an SPD from being installed on the load side of the first feeder overcurrent device on the load side of the building disconnect. The existing text addresses where the SPD can be installed, however, it may be clarified by adding the word “anywhere” so as not to be interpreted that it must be immediately at the structure disconnect.
ARTICLE 285 Surge Protective Devices (SPDs) 1 kV or less

II. Installation

285.1 Scope. This article covers general requirements, installation requirements, and connection requirements for SPDs (surge arresters and transient voltage surge suppressors (TVSS)) permanently installed on premises wiring systems 1 kV or less.

285.2 Connection. Where a SPD shall be connected anywhere on the load side of a service disconnect overcurrent device where the main disconnect switch.

285.3 Type 1 SPDs

(A) Service Supplied Building or Structure. Type 1 SPDs shall be connected on the load side of the first overcurrent device in a separately derived system.

(B) Separately Derived System. The SPD (TVSS) shall be connected on the load side of the first overcurrent device in a separately derived system.

(C) Separately Derived System. The SPD (TVSS) shall be permitted to be installed anywhere on the load side of branch circuit overcurrent protection up to the equipment served, provided the connection is a minimum 10 m (30 ft) of conductor distance from the service disconnect panel or separately derived system disconnect.

285.4 Number Required. Where used at a point on a circuit, the SPD (surge arrester or TVSS) shall be connected to each ungrounded conductor.

285.5 Listing. A SPD (surge arrester or TVSS) shall be a listed device.

285.6 Short Circuit Current Rating. The SPD (surge arrester or TVSS) shall be marked with a short-circuit current rating and shall not be installed at a point on the system where the available fault current is in excess of that rating. This marking requirement shall not apply to receptacles.

285.11 Location. SPDs (surge arresters or TVSS) shall be permitted to be located indoors or outdoors and shall be made inaccessible to unqualified persons, unless listed for installation in accessible locations.

285.12 Routing of Connections. The conductors used to connect the SPD (surge arrester or TVSS) shall be connected to each ungrounded conductor.

ARTICLE 300 — WIRING METHODS

3-3 Log #1084 NEC-P03 Final Action: Accept (300.3)

Submitter: Jim Pauley, Square D Company

Recommendation: Continue to Reject the Proposal.

Substantiation: This comment is intended to address some of the issues raised by Mr. Guida’s negative comment and to add additional information to support the panel’s rejection of this proposal.

The reference to issues associated with 210.4 is correct. The product described by Mr. Guida in his comment is frequently used in residential applications where multi-wire branch circuits are present and the wiring arrangement does, in fact, introduce a code violation for these circuits. He is correct in his comment that 210.4 would not apply if multi-wire branch circuits are not involved.

However, there is a more serious issue that occurs with what would be permitted by this proposal. This issue relates to the disconnection/isolation of the circuit. To actually isolate a branch circuit, you need to disconnect the ungrounded conductor (i.e. turn of the CB) and disconnect the grounded conductor from the terminal bar (this is why you can only have one grounded conductor per terminal in panelboards — 408.41). With the arrangement described, the ungrounded conductor “disconnect” is in the “sub panel” and the grounded conductor “disconnect” for the branch circuit is in a separate panel. This creates an unacceptable and potentially unsafe situation since the disconnects are not located in the same place.

Part of the intent of 300.3 is certainly related to the magnetic heating effects associated with grouping/routing of conductors. However, the panel should not ignore that the section is also depended on to ensure that other problematic situations such as the disconnect issue noted above does not occur as well. If the panel allowed this as a new permission in 300.3, it then forces changes to be made in other parts of the code to compensate for the hole that opens. This change should not be made.
Recommendation: The proposal should be Accepted.

Substantiation: The panel rejected this proposal with the statement that isolated phase installations would not be permitted if the exception to 300.5(B) were to be deleted. I disagree. The exception is not needed as isolated phase installations are permitted by the wording in 300.3(B)(3). The exception adds nothing to the understanding of the code.

Panel Meeting Action: Reject

Panel Statement: Section 300.3(B)(1) Exception must remain in the NEC as a very specific application where paralleled conductors are installed in an underground installation with special permission to install isolated phase installations (all of one phase) in a nonmetallic conduit. These underground duct banks are installed in this manner to permit easy installation of these parallel conductors in cable racks in a concrete manhole. Without this exception, some AHJs might have problems with acceptance of this type of installation. Leaving it in the NEC provides clear direction on this application.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

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3-5 Log #1626 NEC-P03 Final Action: Accept in Principle (300.3(D) (New))


Comment on Proposal No: 3-13

Recommendation: This Proposal should be Accepted.

Substantiation: The panel statement states that sections 310.8 and 310.13 address the requirement for the cables to be suitable for the location in which they are installed. These sections only cover the types of insulation that may be used in each of the given locations. The only specific location that is addressed by this section is exposure to direct sunlight. This section does not give any indication of the definition of dry and wet locations. The editorial text following the definition of wet locations in the 2005 NEC Handbook states: “It is intended that the inside of a raceway in a wet location or a raceway installed underground be considered a wet location. Therefore, any conductors contained therein would be required to be suitable for wet locations.”

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 3-20a (Log# CC300).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

Comment on Affirmative: CASPARRO, P.: See my explanation of vote on Comment 3-20a.

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3-6 Log #1804 NEC-P03 Final Action: Accept in Principle (300.3(D) (New))

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 3-13

Recommendation: Accept the proposal as modified below.

(D) Listing. Cables and insulated conductors installed in enclosures or raceways shall be listed for use in wet locations where the enclosures or raceways are in wet locations.

Substantiation: By removing the words “enclosure or” it limits the requirement to the conductors in raceways and eliminate the need to have wet location listed conductors in the enclosures. The inside of an enclosure should not be considered as a wet location especially if the enclosure contains electrical components. This would mean having wet location listed electrical components inside an enclosure that is listed for a wet location. I agree with Mr. Casparro in his Explanation of Negative that Article 310 does not clearly or adequately define that the inside of the a raceway installed in a wet location is also a wet location. This explanation is more appropriate for Article 300.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 3-20a (Log# CC300).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

Comment on Affirmative: CASPARRO, P.: See my explanation of vote on Comment 3-20a.

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3-7 Log #1970 NEC-P03 Final Action: Accept in Principle (300.3(D))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 3-13

Recommendation: This Proposal should have been Accepted.

Substantiation: This proposal addresses a very common interpretation problem and belongs in Article 300 since Article 300 covers all wiring methods. Many people think the inside of a raceway or box is a different type of location than the outside of the same enclosure. A similar proposal was accepted in the 1999 NEC and then relocated in the 2002 NEC, but that section (300.5) only covers underground installations. This proposal covers all installations and all locations and is needed for clarity and uniformity. In fact, acceptance of this proposal would make the existing rule of 300.5(B) unnecessary. The panel should give more consideration to the comment on negative by Mr. Casparro. This proposal does not duplicate anything in Article 310. Article 310 requires conductors installed in wet locations to be of certain types, but does not help clarify where the wet locations are. The definition of wet locations does not help clarify the misconception that the inside of the enclosure may be a different location than outside the enclosure.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 3-20a (Log# CC300).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

Comment on Affirmative: CASPARRO, P.: See my explanation of vote on Comment 3-20a.

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3-8 Log #1837 NEC-P03 Final Action: Hold (300.4)

TCC Action: The Technical Correlating Committee directs that this comment and Proposal 3-32 be reported as “hold”.

The Technical Correlating Committee will appoint a Task Group, including members from Code-Making Panels 1, 3, and 9, to review and correlate this issue during the 2011 code cycle.

The Technical Correlating Committee Notes that Code-Making Panel 9 rejected the concept in Proposal 9-38.

In addition, the concept proposed applies beyond Chapter 3 related requirements.

Submitter: John Smith, Wire Guard, Inc.

Comment on Proposal No: 3-32

Recommendation: Add new text as follows:

300.4 Protection Against Physical Damage.

(G) Conductors Inside Electrical Boxes. Conductors, inside electrical boxes, subject to physical damage from router bits, sheet rock saws, and knives, and nonconductive coatings; such as drywall mud, paint, lacquer and enamel, must be protected during the construction process by means of a rigid cover, plate, or insert of a thickness and strength as to prohibit penetration by the above mentioned items.

Substantiation: I have been an electrician for over 30 years. During this time, I have encountered thousands of wires inside the electrical box damaged by sheetrock routers, knives, saws, mud, paint, enamel, and lacquer.

Furthermore, I have received many calls from homeowners complaining of “the smell of burning wires” or “a receptacle or switch that doesn’t work”.

What I inevitably find are damaged wires inside the electrical box. The insulation on the wires has melted due to excessive heat because the amperage rating of the wires has been compromised or lessened as a result of a nick or cut in the wires. If the homeowner hadn’t noticed the “smell of burning wires” or that the switch or receptacle was not operational”, the damaged wire would have eventually caused a fire.

Per the US Home Product Report, Appliances & Equipment, 01/02 issued by the NFPA’s Fire Analysis & Research, Quincy, MA:

The number one cause of an “Electrical Distribution Equipment” fire is a short circuit or a ground fault. Damaged conductors cause short circuits and ground faults. When the conductors are damaged the amperage rating of the conductor is compromised or lessened. This results in overheating, which results in the fire.

The form of material first ignited from an “Electrical Distribution Equipment” fire is the electrical wire or cable insulation.

There are codes in place that provide for the Integrity of Electrical Equipment and Connections 110.12(C) and Protection Against Physical Damage 300.4(A-F).

These codes specifically protect the wire at all points of vulnerability from the distribution panel up to, but not including, the point where the wires are inserted into the electrical box.

There is no code that specifically ensures the protection of the conductors after they are inserted in the electrical box.

Once the conductors are inserted in the electrical box, they are extremely vulnerable to the inevitable damage caused by sheet rock routers, sheet rock saws and knives, and nonconductive coatings; such as drywall mud, paint, lacquer and enamel.

It may be assumed that an inspection will detect damaged wires and the electrician will be required to rerun the wires. That is not always true. An inspector may not always see a damaged wire hidden in the wall or spliced. The plug in tester used during the inspection will confirm that the electrical receptacle is working even though the amperage rating of the conductor is compromised or lessened due to damage.

It may also be assumed that electricians will re-run a damaged wire that violates code 300.14 “Length of Free Conductors at Outlets, Junctions, and Switch Panels”. However, from my experience and from conversations I’ve had with many electricians, that is not what is occurring.

Please see supporting material results of Survey of Electricians conducted from 2004 through 2006.
Report on Comments A2007 — Copyright, NFPA

3-9 Log #1061 NEC-P03 Final Action: Reject
(300.4(A)(1) Exception No. 3)

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Recommendation: Add new text as follows:

Exception No. 3: Where a wood member is in contact with masonry, holes shall be permitted to be bored without protection from penetration originating from the direction of the masonry.

Substantiation: If I understood the CMP's statement correctly, they were concerned that the original proposal could be taken as authorizing unprotected holes anywhere in wood members, so long as the members were in contact with masonry at some point. The revised wording of the proposed exception eliminates this possibility.

I admit to being confused by the CMP's argument against counting multiple layers or elements of wood as the sum of their thicknesses in a particular direction, so I am unable to determine if it.

Panel Meeting Action: Reject
Panel Statement: The proposed exception is not necessary since there is not a penetration issue from the masonry side of the wood member. The text in 300.4(A)(1) is only dealing with protection issues where there is a possibility of damage from conductors installed in either cables or raceways. The only penetration issue would be from opposite side of the wood member with the edge of the bored hole required to be a distance of not less than 1/8 inch from the nearest edge.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: William Benard, State of New Hampshire, Bureau of Electrical Safety and Licensing

Comment on Proposal No: 3-31

Recommendation: Revise as follows:

(E) Cables and Raceways Installed in Shallow Grooves (Remaining text unchanged)
(F) Insulated Fittings (Remaining text unchanged)

Substantiation: This proposal needs to be accepted as amended. The panel members may not have completely understood the problem addressed in the original proposal. The intention of the proposal is to prevent accidental penetration of electrical cables and raceways under common flat roof decks. The submitter did not intend to describe a scenario where the roof deck was being replaced. Sufficient substantiation was provided to establish that this problem does, indeed, exist.

Typically, the decking would remain unchanged and in its original condition. The waterproofing and insulating material above conventional metal corrugated sheathing is the element of repair or replacement. Roofing material manufacturer's installers installed in either cables or raceways. The only penetration issue would be from opposite side of the wood member with the edge of the bored hole required to be a distance of not less than 1/8 inch from the nearest edge.

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I admit to being confused by the CMP's argument against counting multiple layers or elements of wood as the sum of their thicknesses in a particular direction, so I am unable to determine if it.

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Typically, the decking would remain unchanged and in its original condition. The waterproofing and insulating material above conventional metal corrugated sheathing is the element of repair or replacement. Roofing material manufacturer's installers installed in either cables or raceways. The only penetration issue would be from opposite side of the wood member with the edge of the bored hole required to be a distance of not less than 1/8 inch from the nearest edge.
The selection of a minimum "38.1 mm (1 1/2 in.) from the nearest surface of the roof decking where screws are likely to penetrate" was chosen after measuring a multitude of installations where 38.1 mm (1 1/2 in.) was discovered to be a minimum safe distance in a majority of installations from the protruding screw at the lowest point of the underside of the roof deck.

The original panel statement alludes to a responsibility of the "individual building trades" and an ability to stay away from electrical raceways that might be located in harms way when making repairs to a damaged building. This rerouting should not be considered as a repair but as routine maintenance. All roofing material needs to be replaced whenever that necessary. Is it the Panel's intention to indicate that whenever a roofing material is replaced the electrical wiring for the building has to be replaced as well? It would be impracticable to provide a replacement of material above a finished metal roof deck and be able to know where and when a roof could or could not penetrate the building with any one of a thousand deck screws. If any electrical wiring methods are installed within a 1 1/2 inch proximity of the underside of the metal decking, it is a sure bet that at least one electrical raceway or cable will be damaged causing a failure to the electrical system. At the very least, an overcurrent device will be called upon to hopefully prevent fire, personal injury or possible electrocution. Considering the various voltages and intrush fault currents available an imminent hazard will be present if an unqualified personnel attempts to reset the device without clearing the fault at its origin. Refer to the evidence submitted describing actual incidents. These incidents happen all too often when the faults are created over retail outlets without the retail personnel even being aware of work going on above them. There is no need to elaborate the possible hazardous scenarios that could evolve from this potential.

I submit that this problem is at least as serious as the threat recognized and addressed in the current section 300.4(D). If we are concerned about a sheetrock screw penetrating a cable adjacent to a wall stud, then we should recognize the similar hazard of a deck screw penetrating a metal raceway. The proof is in the pudding see the photos I have provided.

The cut away roofing detail exemplifies the purpose for the screw installation for roofing surface material installation, maintenance or replacement before and after electrical wiring installations. Notice the screw penetration below the underside of the metal decking. Photos exemplifying screw penetration are also provided.

Retail store maintenance representatives and service electricians confirm that re-roofing projects (replacing insulating and/or waterproofing material) causes thousands of dollars of expenditure for repairs to electrical systems damaged during membrane maintenance or repair. Copies of testimony with invoicing for repair of damage caused by screws penetrating electrical conduit is provided as evidence.

Photos (1, 2, and 3) accompanying this proposal provide evidence of damage to wiring methods in the identified area. The incident cascaded to personal injury when unqualified individuals in the retail store repeatedly attempted to reset an overcurrent device supplying a 277 volt lighting circuit without consideration to the increased hazards from the repeated short circuit.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle

Revise recommended text to read:

"(E) Cables and Raceways Installed Under Roof Decking. A cable- or raceway-type wiring method, installed in exposed or concealed locations under metal or metal-corrugated sheet roof decking, shall be smoothly rounded and supported so that the nearest outside surface of the cable or raceway is not less than 38 mm (1 1/2 in.) from the nearest surface of the roof decking.

FPN: Roof decking material is often repaired or replaced after the initial raceway or cabling and roofing installation and may be penetrated by the screws or other mechanical devices designed to provide "hold down" strength of the water-proof membrane or roof insulating material.

Exception: Rigid metal conduit and intermediate metal conduit shall not be required to comply with 300.4(E)."

Reidentify existing 2005 NEC subdivisions (E) and (F) as (E) and (G)

Panel Statement: The proposed text was revised for clarity and ease of use. Some of the wording within the proposal was informative text that fit better as a fine print note and the exception was added to cover rigid and IMC that would not suffer damage from these hold-down devices or screws. The metric measurement was changed to a hard conversion, as it is the panel's opinion that the 0.1 mm provided in the soft conversion was not critical. The code rule actually said that there would have been no reason for this proposal, however the code rule doesn't say where "conductors enter the enclosure", it says where "raceways containing conductors enter enclosures". The current wording only requires protection for ungrounded conductors #4 and larger where the raceway itself enters the enclosure. The only two raceways that actually enter the enclosure are the threaded raceways, RMC and IMC. The other raceways terminate at a connector and the connector, not the raceway enters the enclosure. The other point that this proposal attempts to address is protection for the ungrounded conductors of cables. The code doesn't now require the use of an insulated fitting to protect the ungrounded conductors of cables where they enter enclosures. If the cable jacket does not extend into the enclosure beyond the metallic cable connector, there is the same potential for problems as there is where raceways are used without an insulated bushing.

Panel Meeting Action: Accept in Principle

Revise the 2005 NEC text in 300.4(F) to read:

"Where raceways containing ungrounded conductors #4 AWG or larger ungrounded conductors and these conductors enter a cabinet, box enclosure, or raceway, the conductors shall be protected by a substantially fitting providing a smoothly rounded insulating surface, unless the conductors are separated from the fitting or raceway by substantially insulating material that is securely fastened in place."

Existing exception and second paragraph remain unchanged.

Panel Statement: The text as it was clarified to indicate that the key issue is not the raceway entering the cabinet, box, or raceway but rather the 4 AWG and larger conductors entering these enclosures being properly protected with a substantially fitting with a smoothly insulated surface.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

- 3-32 Log #2255 NEC-P03 Final Action: Accept in Principle

- 3-11 Log #1627 NEC-P03 Final Action: Accept in Principle

Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 3-34

Recommendation: The proposal should be accepted.

Substantiation: The panel rejected this proposal with a statement that said: "It covers all larger where the raceway itself enters the enclosure, or raceway, or enclosure. If the code rule actually said that there would have been no reason for this proposal, however the code rule doesn’t say where "conductors enter the enclosure", it says where "raceways containing conductors enter enclosures". The current wording only requires protection for ungrounded conductors #4 and larger where the raceway itself enters the enclosure. The only two raceways that actually enter the enclosure are the threaded raceways, RMC and IMC. The other raceways terminate at a connector and the connector, not the raceway enters the enclosure. The other point that this proposal attempts to address is protection for the ungrounded conductors of cables. The code doesn’t now require the use of an insulated fitting to protect the ungrounded conductors of cables where they enter enclosures. If the cable jacket does not extend into the enclosure beyond the metallic cable connector, there is the same potential for problems as there is where raceways are used without an insulated bushing.

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Revisit the 2005 NEC text in 300.4(F) to read:

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Existing exception and second paragraph remain unchanged.

Panel Statement: The text as it was clarified to indicate that the key issue is not the raceway entering the cabinet, box, or raceway but rather the 4 AWG and larger conductors entering these enclosures being properly protected with a substantially fitting with a smoothly insulated surface.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

- 3-32 Log #2255 NEC-P03 Final Action: Accept in Principle

- 3-11 Log #1627 NEC-P03 Final Action: Accept in Principle


Comment on Proposal No: 3-32

Recommendation: The Proposal should be Accepted.

Substantiation: See comment on Proposal 3-35.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 3-8.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 10 Negative: 3

Explanation of Negative Votes:

AYER, L.: See my Explanation of Negative Vote on Comment 3-8.

OWEN, S.: See my explanation of negative vote on Comment 3-8.

SLEIGHTS, J.: See my explanation of negative vote on Comment 3-8.

Comment on Affirmative:

CASPARRO, P.: See my explanation of vote on Comment 3-8.
Section 110-12(C) specifically addresses the need for protecting the “internal parts of electrical equipment”, and it is thus debatable whether it is applicable to or speaks to the concerns covered within Proposal 3-35. Specifically, it appears unclear as to whether Section 110.12(C) is intended to address the protection of wiring within electrical outlet boxes from damage and contamination during the construction phase. In the event that Section 110.12(C) is not to be construed so broadly as to cover damage and contamination to wiring within electrical outlet boxes. Arguing assumed that Section 110.12(C) is intended to address damage and contamination to wiring within electrical outlet boxes, it nevertheless lacks direction as to the means for implementing its mandates. Specifically, although Section 110.12(C) provides a mandate that prohibits, inter alia, the damaging of internal parts of electrical equipment, it provides no real guidance as to the measures to be taken in preventing the damage. It leaves open the possibility that electricians will use many different and varied ways of attempting to prevent contamination and damage to wiring within electrical outlet boxes in an effort to comply with Section 110.12(C). It is foreseeable that such a lack of uniformity will result in failed attempts to comply with that section, despite good faith attempts to do so. These failed attempts may in turn result in excessive costs and rework for electricians, fire damage to the premises at issue, electrical shock, and even death. An electrician may learn him or herself open to liability in the event that the method chosen by that electrician for attempting to comply with Section 110.12(C) was deemed insufficient in retrospect.

The fact that damage to and contamination of wiring and electrical components within electrical outlet boxes continues to be widespread and commonplace during the construction phase, speaks directly to the fact that Section 110.12(C) does not go far enough. It is devoid of a uniform procedure for implementing its mandates, and a uniform procedure is needed to alleviate the problem.

Proposal 3-35 provides for that uniform procedure relative to potential damage and contamination to wiring within electrical outlet boxes, and its acceptance would eliminate the guess work as to how to implement the mandates of Section 110.12(C). Proposal 3-35 complements Section 110.12(C) and provides it with the means for implementing its mandates as it applies to wiring within electrical outlet boxes. The proposal includes a requirement that a nonmetallic, temporary cover be placed on the open front of electrical outlet boxes during the construction phase. This requirement is an easy-to-implement solution to the aforementioned problem. It would shield against the plaster, spray from insulation, power routers, and paint contamination that is addressed within the language of Section 110.12(C), and that is so often present as a result of the carelessness of nonelectrical tradespersons who are eager to finish their work in a timely manner. It would provide protection so that wiring and other electrical components within electrical outlet boxes are not damaged, broken, or mutilated during the construction phase.

The concept of providing specific solutions for the protection of wiring is not foreign to the National Electrical Code. For example, Article 300 provides for very specific methods of safeguarding cables which are subject to damage during the construction phase. 300.4 requires the installation of a nail plate where cable wiring is subject to nail or screw penetration. 300.38(A)(1) requires installation of bushings or grommets on all metal edges of punched out or factory-installed holes. Article 300 also requires a minimum burial depth for underground cable installation, and additional protection when depth is reduced by the use of concrete. Proposal 3-35 supplies the National Electrical Code with the specific protection of construction-phase damage and contamination to the internal electrical wiring and components contained within electrical outlet boxes.

Proposal 3-35 would result in cost-savings to electricians who so often, at present, are required to rewire or repair electrical outlet boxes that have been damaged by others or during the construction phase, due to internal wiring and components having been left exposed. Proposal 3-35 would result in a satisfactory solution to the safety concerns that are continuously arising as a result of damaged or contaminated internal electrical wiring.

One primary purpose of the National Electrical Code is the safeguarding of persons and property, which in turn is achieved by the National Fire Protection Association’s sponsors the code-making process and publishes the National Electrical Code. Acceptance of Proposal 3-35 would be, at the very least, a definitive step in the direction of saving electricians and homeowners time and money. More importantly, it would provide a uniform and specific mandate to electricians that, when implemented, would serve as a safeguard against the loss of property due to fire damage, physical harm, and even death.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 3-8.
(300.4(G)) (New)

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 3-8.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
AYER, L.: See my explanation of Negative Vote on Comment 3-8.
OWEN, S.: See my explanation of negative vote on Comment 3-8.
SLEIGHTS, J.: See my explanation of negative vote on Comment 3-8.

Comment on Affirmative:
CASPARRO, P.: See my explanation of vote on Comment 3-8.

3-16 Log #1628 NEC-P03 Final Action: Accept in Principle

Comment on Proposal No: 3-35
Recommendation: The Proposal should be Accepted. Add the following wording to 300.4(G):
Protection of Outlet Boxes During Construction. The open front of both metal and nonmetallic electrical outlet boxes shall be temporarily covered to protect insulated electrical conductors from physical damage or deterioration due to power routers, plaster spray, spray foam insulation, and other potential damage during construction. The covers shall be constructed of a nonmetallic material and shall be clearly marked "Not For Permanent Installation".

Substantiation: Conductors inside electrical boxes during construction are physically damaged by sheet rock routers, sheet rock screws, knives, etc. When the conductors are damaged, the ampere rating of the conductor is compromised or lessened. This can cause overheating which often leads to fires.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 3-8.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
AYER, L.: See my Explanation of Negative Vote on Comment 3-8.
OWEN, S.: See my explanation of negative vote on Comment 3-8.
SLEIGHTS, J.: See my explanation of negative vote on Comment 3-8.

Comment on Affirmative:
CASPARRO, P.: See my explanation of vote on Comment 3-8.

3-17 Log #1629 NEC-P03 Final Action: Accept in Principle

Comment on Proposal No: 3-36
Recommendation: The Proposal should be Accepted.

Substantiation: See comment on Proposal 3-35.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 3-8.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
AYER, L.: See my Explanation of Negative Vote on Comment 3-8.
OWEN, S.: See my explanation of negative vote on Comment 3-8.
SLEIGHTS, J.: See my explanation of negative vote on Comment 3-8.

Comment on Affirmative:
CASPARRO, P.: See my explanation of vote on Comment 3-8.

3-18 Log #1447 NEC-P03 Final Action: Reject

Submitter: Larry Cross, IBEW Local 98
Comment on Proposal No: 3-38
Recommendation: I agree with P. Casparro that a warning ribbon placed 12 in. above the underground would alleviate this problem, thus saving unnecessary damage and possible bodily harm.

Substantiation: None.

Panel Meeting Action: Reject
Panel Statement: The basic section deals with direct burial conductors and cables with a warning ribbon to be installed 12 inches above the cables that are directly buried at 18 inches or deeper. If a metal raceway is installed for the underground installation, as requested in the proposal, there is no reason for direct-burial style conductors to be used and thus no reason to have the warning ribbon installed. Regular wet location type conductors, such as THWN which are not approved as direct buried conductors or cables, could and probably would be installed. Schedule 80 PVC could certainly be used as a protection method for underground service conductors or cables. Restricting the protection to metal conduit would not recognize this alternative protection method. A backhoe operator could damage cables or conductors in any wiring method installed, but a raceway can and does provide some level of protection for these service conductors. Direct burial cables are not protected, so a warning ribbon is a method to help identify the location for these conductors and provide some warning that service cables are located below.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-20 Log #1630 NEC-P03 Final Action: Reject

Comment on Proposal No: 3-38
Recommendation: This Proposal should be Accepted to read: (G) Service Conductors. Underground service conductors that are not encased in concrete or in metal conduit and that are buried 450 mm (18 in.), or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation.

Substantiation: Underground service conductors and conduit systems are damaged on a regular basis. To protect against this occurrence warning ribbon should be placed 12 in. above the installation. Backhoe operators and electricians can be protected from bodily harm by this inexpensive and simple procedure.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-18.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-20a Log #CC300 NEC-P03 Final Action: Accept

Submitter: Code-Making Panel 3, Comment on Proposal No: 3-42
Recommendation: Revise 300.5(B) as follows:
(B) Wet Locations. The interior of enclosures or raceways installed underground shall be considered to be a wet location. Insulated conductors and cables installed in these enclosures or raceways in underground installations shall be listed for use in wet locations and shall comply with 310.8(C). Any connections or splices in an underground installation shall be approved for wet locations.

Substantiation: There seems to be a misunderstanding in the industry about the types of conductors and splices that can be installed in enclosures or raceways in an underground installation. The requirement for using wet location listed conductors must also comply with 310.8(C) since there are three
different methods to comply with insulated conductors and cables used in wet locations. They must be:

1. Moisture-impervious metal-sheathed;
2. Types MTW, RHW, RHW-2, TW, THW, THW-2, THHW, THHW-2, THWN, THWN-2, XHHW-2, XHHW-2, or XHHW-2;
3. Of a type listed for use in wet locations.

Panel Meeting Action: Accept
Panel Statement: The text in this comment provides a clarification of the underground installation that the interior of these raceways or enclosures is considered to be a wet location. This concept was introduced in both Comments 3-21 and 3-52, but the panel decided to modify the text in 300.5(B) for underground installations since all other underground installation requirements were already located in 300.5.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Comment on Affirmative:
CASPARRO, P.: The text in this comment provides a clarification of the code for underground installations and states that the interior of these raceways or enclosures is considered to be a wet location.

3-21 Log #274 NEC-P03 Final Action: Accept in Principle (300.5(B))
Submitter: Dennis Downer, Morrisville, VT
Comment on Proposal No: 3-42
Recommendation: Revise text to read as follows:
300.5 Underground Installation.
(B) Listing Cables and insulated conductors and any splices or terminations installed in enclosures or raceways in underground installations shall be listed for use in wet locations.

Substantiation: 300.5(B) should include the wording splices or terminations to be consistent with 314.30(C). In any underground installation, all splices and terminations that are not encased in concrete or installed in a raceway or structure shall be listed as suitable for wet locations, not just in handhole enclosures without bottoms. There are numerous other application such as PVC boxes installed underground where flooding of the box could happen.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action on panel Comment 3-20a (Log #CC300).
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Comment on Affirmative:
CASPARRO, P.: See my explanation of vote on Comment 3-20a.

3-22 Log #409 NEC-P03 Final Action: Accept in Principle in Part (300.5(C))
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 3-45
Recommendation: Accept proposal revised:
UNDERGROUND CABLES UNDER BUILDINGS OR STRUCTURES. Underground cable installed under a building, or a structure, shall be in a raceway that extends beyond the concrete perimeter of the building or structure, or to the points of emergence within the perimeter of the building or structure.

Exception: A raceway shall not be required for Type MI cable.

Substantiation: Structures that are not deemed buildings but have a floor (earth or other material) should be included. Such structure may not have walls, per se but will have a perimeter. Some underground cables may not extend beyond outside walls but be terminated entirely within the perimeters of the building or structure. A raceway does not seem necessary for Type MI cable.

Panel Meeting Action: Accept in Principle in Part
Revise the 2005 NEC 300.5(C) text to read:
UNDERGROUND CABLES UNDER BUILDINGS. Underground cable installed under a building shall be in a raceway, that is extended beyond the outside walls of the building.

Panel Statement: The addition of structures was not accepted since the main reason for this subsection is to enable direct buried cables installed under a concrete slab under a building, not a structure. The addition of an exception was not accepted as it presents new material not addressed in the original proposal. The concept of “emergence within the perimeter” was accepted in principle. The deletion of the last part of the sentence clarifies that the cable installed under a building must be installed in a raceway.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-23 Log #694 NEC-P03 Final Action: Reject (300.5(D))
Submitter: Jamie McNamara, Hastings, MN
Comment on Proposal No: 3-38
Recommendation: The panel should reconsider this proposal and except it. It would add a degree of safety to people excavating around underground installations.

Substantiation: In the panel statement, it indicated that “In addition, the result of this proposal would be to delete the present 300.5(D)(2) because it has not been shown as retained, and the reason for doing so has not been provided.” It was my intent to retain all text that did not have a strike through. I used strike through to show deleted text and underline to show added text, everything else is to remain the same.

Original proposal:
300.5 Underground Installations...
(D) Protection from Damage. Direct-buried conductors and cables shall be protected from damage in accordance with 300.5(D)(1) through (D)(4) (1).

(G) Service Conductors. Underground service conductors that are not encased in concrete and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 200 mm (12 in.) above the underground installation.
(3)(g) Enclosure or Raceway Damage.... (E).
(G) Service Conductors. Underground service conductors that are not encased in concrete or in metal conduit and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-18.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-24 Log #1306 NEC-P03 Final Action: Reject (300.5(D)(3))
Submitter: David Williams, Delta Township
Comment on Proposal No: 3-47
Recommendation: Revise text to read as follows:
300.5(D)(3) Service Conductors. Underground direct buried service conductors that are not encased in concrete or installed in a raceway and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-18.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-25 Log #1445 NEC-P03 Final Action: Reject (300.5(D)(3))
Submitter: Larry Cross, IBEW Local 98
Comment on Proposal No: 3-56
Recommendation: I agree with P. Casparro that a warning ribbon placed above the underground would alleviate this problem, thus saving unnecessary damage and possible bodily harm.

Panel Meeting Action: Reject
Panel Statement: Installing a warning ribbon above underground feeder and branch circuits is permitted but not required. Anyone digging in a location where directly buried service conductors have a ribbon installed 12 inches above the cable should be warned that there is a cable below that location. Expanding this warning ribbon requirement to all service, feeder, and branch-circuit underground direct burial applications would tend to desensitize the effect of the warning ribbon.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-26 Log #1446 NEC-P03 Final Action: Reject (300.5(D)(3))
Submitter: Larry Cross, IBEW Local 98
Comment on Proposal No: 3-48
Recommendation: I agree with P. Casparro that a warning ribbon placed 12 in. above the underground would alleviate this problem, thus saving unnecessary damage and possible bodily harm.

Panel Meeting Action: Reject
Panel Statement: The panel intends that this requirement apply only to direct buried service cables and conductors. The proposal and comment have not substantiated the need to add raceways to the types of installations covered by 300.5(D)(3).
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
3-27 Log #147 NEC-P03  
(300.5(D)(3))  
Final Action: Reject

Comment on Proposal No: 3-48
Recommendation: I agree with the explanation of negative on this proposal.
Substantiation: As a journeyman wireman in the field, I see many times excavation work being performed on a building premises which would be on the load side of the service point. The call before you would not necessarily find these underground installations. I think all underground installations should have a ribbon. This would include any power or communication cables and raceways of all energy levels.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-26.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-28 Log #1623 NEC-P03  
(300.5(D)(3))  
Final Action: Reject

Submitter: Wally Harris, Atlantic Inland Inspections
Comment on Proposal No: 3-50
Recommendation: Revise the text of this Proposal to read as follows: (3) Service, Branch Circuit and Feeder Conductors. Underground branch circuit, feeder and service conductors that are not encased in concrete and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation.
Substantiation: The original proposal in the ROP should be reconsidered, and accepted.

In the Rejection statement the Panel stated in Part; “Service conductors are not protected by overcurrent protection devices and constitute a much greater hazard where these conductors are damaged during excavation.”

By including the wording “…constitute a much greater hazard” in their statement, the Panel surely recognizes that there is some degree of hazard present in Branch Circuit and Feeder conductors as well as Service conductors. The degree of hazard is not the question. The question is whether or not the “practical safeguarding of persons and property” as stated in 90.1(A) is in fact being considered by the Panel in the initial rejection of the original Proposal. Panel member Mr. Casparro asked the ultimate question in his comment in the “Explanation of Negative” in the ROP - “Can we really ever be too safe?”

I must respectfully disagree with the Panel in their statement that the presence of a warning ribbon would tend to “desensitize the effect of the warning ribbon.” The Panel also stated that “Human nature tends to disregard safety items where that person is constantly exposed too often to that safety item.”

Desensitization of human beings, and human nature are best left to members of the Medical and Psychological professions. The “…practical safeguarding of persons and property from hazards arising from the use of electricity” as stated in 90.1(A) is best left in the competent hands of the Code Panels and the industry professionals that enhance the NEC and continue to make it the benchmark for electrical work worldwide.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-25.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-29 Log #1631 NEC-P03  
(300.5(D)(3))  
Final Action: Reject

Comment on Proposal No: 3-50
Recommendation: This Proposal should have been Accepted.
Substantiation: The panel is correct in saying that service conductors are not protected by overcurrent protection and therefore constitute a much greater hazard when these conductors are damaged during excavation. I disagree with the panel statement that says “Expanding this warning ribbon requirement to all service, feeder, and branch circuit underground direct burial applications would tend to desensitize the effect of the warning ribbon.” Any type of warning device that elicits a hazard, extra work, and the expense of a repair would be valid in its use.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-25.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-30 Log #2256 NEC-P03  
(300.5(D)(3))  
Final Action: Reject

Submitter: Donald A. Ganiere, Ottawa, IL
Comment on Proposal No: 3-49
Recommendation: The panel should accept this proposal.
Substantiation: The panel statement says that if a safety rule is difficult or expensive to comply with then we don’t need it in the code. The “warning ribbon” rule is intended to provide some protection in the form of a warning ribbon to someone who is digging in the area of the underground service cable. The method of original installation does not change the level of hazard to the future digger. They are just as hurt or killed if they dig into an energized service cable that was installed using directional boring equipment as one that was installed using conventional trenching. If this is really a hazard to future workers, then they deserve the protection of a warning ribbon no matter what cable installation method was used. If it is not really a hazard, then the rule should be deleted from the code, but you can’t have it both ways. The panel statement says one is safe to the future digger and the other is a hazard, when in reality there is no difference in the level of hazard involved.

Panel Meeting Action: Reject
Panel Statement: The only way to install a warning ribbon 12 inches above a bored hole containing service conductors would be to drill an additional hole with the ribbon inserted in the hole and pulled through from one location to another or to dig a trench to a depth 12 inches above the cable. In addition, since the ribbon would be installed in a drilled hole, the inspector would not be able to verify the depth of the ribbon as being 12 inches above the service conductors. Unenforceable requirements must not be inserted into the NEC.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-31 Log #25 NEC-P03  
(300.5(D)(4))  
Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 3-52
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action taken on Proposal 8-53. This action will be considered by the Panel as a Public Comment.
See the Technical Correlating Committee action on Proposal 8-53.
It was also the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 8 for comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See the panel action and statement on Comment 3-33.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-32 Log #351 NEC-P03  
(300.5(D)(4))  
Final Action: Accept in Principle

Submitter: Code-Making Panel 8,  
Comment on Proposal No: 3-52
Recommendation: CMP-3 should Accept Proposal 3-52.
Substantiation: CMP-3 should accept Proposal 3-52 to correlate with the action taken by CMP-8 on Proposal 8-53.
This comment has been balloted through CMP-8 with the following ballot results:
12 Eligible to Vote
11 Affirmative
1 Negative
Mr. R. Loyd voted negatively stating: “Proposal 3-52 was to reject. No comment necessary, CMP-8 has no substantiation or recommendation that CMP-3 reverse their action.”
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action on Comment 3-33.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
3-33 Log #391 NEC-P03
(300.5(D)(4))

Final Action: Accept

Submitter: David H. Kendall, Carlon

Comment on Proposal No: 3-52

Recommendation: This proposal should be Accept in Principle and revised to read as follows:

300.5(D)(4) Enclosure or Raceway Damage. Where the enclosure or raceway is subject to physical damage, the conductors shall be installed in rigid metal conduit, intermediate metal conduit, Schedule 80 rigid nonmetallic PVC conduit, or equivalent.

Substantiation: Panel 8 did Accept in Principle Proposal 8-53. To be consistent with the revised Article 352 “Schedule 80 PVC conduit” should be used instead of “Schedule 80 rigid PVC conduit” as proposed.

Panel Meeting Action: Accept

Panel Statement: The panel notes that there is an inconsistency in how PVC is designated in the action taken on Proposal 8-53.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-34 Log #1063 NEC-P03
(300.5(D)(4))

Final Action: Reject

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 3-52

Recommendation: Revise text to read as follows:

“...physical damage of the sort that tends to be readily visible...”.

Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC’s explicit definitions. The NEC Style Manual says in “3.2.5.5 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology” this does not benefit the ordinary user. The Style Manual is offering an option, not a requirement. I assumed the term was being used loosely to mean damage from blows, abrasion, pressure, or tension, but assumptions should not be necessary. An ideal I believe we share is to enforce the Code as written, not “You know what we mean.” This CMP’s statement indicates that they intended the long-term physical effects of chemicals and radiation, such as embrittlement, to be among types of damage excluded. Other CMPs use the term with somewhat different intentions, if one reads the Panel Statements in this ROP. Webster’s definition does not clue us to this, nor does Article 100, nor does the beginning of this chapter. I would hope 110.3(A)(2)’s requirement of suitable “mechanical strength and durability” sufficed. If this additional statement is needed then that is too broad, let’s say exactly what the CMP statement indicates is meant.

Panel Meeting Action: Reject

Panel Statement: The submitter has not provided any additional technical substantiation to delete the word “physical” from the text in 300.5(D)(4). The panel reaffirms its panel statement from the proposal as follows: “Physical” is used throughout the NEC as a descriptive adjective to the noun “damage.” While the submitter feels the phrase “physical damage” is superfluous, the word “physical” provides a certain emphasis and a further description where combined into the phrase “physical damage.” This phrase tends to draw more attention than just “damage.” In addition, physical damage provides a description of thermal and mechanical damage where the damage can be readily identified, such as a roadway that has been physically damaged versus damage from ultraviolet light where the roadway may be more brittle and thus can be easily damaged physically by impact to the roadway. Chemicals or heat can cause unseen damage to electrical components that can eventually lead to physical damage at a later time. This phrase is used in the NEC Style Manual in 3.2.5.5 as an acceptable method to describe physical damage.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-35 Log #1371 NEC-P03
(300.5(D)(4))

Final Action: Accept in Principle

Panel Meeting Action: Accept in Principle

Panel Statement: The panel action on Comment 3-33 addresses the submitter’s concern.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-36 Log #2503 NEC-P03
(300.5(D)(4))

Final Action: Reject

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 3-52

Recommendation: Accept the proposal revised as follows.

300.5(D)(4) Enclosure or Raceway Damage. Where the enclosure or raceway is subject to physical damage, the conductors shall be installed in rigid metal conduit, intermediate metal conduit, RTRC, Schedule 80 rigid nonmetallic PVC conduit, or equivalent.

Substantiation: RTRC should be included in this list. If RTRC is not included then this proposal should be rejected. Not including RTRC in the list is not appropriate. There is no information that shows RTRC cannot also provide this function.

Panel Meeting Action: Reject

Panel Statement: Reinforced thermosetting resin conduit (RTRC) cannot be added to this section because the RTRC designation does not necessarily indicate that the conduit provides the extra physical protection as does Schedule 80 PVC.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanations of Negative:

PACE, D.: In past RTRC has been acceptable for this application. No technical substantiation has been submitted to exclude RTRC from this application. This comment should be rejected.

3-37 Log #1064 NEC-P03
(300.5(F))

Final Action: Reject

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 3-53

Recommendation: Revise text to read as follows:

“...physical damage of the sort that tends to be readily visible...”.

Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC’s explicit definitions. The NEC Style Manual saying in “3.2.5.5 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology” this does not benefit the ordinary user. The Style Manual is offering an option, not a requirement. I assumed the term was being used loosely to mean damage from blows, abrasion, pressure, or tension, but assumptions should not be necessary. An ideal I believe we share is to enforce the Code as written, not “You know what we mean.” This CMP’s statement indicates that they intended the long-term physical effects of chemicals and radiation, such as embrittlement, to be among types of damage excluded. Other CMPs use the term with somewhat different intentions, if one reads the Panel Statements in this ROP. Webster’s definition does not clue us to this, nor does Article 100, nor does the beginning of this chapter. I would hope 110.3(A)(2)’s requirement of suitable “mechanical strength and durability” sufficed. If this additional statement is needed then that is too broad, let’s say exactly what the CMP statement indicates is meant.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 3-34.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-38 Log #418 NEC-P03
(300.5(D)(4) Exception No. 2)

Final Action: Reject

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 3-57

Recommendation: Accept proposal.

Substantiation: Since isolated conductors are permitted in cables with a nonmetallic sheath, what reason is there then not to permit them in nonmagnetic raceways?

Panel Meeting Action: Reject

Panel Statement: The submitter has not addressed the situation that is at issue in this exception since this exception is dealing with conductors that are installed in parallel as permitted in 310.4 and has provided no technical substantiation for the suggested change. The use of a nonferrous raceway does not eliminate circulating currents. See the fine print note to 300.20(B).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13
EASTER, L.: The panel should have rejected the comment to require a listed compound. At the present time, there is only one company which provides a coating compound that can be used for corrosion protection. Independent evaluation and listing will provide long-term confidence in the product and integrity of the conduit system.

Panel Meeting Action: Reject

Affirmative: 11 Negative: 2

Comment on Affirmative: CASPARRO, P.: This is a step in the right direction because listed corrosion resistant compounds have been tested for both their corrosion resistivity and electrical conductivity. This will also take the guess work out for the inspectors.

TCC Action: The Technical Correlating Committee directs that this comment be reported as “Reject” to correlate with the Technical Correlating Committee action on Comment 3-40.

Submitter: Kevin McCull, Local Union #98 IBEW
Comment on Proposal No: 3-58
Rejection: Accept Proposal 3-58.

Panel Meeting Action: Accept

Affirmative: 7 Negative: 6

Explanations of Negative:

AYER, L.: At the present time, there is only one company which provides a coating compound that can be used for corrosion protection. It would not be a fair practice to allow this monopoly. Other approved products have been used for over 30 years without incident or hazard. The submitter has not provided any additional substantiation why the present methods used to protect against corrosion are not sufficient.

EASTER, L.: The panel should have rejected the comment to require a listed coating. The existing text makes it clear that an electrically conductive coating must be used where corrosion protection of field threads is necessary. The word “approved” is used in lieu of “listed” because there are many products, such as zinc rich spray paint, that will provide the intended field thread protection. There has never been any substantiation submitted to show there is a problem with the use of these types of products that have been approved for use for years but are not “listed” products. If there is a listed product available on the market, this does not preclude its use.

MAASSEN, R.: The panel should not have accepted requiring a “listed” compound for application to all field threads. The existing text makes it clear that any electrically conductive coating may be used where corrosion protection of field threads is necessary. To use a product from only one manufacturer that is presently listed is inappropriate. Also, this product remains tacky and can cause additional contamination of the surface, causing it to lose conductivity.

OWEN, S.: The existing text makes it clear that an electrically conductive coating may be used here. The word “approved” is used in lieu of “listed” because there are many products, such as zinc-rich spray paint, that will provide the intended field thread protection. There has never been any substantiation submitted to show that there is a problem with the use of these types of products that have been approved for use for years, but are not “listed” products. If there is a listed product available on the market, this does not preclude its use.

PACE, D.: The panel should not have accepted requiring a “listed” compound for application to all field threads. No substantiation was provided to show that “non-listed” compounds are a problem. Just because a product listing category exists does not mean that it is necessary to require a listing of the products used. “Listed” products may be approved for use, but there is no justification to require “listed” products only. Changes in the NEC should be well documented with appropriate substantiation to support the change. This comment should be rejected.

SANDERS, M.: The panel should have rejected the comment to require a listed coating. The term “approved” should continue to be used in lieu of “listed” because there are products, such as zinc rich pastes, that have an historical track record of providing the intended corrosion protection and intended conductivity of field cut threads.

A review of the history of this sentence (initially an exception) adoption into the Code shows 1987 acceptance of a Proposal (NEC TCR) statement that zinc chrome paste does not reduce the current carrying capacity of the conduit in (during) a fault condition and also did not challenge the use of red lead paint. During the 1990 NEC cycle, the term “identified” was accepted as being too restrictive and it was changed to “approved.” Subsequent to this, UL Product Category FOIZ was developed, a product listing was established, and in the ROP for the 2005 Code cycle the term “approved” was initially changed to “listed”, and specifically rejected adding “zinc rich compound.” During the comment period, it was pointed out the historical record of using this compound as both a corrosion inhibitor and electrically conductive agent, and that only anecdotal comments were submitted with no technical substantiation offered to reject this long standing practice. This was accepted by CMP-03, and the term “approved” was retained for the 2005 NEC. No technical substantiation has been provided in the 2008 NEC Proposal or Comment period that would prohibit the use of this long standing practice of using a zinc rich paste compound.

However, many are incorrectly assuming that any substance used on field cut threads, such as zinc rich spray paint, Teflon taping, red lead paint, and pipe dope are also acceptable. The quantity of zinc in zinc rich spray paint is unknown. Teflon tape contains no metallic particles, it is not a compound as the text of 300.6(A) specifically requires, and should never be used on electrical metallic raceway. Red lead paint was developed to resist wood decay in barns (hence the red color of barns), the quantity of metallic particles in the paint is unknown, and the lead has not been used in any galvanizing procedure subject to any listing process. Pipe dope does not contain any metallic particles and should never be used on electrical metallic raceway. Zinc rich paste has an acceptable historical track record in the type metal that does go through a listing procedure following the galvanizing process.

Comment on Affirmative: CASPARRO, P.: See my explanation of vote on Comment 3-40.

Final Action: Reject
Ballot Results: Affirmative: 11 Negative: 2

Recommendation: I agree with the submitter “listed” and delete the word approved to describe electrically conductive corrosion resistant compound.

Substantiation: None.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 11 Negative: 2

Explanation of Negative:
AYER, L.: See my Explanation of Negative Vote on Comment 3-40
EASTER, L.: See NEMA recommendation and my explanation of negative vote on Comment 3-40.

Comment on Affirmative:
CASPARRO, P.: See my explanation of vote on Comment 3-40.

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:
AYER, L.: See my Explanation of Negative Vote on Comment 3-40

Ballot Results: Affirmative: 13

Ballot Results: Affirmative: 13

Ballot Results:Affirmative: 13

Ballot Results: Affirmative: 13

Ballot Results: Affirmative: 13

Ballot Results: Affirmative: 13

Ballot Results:Affirmative: 13

Ballot Results: Affirmative: 13

Ballot Results: Affirmative: 13

Ballot Results: Affirmative: 13
Submitter: Richard Troxel, Bear Electric
Comment on Proposal No: 3-61
Recommendation: Add the following to 300.7(B) after the last sentence: (Table 352.44(A) provides expansion information for polyvinyl chloride (PVC), electrical metallic tubing (EMT), intermediate metal conduit (IMC), rigid metal conduit (RMC), and aluminum conduit.) The FPN should be deleted from this section and placed with Table 352.44(A).
Substantiation: Deleting the FPN from this section would eliminate confusion. It would be better suited with Table 352.44(A) where it will be useable.
Panel Meeting Action: Reject
Panel Statement: Table 352.44 does not provide expansion information for EMT, IMC, rigid metal conduit, and aluminum conduit, but this table can be used with a multiplier of 0.20. This fine print note must be retained within 300.7(B) for expansion fittings, since it provides necessary background information on expansion characteristics.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: Donald A. Ganiere, Ottawa, IL
Comment on Proposal No: 3-63
Recommendation: This proposal should be accepted.
Substantiation: I understand that panel’s point that conductors must be selected so that they are suitable for the locations where they are being installed. The point of this proposal is to make it clear that the interior of any raceway installed in a wet location is a wet location. That is not a completely accepted idea in the field. A section was added, 300.12, that made it clear that the interior of all underground raceways is a wet location. This is the same issue with raceways that are installed in wet locations. The interior of the raceway will be a wet location and conductors or cables installed in these raceways must be listed as suitable for use in wet locations. If the interior of a raceway in outside or wet locations is not also a wet location, why do sections 225.22 and 230.53 require that “raceways on exteriors of buildings or other structures shall be arranged to drain”? Note: This proposal covers underground raceways and raceways in wet locations and if accepted, you should also accept Proposal 3-43.
Panel Meeting Action: Accept
Panel Statement: This proposal was accepted.
Revise recommended text for 300.9 to read: 300.9 Raceways in Wet Locations Above Grade. Where raceways are installed in wet locations above grade, the interior of these raceways shall be considered to be a wet location. Insulated conductors and cables installed in raceways in wet locations above grade shall comply with 310.8(C).
Panel Statement: The panel accepts the recommendation to create a new 300.9 for aboveground wet locations and has chosen to place the underground installation requirements in 300.5(B). The text was not deleted in 300.5(B) since the 300.5 applies to underground installations. Providing additional underground requirements in a new 300.9 could be missed by the user of the Code. The requirement for using wet location listed conductors in the proposal was changed to “complying with 310.8(C)” because there are three different methods to comply with insulated conductors and cables used in wet locations: (1) Moisture-impervious metal-sheathed; (2) Types MTW, RHW, RHW-2, THW, THHW-2, THHW, THH1W-2, THWN, THWN-2, XHHW, XHHW-2, ZW; or (3) Of a type listed for use in wet locations.
See the panel action and statement on Comment 3-20a (Log #CC300). Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Comment on Affirmative: CASPARRO, P. See my explanation of vote on Comment 3-20a.

Accept the recommendation to relocate the new exception to 300.12 and revise the exception to read:
“Exception No. 2: Raceways and cables installed into the bottom of open bottom equipment, such as switchboards, motor control centers, and floor or pad-mounted transformers, shall not be required to be mechanically secured to the equipment.”
Identify the current exception to 300.12 as Exception No.1.
Panel Statement: The submitter is correct that a better place for this text is in 300.12 for mechanical continuity. “Floor and pad-mounted” was added to differentiate between a wall mount transformer and a floor or pad-mounted transformer, and the existing exception was relabeled as Exception No. 1.
The term “raceway” has been used to include all of the raceways covered in Chapter 3, and the panel has also included cables in the exception for consistency.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 3-67
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 9 for action in Article 314. This action will be considered by Code-Making Panel 9 as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: Panel 9 understands this comment to be a direction to consider action in Article 314. After reconsideration, Panel 9 respectfully declines to take this action. See panel action and statement on Comment 9-4.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 9-7d
Recommendation: The Technical Correlating Committee directs that the panel reconsider this Proposal since boxes for power-limited fire alarms are not excluded from Article 314 by any rules from Article 760. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: After reconsideration, CMP 9 respectfully declines to incorporate the subject of Proposal 9-7d within Article 314. The submitters request is already permitted under 314.23(D)(1). CMP 9 understands the rules in 314.23 apply without modification to boxes used in fire alarm wiring within the scope of Article 760 because no modifications have been made in that article to Chapter 3 provisions in this regard. To the extent the proposal could address Article 760 systems, it is requesting that such modifications be made. CMP 9 lacks the background to evaluate whether the particular characteristics of this equipment warrant a modification of the general NEC rules with respect to enclosure support. If CMP 9 were to act on the merits of the proposal, the result would be an exception in 314.23 for certain equipment within the scope of Article 760. This sort of an exception is exactly what the Style Manual is attempting to avoid, as it recognizes the role of 90.3. This was the reason for the last sentence of the panel statement on Proposal 9-7d.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Accept the recommendation to relocate the new exception to 300.12 and revise the exception to read:
“Exception No. 2: Raceways and cables installed into the bottom of open bottom equipment, such as switchboards, motor control centers, and floor or pad-mounted transformers, shall not be required to be mechanically secured to the equipment.”
Identify the current exception to 300.12 as Exception No.1.
Panel Statement: The submitter is correct that a better place for this text is in 300.12 for mechanical continuity. “Floor and pad-mounted” was added to differentiate between a wall mount transformer and a floor or pad-mounted transformer, and the existing exception was relabeled as Exception No. 1.
The term “raceway” has been used to include all of the raceways covered in Chapter 3, and the panel has also included cables in the exception for consistency.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
The main text did not permit a raceway to support other raceways, cables, or non-electric equipment in accordance with 314.23 or to support luminaires (fixtures) in accordance with 300.15(C). This is because the wire to be shortened or install the raceways or cables on the additional support wire before the support wire is tied to the ceiling grid assembly. Where ceiling support wires are shortened by installing raceway or cable support clips or devices to the wire, removing the raceway or cable support clip and not providing any additional support could cause damage to the raceway or cable and the internal conductors, which very easily could be a life safety or fire issue.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-55 Log #2036 NEC-P03
Final Action: Reject
(300.11(B))

Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 3-70
Recommendation: Accept proposal as submitted.
Substantiation: The panel statement first indicates that raceways are not tested nor listed for external mechanical load carrying conditions. If that is the case, it is difficult to understand why the text in the section allows these raceways to support other raceways, cables or nonelectric equipment under the conditions in (2) and (3). I assume that item (1) is included so a raceway manufacturer has the ability to submit their product to a certification body and have it evaluated for that purpose. As indicated in the original proposal and Mr Ayer’s negative ballot, the items included in (3); boxes, conduit bodies, and luminaries are not raceways, cables or nonelectric equipment. Please provide clarification of the panel intent.

Panel Meeting Action: Reject
Panel Statement: To clarify the text of this particular subsection, it is necessary to go back to the original text as accepted for the 1987 NEC. The original text was as follows:

300-11(b) Raceways Used as Means of Support. Raceways shall not be used as a means of support for other raceways, cables or non-electric equipment.

Exception No. 1: Where the raceway or means of support are identified for the purpose.

(FPN): See Article 318 for cable trays.

Exception No. 2: Raceways containing power supply conductors for electrically controlled equipment shall be permitted to support Class 2 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits.

Exception No. 3: As permitted in 370-23 for boxes or conduit bodies or 410-16(f) for fixtures.

The panel did not permit a raceway to support other raceways, cables, or non-electric equipment; however, the first exception permits a raceway or means of support where identified for the purpose. The non-electric equipment referred to the main text and subsequently in the first exception was a reference to a cable tray system defined as “a unit or assembly of units or sections and associated fittings forming a structural system used to securely fasten or support cables and raceways. The cable tray is non-electric equipment that is for supporting cables and raceways but is identified for that purpose. The text was changed from a section with exceptions to positive text without any exceptions but with the same general purpose to permit cable trays as a means of support for cables and raceways. The present text appeared as follows:

300.11(B) Raceways Used as Means of Support. Raceways shall be used only as a means of support for other raceways, cables, or non-electric equipment under any of the following conditions:

1) Where the raceway or means of support is identified for the purpose.
2) Where the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits.
3) Where the raceway is used to support boxes or conduit bodies in accordance with 314.23 or to support luminaires (fixtures) in accordance with 410.16(F)."

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-56 Log #421 NEC-P03
Final Action: Reject
(300.11(C))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 3-12
Recommendation: Accept proposal revised:
Cable wiring methods shall not be used as a means of support for other cables, raceways, or non-electrical equipment unless identified for the purpose.
Substantiation: This section should also apply to equipment that is electrical.
Panel Meeting Action: Reject
Panel Statement: The proposal number should be 3-72, not 3-12. See the panel action and statement on Comment 3-55.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-57 Log #1065 NEC-P03
Final Action: Reject
(300.12 Exception No. 1)

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 3-75
Recommendation: Revise text to read as follows:

“physical damage of the sort that tends to be readily visible...”

Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC’s explicit definitions. The NEC Style Manual saying in “3.2.5.5 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology” this does not benefit the ordinary user. The Style Manual is offering an option, not a requirement. I assumed the term was being used loosely to mean damage from blows, abrasion, pressure, or tension, but assumptions should not be necessary. An ideal I believe we share is to enforce the Code as written, nor “You know what we mean.” This CMP’s statement indicates that they intended the long-term physical effects of chemicals and radiation, such as embrittlement, to be among types of damage excluded. Other CMPs use the term with somewhat different intentions, if one reads the Panel Statements in this ROP. Webster’s definition does not clue us to this, nor does Article 100, nor does the beginning of this chapter. I would hope 110.3(A)(2)’s requirement of suitable “mechanical strength and durability” sufficed. If this additional statement is needed because that is too broad, let’s say exactly what the CMP statement indicates is meant.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-34.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-58 Log #1066 NEC-P03
Final Action: Reject
(300.15(C))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 3-77
Recommendation: Revise text to read as follows:

“physical damage of the sort that tends to be readily visible...”

Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC’s explicit definitions. The NEC Style Manual saying in “3.2.5.5 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology” this does not benefit the ordinary user. The Style Manual is offering an option, not a requirement. I assumed the term was being used loosely to mean damage from blows, abrasion, pressure, or tension, but assumptions should not be necessary. An ideal I believe we share is to enforce the Code as written, nor “You know what we mean.” This CMP’s statement indicates that they intended the long-term physical effects of chemicals and radiation, such as embrittlement, to be among types of damage excluded. Other CMPs use the term with somewhat different intentions, if one reads the Panel Statements in this ROP. Webster’s definition does not clue us to this, nor does Article 100, nor does the beginning of this chapter. I would hope 110.3(A)(2)’s requirement of suitable “mechanical strength and durability” sufficed. If this additional statement is needed because that is too broad, let’s say exactly what the CMP statement indicates is meant.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-34.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Report on Comments A2007 — Copyright, NFPA

3-59 Log #1912 NEC-P03 Final Action: Accept (300.15(Ll))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 3-79

Recommendation: Accept the proposal.

Substantiation: The panel statement is at odds with customary trade practice. Relatively few handholes contain boxes to enclose splices. Instead, the handholes rely on the fact that the typical cover requires tools to open, either because of bolts made-up wrench tight, or (unusual for a handhole) a cover over 100 lbs. This is also a requirement in 314.30(D). Nevertheless, most handholes are accessible to the public. In fact, handhole strength ratings are based on whether they will be driven over or just walked over. By acceptable, I mean that members of the public can walk/dance on top of the cover, not that the public can get into the interior of the enclosure. A requirement to supplement the handhole enclosure with some kind of wet-location inner box for any handhole enclosure in public spaces simply because someone may have the requisite tools is excessive. Remember, whoever gets into the handhole enclosure will also have to open the tools enclosed box, even more easily.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 1

Explanation of Negative: PACE, D: Accepting this comment thus, accepting the original proposal, would allow conductors to be run in manhole or hand hole enclosures that are accessible to un-qualified persons without being required to be run in a box or conduit body. This reduces the level of safety for this type installation and potentially places un-qualified persons at risk for injury when they have no way of knowing or understanding the hazards. This comment should be rejected.

3-60 Log #437 NEC-P03 Final Action: Accept in Principle (300.16(A))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 3-80

Recommendation: Accept addition of "conduit body" after "box" and revise last sentence: A fitting other than a conduit body used for this purpose shall contain no splices or taps...(remainder unchanged).

Substantiation: Conduit bodies with three or more hubs are suitable. 590.4(G) recognizes conduit body as suitable. The definition of fitting in Article 100 includes conduit bodies. 314.16(C) permits splices in conduit bodies without special permission.

Panel Meeting Action: Accept in Principle

Panel Statement: Revise the existing text of 300.16(A) as follows:

300.16 Raceway or Cable to Open or Concealed Wiring (A) Box, Conduit Body, or Fitting. A box, conduit body, or terminal fitting having a separately bushed hole for each conduit shall be used where a change is made from conduit, electrical metallic tubing, electrical nonmetallic tubing, nonmetallic-sheathed cable, Type AC cable, Type MC cable, or mineral-insulated, metal-sheathed cable and surface raceway wiring to open wiring or to concealed knob-and-tube wiring. A fitting used for this purpose shall contain no taps or splices and shall not be used at luminaire (fixture) outlets. A conduit body used for this purpose shall contain no taps or splices, unless it complies with 314.16(C)(2).

Panel Statement: Conduit body has been added to both the title and the first sentence in 300.16(A) since 314.17(B) permits this application for open wiring on insulators and for concealed knob-and-tube wiring. The last sentence was added to ensure that any conduit body where a splice to the wiring system is necessary also complies with 314.16(C)(2).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-61 Log #1913 NEC-P03 Final Action: Reject (300.17)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 3-81

Recommendation: Accept the proposal.

Substantiation: The panel statement is incorrect. The proposal clearly conditions the rule on the absence of a pull point at the transition. Strut-type channel raceway has pull points along its entire length, as long as the cover is removed. Surface raceways in the medium and larger sizes have removable covers as well, and only the smaller ones would be (and should be) subject to this rule. The important concept here is simply this: without this proposal a raceway method transition without a pull point can effectively nullify any XXX.26 bend limitation.

Panel Meeting Action: Reject

Panel Statement: Section 300.17 is dealing with the number and size of conductors, not the number of bends in a run. Section 300.17 has a fine print note referencing various sections for the number and size of conductors within a wiring method, so adding a second paragraph dealing with the number and degree of bends would be inappropriate.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-62 Log #28 NEC-P03 Final Action: Accept (300.17, FPN )

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 3-83

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposals 8-53 and 8-78. This action will be considered by the Panel as a Public Comment. See Technical Correlating Committee action on Proposals 8-53 and 8-78.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: CMP-3 has accepted the recommendation of CMP-8 in Comment 3-63.

Panel Statement: CMP-8 has the responsibility for raceway designations.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-63 Log #353 NEC-P03 Final Action: Accept (300.17, FPN )

TCC Action: The Technical Correlating Committee directs that the term “rigid PVC” be changed to “PVC” to correlate with the panel action on Comments 3-33 and 3-78.

Submitter: Code-Making Panel 8,

Comment on Proposal No: 3-83

Recommendation: CMP-3 should Accept Proposal 3-83 as originally proposed.

Substantiation: CMP-3 should Accept Proposal 8-3 as originally proposed to correlate with the action taken by CMP-8 on Proposals 8-53 and 8-78.

This comment has been balloted through CMP-8 with the following balloting results:

12 Eligible to Vote
11 Affirmative
1 Negative

Mr. R. Loyd voted negatively stating: “Proposal 3-83 was to Accept in Part. Not sufficient necessary, CMP-8 has no substantiation for recommending that CMP-3 change their action. There are no correlation issues with CMP-3’s action.”

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-64 Log #392 NEC-P03 Final Action: Accept in Principle (300.17, FPN )

TCC Action: The Technical Correlating Committee directs that the term “rigid PVC” be changed to “PVC” to correlate with the panel action on Comments 3-33 and 3-78.

Submitter: David H. Kendall, Carlton

Comment on Proposal No: 3-83

Recommendation: This proposal should be Accept in Principle and revised to read as follows:

FPN: See the following sections of this code; intermediate metal conduit, 342.22; rigid metal conduit, 344.22; flexible metal conduit 348.22; liquidtight flexible metal conduit, 350.22; rigid nonmetallic PVC conduit, 352.22; HDPE conduit, 353.22; RTRC conduit, 355.22; liquidtight nonmetallic flexible conduit, 356.22; electrical metallic tubing, 358.22; flexible metallic tubing, 360.22; electrical nonmetallic tubing, 362.22; cellular concrete floor raceways, 372.11; cellular metal floor raceways, 374.5; metal wireways, 376.22; nonmetallic wireways, 378.22; surface metal raceways, 386.22; surface nonmetallic raceways, 388.22; underfloor raceways, 390.5; fixture wire, 402.7; theaters, 520.6; signs, 600.31(C); elevators, 620.33; audio signal processing, 725.22; telecommunications, 770.22; interior raceways, 780.22; optical fiber cables and raceways, 770.22.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 3-63.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13
3-65 Log #1373 NEC-P03  
Final Action: Accept in Principle  
(300.17, FPN)

TCC Action: The Technical Correlating Committee directs that the term “rigid PVC” be changed to “PVC” to correlate with the panel action on Comments 3-33 and 3-78.

Submitter: William Wagner, Certification Solutions

Comment on Proposal No: 3-83

Recommendation: This Proposal should be accepted as originally proposed. FPN: See the following sections of this Code: Intermediate Metal Conduit, 342.22; Rigid Metal Conduit, 344.22; Flexible Metal Conduit, 348.22; Liquidtight Flexible Metal Conduit, 350.22; Rigid Nonmetallic PVC Conduit, 352.22; HDPE Conduit, 353.22; RTRC, 355.22; Liquidtight Nonmetallic Flexible Conduit, 356.33; Electrical Metallic Tubing, 358.22; Flexible Metallic Tubing, 360.22; Electrical Nonmetallic Tubing, 362.22; Cellular Concrete Floor Raceways, 372.11; Cellular Metal Floor Raceways, 374.5; Metal Wireways, 376.22; Nonmetallic Wireways, 378.22; Surface Metal Raceways, 386.22; Surfaced Metallic Raceways, 388.22; Underfloor Raceways, 390.5; Fixture Wire, 402.7; Teaters, 520.6; Signs, 600.31(C); Elevators, 620.33; Audio Signal Processing, Amplification, and Reproduction Equipment, 640.23(A) and 640.24; Class 1, Class 2, and Class 3 Circuits, Article 725; Fire Alarm Circuits, Article 760; and Optical Fiber Cables and Raceways, Article 770.

Substantiation: In accordance with CMP-8’s actions on Proposals 8-53 and 8-78, Article 352 will now apply to Rigid Polyvinyl Chloride Conduit: Type PVC” and Article 355 will apply to “Reinforced Thermosetting Resin Conduit: Type RTRC.” As noted in CMP-3’s statement on the original proposal, Article 353 already applies to HDPE conduit. Therefore, it is necessary to revise the reference in the text to reflect the change. This will correlate with the TCC Action on Proposal 3-83.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 3-63.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-66 Log #2090 NEC-P03  
Final Action: Rejected  
(300.18(C) (New))

Submitter: Leonard F. Devine, Jr., Palm Beach County Plan Review

Comment on Proposal No: 3-84

Recommendation: Add new text to read as follows: 300.18(C) Raceway Diameter. Raceways shall be of the same trade size from end to end of a run unless the trade size of the raceway is changed at an exposed junction/pull box, or the size of the raceway is changed in the run where visible.

Substantiation: This will help negate changes being made in a run where not visible and not being discovered during a remodel when one has assumed that the raceway is of the same trade size from one end to the other. Wiring sometimes is damaged when a contractor pulls wire into a smaller raceway.

Panel Meeting Action: Reject

Panel Statement: Section 300.18 applies generally to all wiring methods in Chapter 3. To make the proposed change apply generally would involve some rewiring with the changes made by this proposal as under-floor raceways in Article 390, cellular metal floor raceways in Article 374, cellular concrete floor raceways in Article 372, or other possible raceways, where the raceways and the junction boxes are under the concrete and technically would be in violation of the proposed text. In addition, the connecting raceways between the underground junction boxes are not a trade size. Trade sizes can be changed at conduit bodies, seal-off devices, and other applications also not covered by the proposed text.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-67 Log #1939 NEC-P03  
Final Action: Accept in Principle  
(300.19)

Submitter: Barry F. O’Connell, Tyco Thermal Controls

Comment on Proposal No: 3-85

Recommendation: Although covered in a general way in Section 110.3(B), I believe this proposal should be accepted because it clarifies specific requirements that apply only to Electrical Circuit Protective Systems that can fail from self-weight in a fire unless properly supported.

Substantiation: None given.

Panel Meeting Action: Accept in Principle

Panel Statement: Add a new 300.19(B) to read: (B) Fire Rated Cables and Conductors. Support methods and spacing intervals for fire rated cables and conductors shall comply with any restrictions provided in the listing of the electrical circuit protective system used and in no case shall exceed the values in Table 300.19(A).

Reidentify existing subdivision (B) as (C).

Panel Statement: New text is provided to specify the correct installation method for the fire rating of critical circuits.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-68 Log #1374 NEC-P03  
Final Action: Reject  
(300.22)

Submitter: William Wagner, Certification Solutions

Comment on Proposal No: 3-92

Recommendation: This Proposal should be revised and accepted as follows: 300.22 Wiring in Ducts, Pneums, and Other Air-Handling Spaces. The provisions of this section apply to the installation and uses of electric wiring and equipment in ducts, plenums, or other air-handling spaces, raceways, and other air-handling spaces. FPN: See Article 424, Part VI, for duct heaters.

(A) Ducts for Dust, Loose Stock, or Vapor Removal. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors. No wiring system of any type shall be installed in any duct, or shaft containing only such ducts, used for vapor removal or for ventilation of commercial-type cooking equipment.

(B) Ducts or Pneums Used for Environmental Air. Only wiring methods consisting of Type MI cable, Type MC cable employing a smooth or corrugated impermeable metal sheath without an overall nonmetallic covering, electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, or phenolic Type RTRC rigid nonmetallic conduit listed as having adequate fire-resistant and low smoke-producing characteristics, shall be installed in ducts or plenums specifically fabricated to transport environmental air. Flexible metal conduit shall be permitted, in lengths not to exceed 1.2 m (4 ft), to connect physically adjustable equipment and devices permitted to be in these ducts and plenum chambers. The connectors used with flexible metal conduit shall effectively close any openings in the connection. Equipment and devices shall be permitted within such ducts or plenums only to the extent of a person’s direct action upon, or sensing of, the contained air. Where equipment or devices are installed and illumination is necessary to facilitate maintenance and repair, enclosed gasketed-type luminaires (fixtures) shall be permitted.

(C) Other Space Used for Environmental Air. This section applies to space used for environmental air-handling purposes other than ducts and plenums as specified in 300.22(A) and (B). It does not include habitable rooms or areas of buildings, the prime purpose of which is not air handling.

F PN: The space over a hung ceiling used for environmental air-handling purposes is an example of the type of other space to which this section applies.

Recommendation: This section shall not apply to the joint or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces.

(1) Wiring Methods. The wiring methods for such other space shall be limited to totally enclosed, nonventilated, insulated busway having no provisions for plug-in connections, Type MI cable, Type MC cable without an overall nonmetallic covering, Type AC cable, or other factory-assembled multiconductor control or power cables that are specifically listed for the use, or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath. Other types of cables and conductors shall be installed in metallic rigid conduit, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, phenolic Type RTRC rigid nonmetallic conduit listed as having adequate fire-resistant and low smoke-producing characteristics, flexible metal conduit, or, where accessible, surface metal raceway or metal wireway with metal covers or solid bottom metal cable tray with solid metal covers.

(2) Equipment. Electrical equipment with a metal enclosure, or with a nonmetallic enclosure listed for the use and having adequate fire-resistant and low smoke-producing characteristics, and associated equipment suitable for the ambient temperature shall be permitted to be installed in such other space unless prohibited elsewhere in this Code.

Exception: Integral fan systems shall be permitted where specifically identified for such use.

(D) Information Technology Equipment. Electric wiring in air-handling areas beneath raised floors for information technology equipment shall be permitted in accordance with Article 645.

Substantiation: This proposal was Rejected by CMP-3 based upon the NFPA Standards Council’s Decision 05-24 that the NEC Project is “to maintain status quo in the NEC until the Technical Committee on Air Conditioning has, through processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.” This was done to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues pertaining to plenum cables.” However, since that time, I have been made aware of the Standards Council’s clarification that states that if a proposal has technical merits and is not related to NFPA 90A Flammability of plenum wire and cables issues, then the NEC CMP needs to act on them. This is the case for my proposal to revisit 300.22 of the NEC to permit the use of a limited range of RTRC products as a general purpose wiring method in Ducts of Plenums Used for Environmental Air. Therefore, I request that CMP-3 reconsider their Final Action on this proposal in light of the following:

Clearly, the determination of what raceway products are suitable for use in these applications is under the jurisdiction of NEC CMP-3. This proposal relates neither to the use of plenum wire or cable, nor to any product that is intended for use related to air conditioning applications. To unnecessarily restrict the range of products that can demonstrate their ability to provide safe and dependable performance, not based upon any technical merits, would result in an unfair advantage for products which have been grandfathered into these applications.
Accordingly, I have developed the necessary technical substantiation to concisely demonstrate to CMP-3 the ability of these products to be safely used in these applications. Based on this substantiation, phenolic RTRC products warranted inclusion in 300.22.

The position of Underwriters Laboratories in relation to flame spread and smoke developed values for materials used in plenums was put forth in UL’s Mr. Randy Laymon’s letter dated December 15, 2004.

As a result of my initial proposal, and this UL position paper, FRE Composites (2005) Inc. undertook testing with Underwriters Laboratories of phenolic RTRC products to both UL 2024 plenum and riser tests, and the ASTM E84 flame spread and smoke developed tests. As can be seen from the UL test data and reports, phenolic RTRC products, in a variety of trade sizes, were able to meet each of these testing programs with flame and smoke ratings significantly below the criteria established for products to be used in both plenum and riser applications.

The performance of these products, as demonstrated, is summarized as follows:

<table>
<thead>
<tr>
<th>Test</th>
<th>Maximum Permitted Value</th>
<th>Maximum Test Value</th>
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<tbody>
<tr>
<td>Plenum (UL 2024) Flame</td>
<td>5.00 ft</td>
<td>2.0 ft</td>
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<tr>
<td>Plenum (UL 2024) Smoke Peak</td>
<td>0.50</td>
<td>0.10</td>
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<td>Plenum (UL 2024) Smoke Avg.</td>
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<td>0.02</td>
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<td>Riser (UL 2024) Flame</td>
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<td>Riser (UL 2024) Temperature</td>
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<td>371 °F</td>
</tr>
<tr>
<td>ASTM E84 Flame Spread Index (FSI)</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>ASTM E84 Smoke Developed Index (SDI)</td>
<td>50</td>
<td>0</td>
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Therefore, in consideration of the data generated by an independent, NRTL accredited test laboratory, and in conjunction with UL’s stated position on this issue, these conduit products have conclusively demonstrated their ability to perform acceptably in both plenum and riser applications and I recommend their inclusion in 300.22 in accordance with revised Proposal 3-92. It should be noted that this proposal has been slightly modified from its original version in order to delete the FPN indicating suggested acceptance criteria for these products. The development of appropriate flame and smoke criteria, along with the product’s listing requirements is best left to the determination of the listing organization.

Additionally, a reference to “phenolic” RTRC conduit has been added in order to limit this proposal to only that conduit type which was evaluated as part of the technical substantiation provided with this comment.

Note: Supporting material is available for review at NFPA Headquarters.

| Panel Meeting Action: Reject | Panel Statement: This continues to be a proposal to be rejected based on Standards Council Decision 05-24 (SC05-7-4). This decision relates to combustibles in plenums and would include cables in conduit as well as “plenum cables.”
|                             | “1. Jurisdiction over combustibles in plenums. As the Council has indicated earlier in this decision, the Technical Committee on Air Conditioning, rather than the NEC Project, has, for many years, and should continue to have, primary jurisdiction for air distribution systems including the subject of combustibles, such as cables, in ducts, plenums and other air handling spaces (plenum spaces).” |
| Number Eligible to Vote: 13 | Ballot Results: Affirmative: 13 |

3-70 Log #828 NEC-P03

<table>
<thead>
<tr>
<th>Final Action: Reject</th>
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<tr>
<td>300.22(C) Exception</td>
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| Submitter: Neal Dorenkott, City of Eastlake / Rep. BOCONEO |
| Comment on Proposal No: 7-54 |
| Recommendation: Delete the following text: |
| Exception: This section shall not apply to the joint or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces. |
| Substantiation: Referring to Proposal 7-54 Log #553, the Panel Statement states: “Section 300.22 addresses wiring in ducts, plenums, and other air-handling spaces and, therefore, applies to all wiring methods. The reference in 334 is not needed.” If the panel states it is unnecessary to repeat the requirement in 334.10, then they are agreeing with the issue that NM, NMC and NMS should not be allowed in air returns. Therefore the exception of 300.22(C) is not justified. The panel is allowing contradiction by allowing this exception. I encourage the panel to reconsider my proposal and/or delete the exception of 300.22(C), as it is allowing confusion in the interpretation of the code. |
| Panel Meeting Action: Reject |
| Panel Statement: The exception in 300.22(C) has been in the NEC for many years and applies where a joist or stud space is used in a dwelling unit as other spaces for environmental air. This exception permits wiring to pass through this space perpendicular to the long dimension of the space. Panel 7 simply stated that it was not necessary to repeat the requirement in 334.10. |
| Number Eligible to Vote: 13 |
| Ballot Results: Affirmative: 13 |

3-71 Log #829 NEC-P03

<table>
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<th>Final Action: Reject</th>
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<tr>
<td>300.22(C) Exception</td>
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</table>

| Submitter: Neal Dorenkott, City of Eastlake / Rep. BOCONEO |
| Comment on Proposal No: 7-47 |
| Recommendation: Delete the following text: |
| Exception: This section shall not apply to the joint or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces. |
| Substantiation: Referring to Proposal 7-47 Log #552, the Panel Statement states: “The exception to 300.22(C) applies in general and it is unnecessary to repeat the requirement in 334.10.” If the panel states it is unnecessary to repeat the requirement in 334.10, then they are agreeing with the issue that NM, NMC and NMS should not be allowed in air returns. Therefore the exception of 300.22(C) is not justified. The panel is allowing contradiction by allowing this exception. I encourage the panel to reconsider my proposal and/or delete the exception of 300.22(C), as it is allowing confusion in the interpretation of the code. |
| Panel Meeting Action: Reject |
| Panel Statement: See the panel action and statement on Comment 3-70. |
| Number Eligible to Vote: 13 |
| Ballot Results: Affirmative: 13 |

3-72 Log #1439 NEC-P03

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<th>Final Action: Reject</th>
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<td>300.24</td>
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| Submitter: James O’Driscoll, IBEW Local #98 |
| Comment on Proposal No: 3-100 |
| Recommendation: I agree with P. Casparro’s Explanation of Negative. |
| Substantiation: Cables of all energy levels should be kept off ceiling tiles. These cables laying on the ceiling grid and tiles inhibit the servicing and maintenance of all building systems. |
| Panel Meeting Action: Reject |
| Panel Statement: There has been no additional technical substantiation added by this comment to counter the panel statement in the proposal. The panel reaffirms its position as stated in its statement on Proposal 3-100. Additionally, Section 300.23 already covers panels designed to allow access. |
| Number Eligible to Vote: 13 |
| Ballot Results: Affirmative: 13 |
Panel Meeting Action: Rejected

Ballot Results: Affirmative: 13

3-74 Log #1067 NEC-P03
Number Eligible to Vote: 13
Panel Meeting Action: Accept in Principle
Ballot Results: Affirmative: 13

3-77 Log #1914 NEC-P03
Number Eligible to Vote: 13
Panel Meeting Action: Reject
Ballot Results: Affirmative: 13

3-78 Log #1375 NEC-P03
Panel Meeting Action: Accept in Principle
Ballot Results: Affirmative: 13

Submitter: Larry Cross, IBEW Local 98
Comment on Proposal No: 3-100
Recommendation: I agree with P. Casparro.
Substantiation: We continue to support keeping wires and cable of any energy level off of ceiling tiles
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-72.

3-76 Log #1068 NEC-P03
Number Eligible to Vote: 13
Panel Meeting Action: Reject
Ballot Results: Affirmative: 13

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 3-103
Recommendation: Revise text to read as follows: "...physical damage of the sort that tends to be readily visible..."
Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC’s explicit definitions. The NEC Style Manual saying in “3.2.5.5 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology” this does not benefit the ordinary user. The Style Manual is offering an option, not a requirement. I assumed the term was being used loosely to mean damage from blows, abrasion, pressure, or tension, but assumptions should not be necessary. An ideal I believe we share is to enforce the Code as written, not “You know what we mean.” This CMP’s statement indicates that they intended the long-term physical effects of chemicals and radiation, such as embrittlement, to be among types of damage excluded. Other CMPs use the term with somewhat different intentions, if one reads the Panel Statements in this ROP. Webster’s definition does not clue us to this, nor does Article 100, nor does the beginning of this chapter. I would hope 110.3(A)(2)’s requirement of suitable “mechanical strength and durability” sufficed. If this additional statement is needed because that is too broad, let’s say exactly what the CMP statement indicates is meant.
Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-34.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-75 Log #1200 NEC-P03
Number Eligible to Vote: 13
Panel Meeting Action: Accept
Ballot Results: Affirmative: 13

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 3-5
Recommendation: The NEC TCC Grounding and Bonding Task Group recommends that CMP-3 that for 300.40 the original proposed wording was not entirely correct in this case. However, the Task Group remains concerned that “connected to ground” does not adequately describe where the connection is to be made. Therefore, the Task Group has proposed new wording that more clearly identifies where the connection of the shielding can be made. This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Dalcep Mohla; Phil Simmons; Christopher Hutchings; John Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr. The following is the minority affirmative comment by one Task Group member during the Task Group’s results balloting: “The term “grounding conductor” should be “grounding electrode conductor.” The present definition for “grounding conductor” is vague and very similar to the definition of “grounding electrode conductor.””
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 3-106
Recommendation: The Proposal should be Accepted as originally proposed.
Substantiation: This Proposal should be Accepted as originally proposed. 300.50(B) Protection from Damage. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, rigid PVC Schedule 80 rigid PVC conduit, or equivalent, extending from the minimum cover depth specified in Table 300.50 to a point 2.5 m (8 ft) above finished grade.
Substantiation: In accordance with CMP-8’s actions on Proposals 8-53, Article 352 will now apply to “Rigid Polyvinyl Chloride Conduit: Type PVC”. Therefore, it is necessary to revise the terminology used throughout the remainder of the NEC for consistency. As the only type of rigid nonmetallic conduit that is currently listed in Schedule 80 dimensions is rigid PVC conduit, the reference in 300.50(B) should be revised as noted above.
Panel Meeting Action: Accept in Principle
Revise 300.50(B) to read:
(B) Protection from Damage. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, Schedule 80 PVC conduit, or equivalent, extending from the minimum cover depth specified in Table 300.50 to a point 2.5 m (8 ft) above finished grade.
Panel Statement: Based on the action of Panel 8 on Proposal 8-53, it appears that revised Article 352 uses the acronym PVC, not rigid PVC, so the text was revised using PVC.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: William Wagner, Certification Solutions
Comment on Proposal No: 3-106
Recommendation: This Proposal should be Accepted as originally proposed.
Substantiation: This Proposal should be Accepted as originally proposed. 300.50(B) Protection from Damage. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, Schedule 80 rigid PVC conduit, or equivalent, extending from the minimum cover depth specified in Table 300.50 to a point 2.5 m (8 ft) above finished grade.
Substantiation: In accordance with CMP-8’s actions on Proposals 8-53, Article 352 will now apply to “Rigid Polyvinyl Chloride Conduit: Type PVC”. Therefore, it is necessary to revise the terminology used throughout the remainder of the NEC for consistency. As the only type of rigid nonmetallic conduit that is currently listed in Schedule 80 dimensions is rigid PVC conduit, the reference in 300.50(B) should be revised as noted above.
Panel Meeting Action: Accept in Principle
Revise 300.50(B) to read:
(B) Protection from Damage. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, Schedule 80 PVC conduit, or equivalent, extending from the minimum cover depth specified in Table 300.50 to a point 2.5 m (8 ft) above finished grade.
Panel Statement: Based on the action of Panel 8 on Proposal 8-53, it appears that revised Article 352 uses the acronym PVC, not rigid PVC, so the text was revised using PVC.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
3-79 Log #1069 NEC-P03 Final Action: Reject
(300.50(D))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 3-107
Recommendation: Revise text to read as follows:

“...physical damage of the sort that tends to be readily visible...”

Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC’s explicit definitions. The NEC Style Manual saying in “3.2.5.5 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology” this does not benefit the ordinary user. The Style Manual is offering an option, not a requirement. I assumed the term was being used loosely to mean damage from blows, abrasion, pressure, or tension, but assumptions should not be necessary. An ideal I believe we share is to enforce the Code as written, not “You know what we mean.” This CMP’s statement indicates that they intended the long-term physical effects of chemicals and radiation, such as embrittlement, to be among types of damage excluded. Other CMPs use the term with somewhat different intentions, if one reads the Panel Statements in this ROP. Webster’s definition does not clue us to this, nor does Article 100, nor does the beginning of this chapter. I would hope 110.3(A)(2)’s requirement of suitable “mechanical strength and durability” sufficed. If this additional statement is needed because that is too broad, let’s say exactly what the CMP statement indicates is meant.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-34.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 310 — CONDUCTORS FOR GENERAL WIRING

6-1 Log #672 NEC-P06 Final Action: Accept
(310.4)

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 6-7
Recommendation: I agree with the Panel Action to add a new paragraph to 310.13 except the word “multi-conductor” should be changed to “multiconductor”.

Substantiation: This is an editorial correction for consistency. Multiconductor is not hyphenated. In the 2005 NEC, the word “multi-conductor” is only used in Articles 690 and 810 and Annex D. The word “multiconductor” is used in 31 Articles, Chapter 9, and Annex B. In the 2008 preprint, “multi-conductor” only appears 7 times whereas “multiconductor” appears 142 times.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-2 Log #673 NEC-P06 Final Action: Accept in Principle in Part
(310.4)

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 6-7a
Recommendation: The Proposal should be Accepted in Principle. Revise the second sentence in the first paragraph to read:

“Where parallel equipment grounding conductors are used with conductors in parallel, they shall be sized in accordance with 250.122.”

Combine Exceptions No. 1 and No. 2 by moving the phrase “for frequencies of 360 Hz and higher” from Exception No. 2 into Exception No. 1 so Exception No. 1 will read as shown below (underlining added for Comment review only and is not to be included in the final text):

Exception No. 1: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contacts, relays, solenoids, and similar control devices, or for frequencies of 360 Hz and higher, provided all of the following apply:

(a) They are contained within the same raceway or cable.
(b) The ampacity of each individual conductor is sufficient to carry the entire load current shared by the parallel conductors.
(c) The overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.

Delete Exception No. 2.

Renumber Exception No. 3 as Exception No. 2 and in the FPN, change Exception No. 3 to Exception No. 2.

Delete Exception No. 4.

In the FPN, at the end of the section, change “multi-conductor” to “multiconductor”, delete the word “listed”, and reword to read:

“See 110.13 for sectioned equipment grounding conductors in multiconductor cables.”

Substantiation: The deletion of the words “with conductors in parallel” from the existing 2005 NEC changes the requirements without substantiation and would permit the use of parallel equipment grounding conductors when the phase, neutral, or grounded circuit conductors are not paralleled.

Since Exceptions No. 1 and No. 2 have identical requirements, the two Exceptions can be combined into Exception No. 1, Exception No. 2 can be deleted, and Exception No. 3 renumbered as Exception No. 2.

Exception No. 4 is not required since 90.3 states “Chapters 1, 2, 3, and 4 apply generally; Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, and 7 for the particular conditions.” 620.12(A)(1) modifies the general rule in 310.4 for traveling cables.

The substantiation for the modifications to the FPN at the end of the section is as follows:

(1) The change to “multiconductor” is an editorial correction for consistency. Multiconductor is not hyphenated. In the 2005 NEC, the word “multi-conductor” is only used in Articles 690 and 810 and Annex D. The word “multiconductor” is used in 31 Articles, Chapter 9, and Annex B. In the 2008 preprint, “multi-conductor” only appears 7 times whereas “multiconductor” appears 142 times.

(2) Deletion of the word “listed” is necessary since “listing” is not a requirement in most of the multiconductor cable Articles.

3-79 Log #1069 NEC-P06 Final Action: Accept in Principle in Part
(310.4)

TCC Action: The Technical Correlating Committee understands that the FPN immediately following 310.4(E) of the text recommended in Comment 6-3 is deleted and incorporated as a new second sentence in 310.4(E).

The Technical Correlating Committee further understands that the word “listed” is deleted from this new second sentence by the panel action on Comment 6-2.

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 6-7a
Recommendation: Revise 310.4 of the ROP text to read as follows:

310.4 Conductors in Parallel.

(A) General. Aluminum, copper-clad aluminum, or copper conductors of size 1/0 AWG and larger, comprising each phase, polarity, neutral, or grounded circuit conductors, or equipment grounding conductors shall be permitted to be connected in parallel (electrically joined at both ends). Where parallel equipment grounding conductors are used they shall be sized in accordance with 250.122.

Exception No. 1: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contacts, relays, solenoids, and similar control devices, provided all of the following apply:

(a) They are contained within the same raceway or cable.
(b) The ampacity of each individual conductor is sufficient to carry the entire load current shared by the parallel conductors.
(c) The overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.

Exception No. 2: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contacts, relays, solenoids, and similar control devices, provided all of the following apply:

(a) They are contained within the same raceway or cable.
(b) The ampacity of each individual conductor is sufficient to carry the entire load current shared by the parallel conductors.
(c) The overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.

Exception No. 3: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contacts, relays, solenoids, and similar control devices, provided all of the following apply:

(c) The overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.

Exception No. 4: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contacts, relays, solenoids, and similar control devices, provided all of the following apply:

(c) The overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.

(B) Conductor Characteristics. The paralleled conductors in each phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor shall comply with all of the following:


(1) Be the same length
(2) Have the same conductor material
(3) Be the same size in circular mil area
(4) Have the same insulation type
(5) Be terminated in the same manner
(C) Separate Cables or Raceways. Where run in separate cables or raceways, the cables or raceways with conductors shall have the same number of conductors, and shall have the same electrical characteristics. Conductors of one phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor shall not be required to have the same physical characteristics as those of another phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor to achieve balance.
(D) Ampacity Adjustment. Conductors installed in parallel shall comply with the provisions of 310.15(B)(2)(a).
(E) Equipment Grounding Conductors. Where parallel equipment grounding conductors are installed they shall be sized in accordance with 250.122. FNPN: For sectioned equipment grounding conductors in listed multicore cables, see 310.13
Exception No. 1: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contactors, relays, solenoids, and similar control devices, provided all of the following apply:
(a) They are contained within the same raceway or cable.
(b) The ampacity of each individual conductor is sufficient to carry the entire load current shared by the parallel conductors.
(c) The overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.
Exception No. 2: Conductors, other than equipment grounding conductors, in sizes smaller than 1/0 AWG shall be permitted to be run in parallel for frequencies of 360 Hz and higher where conditions (a), (b), and (c) of Exception No. 1 are met.
Exception No. 3: Under engineering supervision, grounded neutral conductors in sizes 2 AWG and larger shall be permitted to be run in parallel for existing installations.
FPN: Section 310.4 Exception No. 3 can be used to alleviate overheating of neutral conductors in existing installations due to high content of triplen harmonic currents.
Exception No. 4: As permitted in 620.12(A)(1).
The paralleled conductors in each phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor shall comply with all of the following:
(a) Be the same length
(b) Have the same conductor material
(3) Be the same size in circular mil area
(4) Have the same insulation type
(5) Be terminated in the same manner
Where paralleled equipment grounding conductors, the cables or raceways with conductors shall have the same number of conductors, and shall have the same electrical characteristics. Conductors of one phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor shall not be required to have the same physical characteristics as those of another phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor to achieve balance.
Conductors installed in parallel shall comply with the provisions of 310.15(B)(2)(a).
FPN: For sectioned equipment grounding conductors in listed multicore cables, see 310.13
Substantiation: The panel was correct to begin a reorganization of 310.4 in Proposal 6-7a. This comment is to further enhance that rewrite by reorganizing the material into subsections with headings. This arrangement will also allow the exceptions to follow the appropriate part of the text they are taking exception to. The following is the specific substantiation for the revisions and arrangement:
1) The first paragraph is titled "general" since it contains the basic permission to allow parallel connections.
2) The words “equipment grounding conductor” have been deleted from this main paragraph. When the panel added equipment grounding conductors to the list of involved conductors, it created a direct conflict with the last sentence relative to the permitted sizing. Equipment grounding conductors have not been subjected to the 1/0 and larger provisions, but the revision in the ROP implies that they are subject to that limitation. The sentence dealing with equipment grounding conductor sizing has been given its own subsection and heading.
3) Exceptions 1, 2 and 3 have been relocated to follow this “general” paragraph. All three exceptions are taking exception to the 1/0 sizing provisions in some manner or another. This arrangement makes the exceptions more logical in their approach.
4) In exceptions 1 and 2, the words “other than equipment grounding conductors” have been deleted from the first sentence. These words are no longer needed since equipment grounding conductors are dealt with separately in paragraph (E). The main paragraph specifies the involved conductors and the exceptions would be limited to those conductors (unless further limited by the exception itself).
5) The existing text about the conductor characteristics is still in tact, but is now placed under its own subsection as item (B).
6) The existing paragraph about separate raceways or cables is still intact, but broken out into its own subsection (C).
7) The existing sentence about applying the ampacity adjustment factors is still in tact but given its own subsection (D).
8) The equipment grounding conductor sizing provisions has been moved to its own subsection (E). This also allows for placement of the FPN on sectioned conductors to be located directly below this paragraph.
9) The existing Exception #4 is deleted. Since the rule in 620 takes specific exception to the text in 310, and exception is not needed. In fact, the inclusion of the exception adds confusion because it implies that any item modified by Chapters 5, 6, or 7 needs an exception in the general chapters. The deletion of the exception is consistent with the TCC direction to avoid redundancy with the provisions of 90.3.
The requirements for 310.4 are not changed by this comment, but the material is provided in a much more user friendly manner and will make the rules easier to find and cite when needed.
Panel Meeting Action: Accept in Principle in Part
Delete the FPN immediately following (E) and add a second sentence to (E) to read: “Sectioned equipment grounding conductors smaller than 1/0 AWG shall be permitted in multicore cables in accordance with 310.13, provided the combined circular mil area in each cable complies with 250.122.”
The panel accepts the remainder of the Comment.
Panel Statement: This action also addresses Comment 6-41 and locates the information in the FPN as positive text as recommended in the NEC Style Manual.
The panel action on Comment 6-02 modifies the action on this comment.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
(E) Amperage adjustment. Conductors installed in parallel shall comply with the provisions of 310.15(B)(2)(a).

FPN: For sectioned equipment grounding conductors in listed multicore cables see 310.11.

Substantiation: The existing text of the accepted proposal does not allow for equipment grounding conductors smaller than 1/0 AWG. In addition to this, a list format and subsections makes for a more user-friendly document.

Panel Meeting Action: Accept in Principle

See the panel action on Comments 6-2 and 6-3.

Panel Statement: See the panel action and statement on Comments 6-2 and 6-3.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-5 Log #2258 NEC-P06 Final Action: Reject

6-10 Log #365 NEC-P06 Final Action: Reject

6-6 Log #572 NEC-P06 Final Action: Reject

6-7 Log #572 NEC-P06 Final Action: Reject

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Submitter: Donald A. Ganiere, Ottawa, IL

Comment on Proposal No: 6-8

Recommendation: This proposal should be accepted.

Substantiation: The panel rejected this proposal with the comment that the current wording complies with section 3.1.3 of the NEC Style Manual. Based on the online version of this document, I think the panel meant to say section 3.1.2. This section says that the use of the words “shall be permitted” are to be used to “indicate allowed optional or alternate methods.” That would indicate that there must be some rule that says that conductors cannot be installed in parallel. I am not aware of any such rule. Using the current wording “shall be permitted” in no way limits the use of smaller conductors installed in parallel. The rule should be changed to the wording in the proposal to provide a valid restriction on the use of conductors smaller than 1/0 in parallel.

Panel Meeting Action: Reject

Panel Statement: The submitter is correct that the NEC Style Manual reference in the panel statement on Proposal 6-8 should have been 3.1.2, Permissive Rules. The parenthetical sentence immediately following the referenced text states, “(Note that these are still mandatory language and constitute rules.)” Also, Item 4 under 3.3.1, Writing Style General Guidelines, in the NEC Style Manual states, “Use positive language, rather than negative, wherever possible.” Section 250.118 defines the types of equipment grounding conductors and uses the singular of “conductor” except in 250.118(10). Section 310.4 deals with conductors that are run in parallel. The language specifically allows conductors 1/0 or larger to be run in parallel, which means conductors smaller than 1/0 in general are not permitted to be run in parallel.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

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Submitter: James (Jim) Erwin, Celanese Ltd

Comment on Proposal No: 6-13


Substantiation: Insufficient evidence exists to stop the use of UL listed and manufacturer approved non-shielded cable that is properly installed and properly terminated for 5 kV applications. The introduction of shielded cables with stress cone termination in confined spaces may introduce new safety concerns.

Panel Meeting Action: Reject

Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative: HUDDLESTON, JR., R.: The panel again chose to ignore the many years of solid evidence supporting the fact that with proper installation, non shielded cable may be used safely for 4160 volt applications. The Panel Statement sums it up: “The potential hazard that arises by using non shielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.” By making this statement, the Panel has effectively said that it does not matter whether the cable is installed in conduit or is metal-clad and installed by qualified persons - they believe it is unsafe regardless. What a wasted step in the right direction for theirs and others safety.

ZIMNOCH, J.: The original purpose for applying shields to medium voltage cables, discovered in the late 1800’s, was to “connect the sufficient number of points on the insulation surface for the purpose of equalizing the potential differences.” Thus, the shield provides a zero-potential on the external surface of the insulation. In the case of a non-shielded cable operating at voltages above 2.4 kV, the greater the air gap from the insulation surface to ground, the greater the potential on the surface of the cable which creates a substantial safety and reliability concern.

IEC has always recommended the use of a shield for voltages rated above 2kV for the reasons above. It was the introduction of the “Exception” in the 1975 code that permitted use of non-shielded cable to voltages as high as 8 kV. In 1975 the scientific laws had not changed, only the rules guiding its use had. To date, regardless of the type of insulation or thickness used, both to cable and terminations will retain a standing voltage and discharge when operated above 2.4 kV. The use of metallic conduit, sheaths or track resistant tubing’s over the ends will not stop this. I have spoken to many trained medium voltage splicers/electricians that agreed that limiting the use of non-shielded cable to 2.4 kV operation was a step in the right direction for theirs and others safety.

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Submitter: William M. Lewis, Martinsville, IN

Comment on Proposal No: 6-13

Recommendation: The proposal should have been Accepted and expanded to include the installation of non-shielded 4160 volt cable in metal conduit.

Substantiation: All of the negative comments are correct. Also, the proposal addresses the perceived safety issues in the positive comments. Regarding Mr. Laider’s comment: Shielded cable is not shielded at the termination. My experience is that shielded cable experiences higher failure rates at the terminations than nonshielded at 4160 volts.

Regarding Mr. Zimnoch’s comments: The proposed metallic enclosure, while not addressing the technical issue of insulation degradation, would have the same result as individual shielding as regards safety.
Two points regarding the panel statement:
1. the panel made the change in the 2005 code without technical substantiation.
2. the extensive testing and listing by UL provides adequate technical substantiation.

I am submitting a comment only on this one proposal to reduce the panel’s workload, even though all the proposals from 6-14 through 6-25 need reconsideration.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations. The panel disagrees with the statement that technical substantiation was lacking in the previous code cycle.


Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6. ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

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6-8 Log #674 NEC-P06 Final Action: Accept (310.6)

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 6-16

Recommendation: I support the Panel Action to Reject the Proposal.

Substantiation: UL is developing UL Standard 2460 that will address the submittor’s request for use of nonshielded conductors up to 5000 volts when part of an assembly. The Scope of the proposed standard is shown below for information.

1 Scope:
1.1 These requirements cover single-conductor, nonshielded cables rated 5000 volts, 90°C dry only.
1.2 The cables covered by these requirements are intended solely for use as factory-installed wiring in equipment (internal wiring).
1.3 These requirements do not cover cables that are intended for direct installation in buildings or structures in accordance with the National Electrical Code (NEC), NFPA 70.
1.4 The final acceptance of these cables is dependent upon their use in complete equipment that conforms with the standards applicable to such equipment.

Panel Meeting Action: Accept

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6.

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6-9 Log #1235 NEC-P06 Final Action: Accept in Principle (310.6)

TCC Action: The Technical Correlating Committee directs that the panel action on this comment be reported as “Accept in Principle” according to the panel action on Comment 5-6 on Proposal 5-18 and the term “grounding conductor” is changed to “grounding electrode conductor”.

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 6-4

Recommendation: Revise 310.6 as follows:
Solid metallic conductors operated above 2000 volts in permanent installations shall have ozone-resistant insulation and shall be shielded. All metallic insulation shields shall be connected to a grounding conductor, grounding busbar, or a grounding electrode be grounded through an effective grounding path meeting the requirements of 250.14(A)(5) or 250.14(B)(4). Shielding shall be for the purpose of confining the voltage stresses to the insulation.

Substantiation: The revised wording proposed in this comment attempts to address the concerns expressed by the Panel in their rejection of this part. The existing language is vague and does not describe how the grounding of the cable shield is to be done. The Bonding and Grounding Task Group concluded that it is necessary to replace vague references to “shall be grounded” with more prescriptive requirements. If the proposed wording does not meet the intent of this section, the Task Group encourages the Panel to develop alternative wording that provides a prescriptive requirement.

Note: The term “grounding conductor” will have to be replaced with “grounding electrode conductor” if Proposal 5-18 continues to be accepted. This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Dalep Mohla; Paul Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr. The following is the minority affirmative comment by one Task Group member during the Task Group’s results balloting:

The term “grounding conductor” should be “grounding electrode conductor”. The present definition for “grounding conductor” is vague and very similar to the definition of “grounding electrode conductor.”

Panel Meeting Action: Accept
Panel Statement: If Proposal 5-18 continues to be accepted, this comment is accepted in principle and “grounding conductor” is changed to “grounding electrode conductor.”

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

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6-10 Log #1891 NEC-P06 Final Action: Reject (310.6)

Submitter: Paul S. Hamer, Chevron Energy Technology Company

Comment on Proposal No: 6-13

Recommendation: Proposal 6-13, as modified in Mr. McClung’s Explanation of Negative, should be accepted.

Substantiation: When conductors are enclosed in an overall metallic sheath or armor that is grounded, there is no shock hazard since the conductor’s electric field is confined to within the metallic sheath or armor. In fact, the same is true for unshielded cables installed in metallic conduit. The Panel Statement for rejection of this Proposal is incorrect.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

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6-11 Log #1892 NEC-P06 Final Action: Reject (310.6)

Submitter: Paul S. Hamer, Chevron Energy Technology Company

Comment on Proposal No: 6-17

Recommendation: Proposal 6-17 should be accepted.

Substantiation: When conductors are enclosed in an overall metallic sheath, armor, or conduit, there is no shock hazard since the conductor’s electric field is confined to within the metallic sheath, armor, or conduit. Also, see the Explanation of Negative comments for this Proposal. The Panel Statement for rejection of this Proposal (by referring back to the 2005 Code cycle) does not respect the NFPA Regulations Governing Committee Projects 4-3.5.1, which states “...Such statement shall be sufficiently detailed so as to convey the TC’s rationale for its action so that rebuttal may, if desired, be submitted during the Comment period.” The Panel must provide reasonable rationale if the Panel Action on the original Proposal is other than “accept.” It has not fulfilled this obligation in the ROP.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

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6-12 Log #1155 NEC-P06 Final Action: Reject (310.6 Exemption)


Comment on Proposal No: 6-14

Recommendation: Proposal 6-14 should be accepted-in-principle.
Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
HUNDELESTON, JR., R.: See My Explanation of Negative on Comment 6-6.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-6.
WALL, C.: See my statement on Comment 6-12.

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
HUNDELESTON, JR., R.: See My Explanation of Negative on Comment 6-6.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-6.
WALL, C.: See my statement on Comment 6-12.

Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations and in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Recommendation: Proposal 6-16 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.
Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications during the 2005 cycle, especially when installed as armored cable as this proposal specified. Code Panel members should seriously consider the effects on those in industry who are faced with situations where they have existing medium voltage installations where terminations are not stress-coned and non-shielded cable has been used successfully. If changes or modifications to these installations must be made, older existing equipment will not generally allow enough space to terminate shielded cable.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6. ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

6-17 Log #1815 NEC-P06 Final Action: Reject (310.6 Exception)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 6-14
Recommendation: Proposal 6-14 should have been accepted as submitted.
Change Exception 1 to read “Nonshielded insulated conductors listed by a qualified testing laboratory shall be permitted for use up to 5000 volts under the following conditions…”

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications. There are literally hundreds of documented examples of safe nonshielded cable installations that have been in place for many years, with no problems whatsoever. The panel, in rejecting this proposal, refused to acknowledge the hardships that banning nonshielded cable for 4160 volt applications imposes on users of existing equipment, such as retrofitting larger junction boxes on motors and switchgear in order to allow adequate room to install stress cones (and voiding UL listing by modifying the equipment).

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6. ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

6-18 Log #1816 NEC-P06 Final Action: Reject (310.6 Exception)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 6-15
Recommendation: Proposal 6-15 should have been accepted as submitted.
Change 2400 volts to 5000 volts in Exception: “Nonshielded insulated conductors listed by a qualified testing laboratory shall be permitted for use up to 5000 volts under the following conditions…”

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications. There are literally hundreds of documented examples of safe nonshielded cable installations that have been in place for many years, with no problems whatsoever. The panel, in rejecting this proposal, refused to acknowledge the hardships that banning nonshielded cable for 4160 volt applications imposes on users of existing equipment, such as retrofitting larger junction boxes on motors and switchgear in order to allow adequate room to install stress cones (and voiding UL listing by modifying the equipment).

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6. ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

6-20 Log #1153 NEC-P06 Final Action: Reject (310.6 Exception No. 2 (New))


Comment on Proposal No: 6-13
Recommendation: Proposal 6-13 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6. ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

6-21 Log #1163 NEC-P06 Final Action: Reject (310.6 Exception No. 2 (New))


Comment on Proposal No: 6-18
Recommendation: Proposal 6-18 should be accepted-in-principle.
Substantiation: See companion EEI submitted comments on Proposals 6-15 and 6-19.
Refer to EEI's companion comment on Proposal 6-15.
The Edison Electric Institute supports efforts to bring this change about.

HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-6.

MCCLUNG, L.: See My Explanation of Negative on Comment 6-6.
WALL, C.: See my statement on Comment 6-12.

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6.
ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

Ballot Results: Affirmative: 8 Negative: 3

Proposal 6-19 should have been accepted in principle as amended during panel discussions - replacing 8000 volts (8 kV) by 5000 volts (5 kV) in the proposal text.

**Exception No. 2: In industrial establishments where the conditions or maintenance and supervision ensure that only qualified persons service the installation, nonshielded insulated conductors shall be permitted for use up to 5000 volts.**

Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications, especially when installed as armored cable as this proposal specified.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Proposal 6-19 should have been accepted as described below (FPN altered from original proposal).

Exception present Exception as Exception No. 1: and add Exception No. 2: 

"Nonshielded multicore cables rated 2001 - 5000 volts listed by a qualified testing laboratory shall be permitted for use up to 5000 volts if the cable has an overall metallic shield or armor. The metallic sheath or armor shall be grounded through an effective grounding path meeting the requirements of 250.4(A)(5) or 250.4(B)(4).

FPN: see 300.3(C)(2) for installation requirements for conductors rated over 600 volts."

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications, especially when installed as armored cable as this proposal specified.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Proposal 6-19 should have been accepted in principle as amended during panel discussions - replacing 8000 volts (8 kV) by 5000 volts (5 kV) in the proposal text.

Exception No. 2: In industrial establishments where the conditions or maintenance and supervision ensure that only qualified persons service the installation, nonshielded insulated conductors shall be permitted for use up to 5000 volts when installed in a metal raceway such as rigid metal conduit.

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications, especially when installed as armored cable as this proposal specified.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Proposal 6-19 should have been accepted in principle as amended during panel discussions - replacing 8000 volts (8 kV) by 5000 volts (5 kV) in the proposal text.

Exception No. 2: In industrial establishments where the conditions or maintenance and supervision ensure that only qualified persons service the installation, nonshielded insulated conductors shall be permitted for use up to 5000 volts when installed in a metal raceway such as rigid metal conduit.

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications, especially when installed as armored cable as this proposal specified.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Proposal 6-19 should have been accepted in principle as amended during panel discussions - replacing 8000 volts (8 kV) by 5000 volts (5 kV) in the proposal text.

Exception No. 2: In industrial establishments where the conditions or maintenance and supervision ensure that only qualified persons service the installation, nonshielded insulated conductors shall be permitted for use up to 5000 volts when installed in a metal raceway such as rigid metal conduit.

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications, especially when installed as armored cable as this proposal specified.

Panel Meeting Action: Reject
Panel Statement: The potential hazard that arises by using nonshielded cable above 2.4 kV exists in all locations in all conditions whether maintained by qualified or unqualified personnel. This includes conduit installations and metal-clad cable installations.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Proposal 6-19 should have been accepted in principle as amended during panel discussions - replacing 8000 volts (8 kV) by 5000 volts (5 kV) in the proposal text.

Exception No. 2: In industrial establishments where the conditions or maintenance and supervision ensure that only qualified persons service the installation, nonshielded insulated conductors shall be permitted for use up to 5000 volts when installed in a metal raceway such as rigid metal conduit.

Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications, especially when installed as armored cable as this proposal specified.
The Panel should Accept Proposal 6-23 and revise the Exception from 5000 volts. This is contrary to their panel statement for comment 6-12 where they stated that there were hazards that arose for such cables in all locations where nonshielded conductors were used. The hazard that the panel wants to eliminate is the danger associated with working on live terminations. This hazard is addressed by the work procedures dictated by NFPA 70E and OSHA, not the NEC. Requiring shielded cables does not make the installation safer. Also see my statement on Comment 6-12.

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6.

LAIDLER, W.: See my comment on affirmative vote on Comment 6-36.
ZIMNOCH, J.: See my affirmative statement on Comment 6-6.

6-29 Log #1167 NEC-P06 Final Action: Reject (310.7)


Comment on Proposal No: 6-22
Recommendation: Accept-in-principle Proposal 6-22 by changing the proposed text “rated 2001-5000 volts listed by a qualified testing laboratory” to “rated and listed for 2001-5000 volts” and moving FPN No. 1 as shown in the following revised text of 310.7.

310.7 Direct Burial Conductors. Conductors used for direct burial applications shall be of a type identified for such use.

FPN No. 1: See 300.5 for installation requirements for conductors rated 600 volts or less.

FPN No. 2: See 300.50 for installation requirements for conductors rated over 600 volts.

Substantiation: The Edison Electric Institute supports the Proposal Submitter’s substantiation and the negative ballot comment by Mr. McClung. In addition, nonshielded cables have been used safely for decades especially where 4.16kV and 4.8kV applications are more prevalent.

The suggested revised text in this comment addresses Code-Making Panel No. 6’s concern for meeting the NEC Style Manual regarding the use of the word “listed” and FPN No. 1 is technically associated with the first paragraph of 310.7.

Panel Meeting Action: Reject
Panel Statement: Limiting the voltage to 2.4 kV in the exception to 310.7 for nonshielded multiconductor cable was inadvertently overlooked during the 2005 Code cycle. The safety concerns of using nonshielded cable are the same for underground installations as for those aboveground.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative: HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-6.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-6.
WALL, C.: The panel is disregarding the fact that the cables allowed by the exception are listed for the application and do not create an unsafe installation. The hazard that the panel wants to eliminate is the danger associated with working on live terminations. This hazard is addressed by the work procedures dictated by NFPA 70E and OSHA, not the NEC. Requiring shielded cables does not make the installation safer. Also see my statement on Comment 6-12.

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6.

6-30 Log #1169 NEC-P06 Final Action: Reject (310.7)


Comment on Proposal No: 6-24
Recommendation: Reject this Proposal.

Substantiation: See companion EEI submitted comments on Proposals 6-15, 6-19, and 6-22.

6-27 Log #35 NEC-P06 Final Action: Accept (310.6 Exception No. 3 (New))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 6-21
Recommendation: The Technical Correlating Committee directs that the panel reconsider the proposal and act on its merits since the application discussed is not exempt under 90.2(B). This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Add a new Exception No. 2 as follows:
Exception No. 2: Where permitted in 310.7 Exception No. 2.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Comment on Affirmative:
WALL, C.: Acceptance of this comment allows nonshielded cables up to 5000 volts in conduit installations. By accepting this comment the panel is admitting that nonshielded cables can be operated and worked safely up to 5000 volts. This is contrary to their panel statement for comment 6-12 where they stated that there were hazards that arose for such cables in all locations and under all conditions.

6-28 Log #675 NEC-P06 Final Action: Accept (310.7)

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 6-23
Recommendation: The Proposal should have been Accepted and the original Panel Action to reject was correct and should be reinstated.

Substantiation: I agree with the Affirmative Comments to Accept the Proposal; they are all correct and factual.

During the discussion and Panel Action on Proposal 6-49 for the 2005 NEC, there was never any discussion by the panel regarding the 310.7 Exception. There was no discussion regarding leaving it in the Code nor revising or removing it; it was totally overlooked.

The Panel should Accept Proposal 6-23 and revise the Exception from 5000 volts to 2400 volts. Failure to correct the Exception will continue to perpetuate a conflict within the Code between 310.6, 328.10, Table 310.63 and the 310.7 Exception.

Even if the nonshielded conductors are installed in a raceway, or a metallic sheathed or armored cable, the conductors must still be separated out individually for terminations and the workers will still be exposed to the safety issues at the terminations, particularly when working on adjacent circuits while the nonshielded conductors are energized.

Table 310.63 was revised in the 2005 NEC to limit nonshielded insulated conductors to 2400 V. UL Standard 1072 was subsequently revised to require shielding in cables rated higher than 2400 volts so a cable manufacturer can no longer obtain a UL Listing for nonshielded conductors or cables rated above 2400 V. Listed nonshielded conductors rated above 2400 V are no longer available for use in metallic sheathed or armored cables nor for use in raceways.

UL Standard 2460 is being developed to provide for the use of nonshielded single conductors rated up to 5000 volts for use as factory installed wiring in equipment (internal wiring). This standard will not “cover cables that are intended for direct installation in buildings or structures in accordance with the National Electrical Code (NEC).”

Panel Meeting Action: Accept
Panel Statement: The panel does not agree with all the substantiation of the comment and acknowledges that workers should be working under the provision of NFPA 70E.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative: HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-6.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-6.
WALL, C.: The panel is disregarding the fact that the cables allowed by the exception are listed for the application and do not create an unsafe installation. The hazard that the panel wants to eliminate is the danger associated with working on live terminations. This hazard is addressed by the work procedures dictated by NFPA 70E and OSHA, not the NEC. Requiring shielded cables does not make the installation safer. Also see my statement on Comment 6-12.

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-6.
Panel Meeting Action: Reject
Panel Statement: Limiting the voltage to 2.4 kV in the exception to 310.7 for nonshielded multicore cable was inadvertently overlooked during the 2005 Code cycle. The safety concerns of using nonshielded cable are the same for underground installations as those above ground.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Huddleston, Jr., R.: See My Explanation of Negative on Comment 6-6.
Mcclung, L.: See My Explanation of Negative on Comment 6-6.
Wall, C.: See My statement on Comment 6-28
Comment on Affirmative:
cline, S.: See my affirmative comment on Comment 6-6.
Zimnoch, J.: See my affirmative comment on Comment 6-6.

6-31 Log #36 NEC-P06 (310.7 Exception) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 6-23
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative. It was the additional action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting concerning a conflict within Chapter 3. This action will be considered by the Panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The proposal should have been accepted, and the original panel action to accept was correct and should be reinstated.
In 310.7 Exception, change 5000 to 2400.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Huddleston, Jr., R.: See My Explanation of Negative on Comment 6-6.
Mcclung, L.: See My Explanation of Negative on Comment 6-6.
Wall, C.: See My statement on Comment 6-28
Comment on Affirmative:
Cline, S.: See my affirmative comment on Comment 6-6.
Zimnoch, J.: See my affirmative comment on Comment 6-6.

6-32 Log #37 NEC-P06 (310.7 Exception) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 6-24
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative. It was the additional action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting concerning a conflict within Chapter 3. This action will be considered by the Panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The proposal should have been accepted, and the original panel action to accept was correct and should be reinstated.
In 310.7 Exception, change 5000 to 2400.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Huddleston, Jr., R.: See My Explanation of Negative on Comment 6-6.
Mcclung, L.: See My Explanation of Negative on Comment 6-6.
Wall, C.: See My statement on Comment 6-28
Comment on Affirmative:
Cline, S.: See my affirmative comment on Comment 6-6.
Zimnoch, J.: See my affirmative comment on Comment 6-6.

6-33 Log #1168 NEC-P06 (310.7 Exception) Final Action: Reject
Comment on Proposal No: 6-23
Recommendation: Continue to reject this proposal.
Substantiation: See companion EEI submitted comments on Proposals 6-15, 6-19, and 6-22.

Panel Meeting Action: Reject
Panel Statement: Limiting the voltage to 2.4 kV in the exception to 310.7 for nonshielded multicore cable was inadvertently overlooked during the 2005 Code cycle. The safety concerns of using nonshielded cable are the same for underground installations as those above ground.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Huddleston, Jr., R.: See My Explanation of Negative on Comment 6-6.
Mcclung, L.: See My Explanation of Negative on Comment 6-6.
Wall, C.: See My statement on Comment 6-28
Comment on Affirmative:
Cline, S.: See my affirmative comment on Comment 6-6.
Zimnoch, J.: See my affirmative comment on Comment 6-6.

6-34 Log #1236 NEC-P06 Final Action: Accept in Principle (310.7 Exception)
TCC Action: The Technical Correlating Committee directs that the panel action on this comment be reported as “Accept in Principle” according to the panel action on Comment 5-6 on Proposal 5-18 and the term “grounding conductor” is changed to “grounding electrode conductor.” The Technical Correlating Committee understands that the revision indicated in Comment 6-34 is to the second paragraph of 310.7, not to the Exception.
Submitter: Neil F. Labrace, Jr., Syracuse, NY
Comment on Proposal No: 6-4
Recommendation: Revise 310.7 Exception as follows:
The metallic shield, sheath, or armor shall be connected to a grounding conductor, grounding busbar, or a grounding electrode grounded through an effective grounding path meeting the requirements of 250.4(A)(5) or (B)(4).
Substantiation: The revised wording proposed in this comment attempts to address the concerns expressed by the Panel in their rejection of this part. The existing language is vague and does not describe how the grounding of the cable shield is to be done. The Bonding and Grounding Task Group concluded that it is necessary to replace vague references to “shall be grounded” with more prescriptive requirements. If the proposed wording does not meet the intent of this section, the Task Group encourages the Panel to develop alternative wording that provides a prescriptive requirement.
Note: the term “grounding conductor” will have to be replaced with “grounding electrode conductor” if Proposal 5-18 continues to be accepted.
This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Bokser; Daleep Mohia; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. Labrace, Jr. The following is the minority affirmative comment by one Task Group member during the Task Group’s results balloting:
The term “grounding conductor” should be “grounding electrode conductor.” The present definition for “grounding conductor” is vague and very similar to the definition of “grounding electrode conductor.”

6-35 Log #1820 NEC-P06 Final Action: Reject (310.7 Exception)
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 6-24
Recommendation: Proposal 6-24 should have been rejected.
Substantiation: Insufficient evidence was presented to the panel to ban the use of nonshielded cable for 4160 volt applications.
Panel Meeting Action: Reject
Panel Statement: Limiting the voltage to 2.4 kV in the exception to 310.7 for nonshielded multicore cable was inadvertently overlooked during the 2005 Code cycle. The safety concerns of using nonshielded cable are the same for underground installations as those aboveground.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Huddleston, Jr., R.: See My Explanation of Negative on Comment 6-6.
Mcclung, L.: See My Explanation of Negative on Comment 6-6.
Wall, C.: See My statement on Comment 6-28
Comment on Affirmative:
Cline, S.: See my affirmative comment on Comment 6-6.
Zimnoch, J.: See my affirmative comment on Comment 6-6.
6-36 Log #38 NEC-P06  
(310.7 Exception No. 2 (New))  

Final Action: Accept  

**TCC Action:** The Technical Correlating Committee directs that the text in the comment be rewritten to comply with 4.2 in the NEC Style Manual to read as follows:  

“Exception No 2: Airfield lighting cable used in series circuits that are rated up to 5000 volts and are powered by regulators shall be permitted to be nonshielded.  

FPN: Federal Aviation Administration (FAA) Advisory Circulars (ACs) provide additional practices and methods for airport lighting.”  

Submitter: Technical Correlating Committee on National Electrical Code  

Comment on Proposal No: 6-25  

Recommendation: The Technical Correlating Committee directs that the panel reconsider the proposal and act on its merits since the application discussed is not exempt under 90.2(B). This action will be considered by the panel as a public comment.  

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.  

Panel Meeting Action: Accept  

Revise text in Proposal 6-25 to read:  

Exception No 2: Airfield lighting cable used in series circuits that are rated up to 5000 volts and are powered by regulators shall be permitted to be nonshielded, provided the practices and methods used in airfield lighting are based on Federal Aviation Administration (FAA) Advisory Circulars (ACs).  

Panel Statement: The panel concluded that the safety concerns for airfield lighting circuits justify the use of nonshielded cable as proposed.  

See the panel action on Comment 6-27.  

Number Eligible to Vote: 11  

Ballot Results: Affirmative: 11  

Comment on Affirmative:  

LAIDLER, W.: I am voting to accept this comment. However, it is my opinion that for safety reasons shielded cable should be used on voltages that exceed 2.4kv in all locations and under all conditions. This being said, because of safety concerns brought up during the panel’s discussion, relative to the uniqueness of airfield lighting installations, this exception is warranted.  

WALL, C.: By accepting this comment the panel is admitting that nonshielded cables can be operated and worked safely up to 5000 volts. This is contrary to their panel statement for comment 6-12 where they stated that there were hazards that arose for such cables in all locations and under all conditions.  

6-37 Log #182 NEC-P06  
Final Action: Action in Principle  

(310.8(D))  

**TCC Action:** The Technical Correlating Committee has revised the text of the comment to comply with 3.3 of the NEC Style Manual to read as follows:  

“(D) Locations Exposed to Direct Sunlight. Insulated conductors or cables used where exposed to the direct rays of the sun shall comply with (D)(1) or (D)(2),  

(1) Cables shall be listed, or listed and marked, as being sunlight resistant.  

(2) Cables shall be covered with insulating material, such as tape or sleeving that is listed, or listed and marked, as being sunlight resistant.”  

Submitter: Michael Walls, American Chemistry Council  

Comment on Proposal No: 6-27  

Recommendation: Proposal 6-27 should have been accepted as submitted.  

(D) Locations Exposed to Direct Sunlight. Insulated conductors or cables used where exposed to direct rays of the sun shall comply with one of the following:  

(1) Cables listed as being sunlight resistant.  

(2) Conductors listed as being sunlight resistant.  

(3) Covered with insulating material, such as tape or sleeving, that is listed as being sunlight resistant.  

Substantiation: The panel seemed to misunderstand this proposal. All that is being proposed is to get rid of words that do not add anything to the meaning or intent of the Code. What is the possible benefit of wording such as “listed, or listed and marked” can not exist unless the cable or conductor is listed, and there is not a requirement that the cable be marked - only listed. The National Electrical Code is confusing enough to read and understand without superfluous words.  

Panel Meeting Action: Accept in Principle  

Combine (1) and (2), and reword 310.8(D) to read:  

“(D) Locations Exposed to Direct Sunlight. Insulated conductors or cables used where exposed to direct rays of the sun shall comply with one of the following:  

(1) Cables listed, or listed and marked, as being sunlight resistant, or  

(2) Conductors listed, or listed and marked, as being sunlight resistant  

(3) Covered with insulating material, such as tape or sleeving, that is listed, or listed and marked, as being sunlight resistant.”  

Panel Statement: This editorial consolidation of text does not change any of the existing requirements.  

The terminology “listed, or listed and marked,” is desired by the panel. Either of the two conditions exist depending on the applicable paragraph. If, and without the second condition being included, an inspector has no readily available way of knowing which condition applies. The panel statement on Proposal 6-27 correctly stated that: “Some standards require products to be marked “sunlight resistant” while others do not.” For instance, an SE cable is required to be sunlight resistant without a marking, whereas a jacketed metal clad cable is not sunlight resistant unless so marked.  

The panel action agrees with the negative vote on Proposal 6-27 to delete words that do not change the meaning.  

Number Eligible to Vote: 11  

Ballot Results: Affirmative: 11  

6-38 Log #182 NEC-P06  
Final Action: Reject  

(310.10, FPN )  

Submitter: Michael Walls, American Chemistry Council  

Comment on Proposal No: 6-29  

Recommendation: Proposal 6-29 should have been rejected.  

Substantiation: A fine print note (FPN) referencing that there is a possibility that some conduits may cause conductors to become warmer than ambient temperatures is appropriate in the NEC.  

Panel Meeting Action: Reject  

Panel Statement: See the panel action and statement on Proposal 6-51. FPN No. 2 is no longer needed because the concept was incorporated in the 310.15(B)(2)(c) text.  

Number Eligible to Vote: 11  

Ballot Results: Affirmative: 8 Negative: 3  

Explanation of Negative:  

HULDENDORST, JR., R.: The panel obviously brought into the study performed which showed that the air space inside of conduits run in close proximity to rooftops heats up in the sunshine. However, the de-rating factors in the original proposal which were accepted by the Panel fail to acknowledge that existing de-rating for ambient temperatures already taken into consideration heating of air space inside of conduits. This is amply evidenced by the fact that no data was presented to the Panel showing that failures were occurring in the field in rooftop conduits. The Panel discussed some anecdotal examples where they thought maybe they remembered a failure of a wiring system and now, in hindsight, it may have been caused by the air space inside of the conduit heating up in the sunshine - maybe. Is this the way major changes to the National Electrical Code are supposed to be made? It is this Panel member’s opinion that changes must be made with deliberation and that legitimate technical substantiation of a real problem exists with the current NEC. The de-rating factors accepted by the Panel are way out of line with reality, and it is disappointing to see how the Panel made this decision.  

The study this Proposal was based on was conducted using a limited range of conduit sizes and only included conduits inside the conduit. The study did not compare the effect of heating from various roof pitches or even different roof colors, and thus was woefully inadequate. Despite the limitations of the study, the rule was written to apply to all conduit sizes for both single conductors and multi-conductor cables. There was no testing to determine whether there was any evidence of deterioration of insulation or if an unsafe or deteriorated condition existed. To be so broadly applied, this study should have been much more thorough, included evidence of insulation deterioration, and the results should be independently verified rather than assuming the results of one study are correct. Essentially, the Proposal changes the long established definition of ambient temperature without justification.  

MCCLUNG, L.: Present wording in the Code is adequate to direct the qualified user to make appropriate adjustments to the ampacity for the temperature of its installation (for example, conduits on rooftops). Industrial users have been applying appropriate conductors safely and reliably for many years in these applications. No reputable field failure data was submitted to support the results of the experimental testing. The data submitted to the Panel covered one site specific application where it was recognized that the intense sunlight had immediate effect on the temperature rise in the conduit.  

Recognizing that the conductor temperance adders found in Table 310.15(B)(2)(c) are based on solar radiation of a single site tested condition, it is conceivable that impingement angle of the sun, roofing material and color, wind speed, atmosphere conditions, etc., will vary with location, thus directly affecting the ambient temperature and its associated ampacity. Additional site testing should be performed before making such a drastic change to the Code (i.e., a, 60 A load that has normally been wired using a #6 AWG, 90 Deg C wire, i.e. #2 AWG, 90 Deg C wire). Such a drastic change would result in a mismatch of conductor and terminal sizing unless a reducer lug or splice is inserted at or prior to the termination.  

WALL, C.: The FPN in the code is appropriate, much more so than the action taken on comment 6-45 and comment 6-46. Also see my reason for negative vote on comment 6-45.  

Comment on Affirmative:  

CLINE, S.: Many anecdotal substantiations were submitted. These do not meet an acceptable level of technical evidence. The testing data submitted with the base proposal was substantive and accepted.  

6-39 Log #885 NEC-P06  
Final Action: Reject  

(310.10, FPN 2)  

Submitter: David Wechsler, The Dow Chemical Company  

Comment on Proposal No: 6-30  

Recommendation: Retain the current FPN No. 2 and reject this and Proposal 6-51.  

FPN No. 2: Conductors installed in conduit exposed to direct sunlight in close proximity to rooftops have been shown, under certain conditions, to experience a temperature rise of 17°C (30°F) above ambient temperature on which the ampacity is based.
Substantiation: This FPN provides a needed warning. The solution may not necessarily require a different electrical installation, but may be a different physical installation using, but not limited to a sun shield of some kind.

The data and test work that has been performed to support this proposal is an excellent example of good scientific project work. It clearly demonstrates that the sun can heat up objects and depending on the surroundings the heat buildup may be more than what might have been considered. While the details of the sun causing heat build up with an electrical conduit may not have been fully documented until now, many are familiar with heat buildups in such places as attics, crawl spaces, etc.

However, what seems to be is missing from the data findings are not the fact that the temperature within a conduit was recorded as rising, but what in fact happens at the terminations and with the temperature of the conductors. What adverse effect has been documented that would make the current practice unsafe? The sun has been around for a bit longer than this code language, but where is the data that demonstrates a real installation/safety problem? After all, implementing this proposal seems to result in a derating factor of almost 30 percent and it would be hoped that the committee has recognized that there was a major serious problem with this type of installation. In contacting more than a dozen electrical industrial contractors serving the Texas Gulf Coast area from Brownsville to Baytown, which does have some pretty hot summers, no one could cite any case where the hot temperatures had produced a faulty electrical installation. (i.e., they had no repair calls to replace wiring installations on roof installations).

Lastly, FPN No. 1 of this section indicates that derating must include more than just the temperature of the air. It states: “The principal determinants of operating temperature are as follows:

1. Ambient temperature — ambient temperature may vary along the conductor length as well as from time to time.
2. Heat generated internally in the conductor as the result of load current flow, including fundamental and harmonic currents.
3. The rate at which generated heat dissipates into the ambient medium.
4. Thermal insulation that covers or surrounds conductors affects the rate of heat dissipation.

5. Adjacent load-carrying conductors — adjacent conductors have the dual effect of raising the ambient temperature and impeding heat dissipation.”

The complete information needed to support the proposed change seems lacking.

For these reasons, this proposal and Proposal 6-51 should have been rejected. See comment made on 6-51.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comments 6-38 and 6-48.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.

MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.

WALL, C.: See my statement on comment 6-38.

Comment on Affirmative:

CLINE, S.: See my affirmative comment on Comment 6-38.

2-272 Log #39 NEC-P02

Final Action: Accept (310.12, FPN (New))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 6-33

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 2 for Action. This action will be considered by Code-Making Panel 2 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

The panel accepts the direction of the Technical Correlating Committee and Rejects Proposal 6-33.

Panel Statement: See the panel action and statement on Comment 2-14.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

KING, D.: See my explanation of negative on Comment 2-14.

6-41 Log #284 NEC-P06

Final Action: Accept in Principle (310.13)

Submitter: Code-Making Panel 5, Comment on Proposal No: 6-7

Recommendation: Accept the proposal wording as revised. Equipment grounding conductors shall be permitted to be sectioned within a listed multi-conductor cable provided the combined circular mil area in each cable section complies with 250.122.

Substantiation: CMP-5 supports the revised text developed by CMP-6 and the action taken on this proposal to Accept in Principle in Part. CMP-5 supports CMP-6’s recognition that listed multiconductor cables with sectioned equipment grounding conductors are permitted where the combined circular mil area complies with 250.122. CMP-5 also supports CMP-6’s actions to not accept the submitter’s proposed text where the paralleling of MC cables was proposed. For clarity purposes, CMP-5 notes that the 1/0/AWG sizing requirement in 310.4 does not apply to equipment grounding conductors; where phase conductors are run in parallel, a full size equipment grounding conductor sized per 250.122 must be installed in each raceway or cable.

This comment has been balloted through CMP-5 with the following ballot results:

15 Eligible to Vote

14 Affirmative

1 Not Returned (W. Helfrich)

Mr. D. Mohla voted affirmatively stating: “Change the word “recognition” in line 2 of the CMP-5 statement to “acceptance”.

Delete the second sentence in the CMP-5 statement starting from CMP-5 also supports CMP-6’s actions...MC cables was proposed. There is no reference or mention of MC cable or paralleling of MC Cable either in the proposal or CMP-6 action.”

Mr. D. Brendler voted affirmatively stating: “Affirm Panel 5 action to accept, but revise the proposed additional paragraph to 310.13 to read: “Equipment grounding conductors shall be permitted to be sectioned within a listed multi-conductor cable or flexible cord provided the conductor sections are identical and the combined circular mil area of the sections are not smaller than required by complies with 250.122.”

Substantiation: Sectioned equipment grounding conductors are often used in flexible cords as well as in metal-clad cables. This section needs to provide for that use. The section needs to require that where the equipment grounding conductor is sectioned, all sections are identical so any ground-fault current will be carried equally by each section. The last proposed language addition is intended to be an editorial improvement.”

Panel Meeting Action: Accept in Principle

The panel action on Proposal 6-7 relocated the revised requirement into 310.13, which addresses the construction of a Type MC cable. See the panel action on Comments 6-2 and 6-3.

Panel Statement: The panel action on Proposal 6-7 relocated the revised requirement to 310.13, which addresses the construction of a Type MC cable. See the panel actions and statements on Comments 6-2 and 6-3.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

The panel accepts the direction of the Technical Correlating Committee and Rejects Proposal 6-33.

Panel Statement: See the panel action and statement on Comment 2-14.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12
In 396.10(B)(1), revise Table 310.13(C) to Table 310.13(B).

In 310.10 FPN, revise Table 310.13(B) to Table 310.13(C).

Code-Making Panel 12:
In 328.100, revise Table 310.13(B) to Table 310.13(C).

Code-Making Panel 7: 320.104 and 322.112 refer to Table 310.13(A) – no change required.

Correct the title of Table 310.13(D) (formerly Table 310.63) from “Table 336.104 – revise Table 310.13(C) to Table 310.13(B).

Code-Making Panel 19 – 552.10(B)(2) and 675.4(A) – no change required.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-43 Log #676 NEC-P06  Final Action: Accept in Principle
(310.13, 310.6 Exception, 310.10, 310.15, Tables 310.16-310.20, Tables 310.67 through 310.86)

Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 6-40a
Recommendation: The proposal should be Accepted in Principle with the following changes in the titles of the following tables:
Correct the title of Table 310.13(C) (formerly Table 310.62) from “Thickness of Insulation for 601- to 2000-Volt Nonshielded Types RHH and RHW” to “Thickness of Insulation for Nonshielded Types RHH and RHW Solid Dielectric Insulated Conductors Rated 2000 Volts.”
Correct the title of Table 310.13(D) (formerly Table 310.63) from “Table 310.13(D) Thickness of Insulated Conductors Rated 2400 Volts and Jacket for Nonshielded Solid Dielectric Insulation” to “Table 310.13(D) Thickness of Insulation and Jacket for Nonshielded Solid Dielectric Insulated Conductors Rated 2400 Volts.”

Substantiation: Revising the titles will provide consistent wording between Tables 310.13(C), 310.13(D), and 310.13(E).

Revising the title of Table 310.13(D) will also more accurately convey the information provided in the table. The present title “Thickness of Insulated Conductor” implies that it includes both the conductor and the insulation, which is not correct. The revised title correctly states that the table provides the thickness of the insulation and jacket.

Panel Meeting Action: Accept in Principle
In addition to accepting the comment, the panel reverses the table numbers and location of Tables 310.13(B) and 310.13(C).
In 328.100, revise Table 310.13(B) to Table 310.13(C).
In 310.10 FPN, revise Table 310.13(B) to Table 310.13(C).
In 310.15(B)(1) revise Table 310.13(C) to Table 310.13(B).
In Tables 310.16 through 310.86, revise Table 310.13(B) to Table 310.13(C) in the first line of each Table.
In 336.104, revise Table 310.13(C) to Table 310.13(B).
In 396.10(B)(1), revise Table 310.13(C) to Table 310.13(B).

Panel Statement: The revisions made in this comment are editorial only. Reversing Tables 310.13(B) and (C) provides a more logical sequence of increasing voltage.

The other revisions in the panel action provide correlation with the panel action on this comment.

NFPA staff should make the following editorial correlations and refer the panel action to the appropriate panels for information:
Code-Making Panel 5 – 300.3(A) – no change required.
Code-Making Panel 7: 320.104 and 322.112 refer to Table 310.13(A) – no change required.
328.100 – revise Table 310.13(B) to Table 310.13(C).
330.112(A) and (B), 334.112, 340.112 – no change required.
336.104 – revise Table 310.13(C) to Table 310.13(B).
396.10(B) – revise Table 310.13(C) to Table 310.13(B).

Code-Making Panel 12:
610.13 – no change required.

Note to Table 610.13(A) – revise Table 310.13 to Table 310.13(A).


Code-Making Panel 19 – 552.10(B)(2) and 675.4(A) – no change required.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-45 Log #1070 NEC-P06  Final Action: Accept in Principle
(310.15(B)(2)(1))

“TCC Action: The Technical Correlating Committee directs that the FPN be identified as “FPN to Table 310.15(B)(2)(c)” and located immediately following Table 310.15(B)(2)(c).

The Technical Correlating Committee directs that the second sentence of the FPN be deleted as it can be interpreted as a requirement.

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 6-51
Recommendation: Accept the new text as revised by the CMP, but add the following Fine Print Note, in accordance with Mr. Kent’s comment:

Ave: ‘the numbers on which the recommendations are based are the result of averaging; those wishing to avoid all risk of damaging overheating of conductor insulation will take into account the most-extreme sustained temperatures in their localities.

Substantiation: Maximum temperatures obtained from reliable sources such as the National Oceanographic and Atmospheric Administration (USNOAA) are not instantaneous temperatures, but rather temperatures sustained long enough to potentially cause irreversible changes to conductor insulation, according to CDA experts I consulted. A local USNOAA expert warned, moreover, that the maximum temperatures they record are increasing. I agree that the submitter was not seeking full protection, but my understanding is that this was a matter of real politik, just trying to get something passed.

Panel Meeting Action: Accept in Principle
Add FPN immediately before the Table to read “FPN: The temperature adders in Table 310.15(B)(2)(c) are based on the results of averaging the ambient temperatures. The highest sustained ambient temperature in the location should be considered to minimize the risk of damage to the insulation by overheating.”

Panel Statement: The addition of the FPN responds to the Comments on Alternative votes on Proposal 6-51 by G. Kent and W. Laider and was revised for clarity. This action as written provides what the submitter has requested, and is placed where appropriate.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

6-44 Log #471 NEC-P06  Final Action: Rejected in Principle
(310.15(4)(a))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 6-44
Recommendation: Accept proposal.
Substantiation: A common neutral may carry current the same as individual neutrals but only unbalanced currents. The proposal would clarify that the provision of 310.15(B)(4)(a) apply to the neutral of more than the circuit of that section.

Panel Meeting Action: Reject
Panel Statement: The submitter is not clear on what neutrals or what type of circuits within his substantiation he wants the panel to address. It is possible for the neutral to be a current-carrying conductor as in 310.15(B)(4)(b) and 310.15(B)(4)(c).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-42 Log #2110 NEC-P06  Final Action: Accept
(Table 310.13)

Submitter: Joe Zimmoch, The Okonite Company
Comment on Proposal No: 6-63
Recommendation: Change title of Table 310.13 to read: ‘Conductor Applications and Insulations Rated 600 Volts’
Substantiation: Currently, 310.13 and Table 310.13 do not show a voltage rating.

Panel Meeting Action: Accept
Panel Statement: The panel understands that the comment is on Proposal 6-40a, rather than 6-63, and the requested change in title applies only to Table 310.13(A) and not Table 310.13(B) which includes conductors rated higher than 600 V.

The words “Rated” was added in the panel action on Proposal 6-40a. The panel agrees that Table 310.13(A) only includes conductors rated 600 V and does not include conductors rated less than 600 V and the revised title is consistent with the titles of the other 310.13 Tables.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

HUFFLEDSTON, JR., R.: See My Explanation of Negative on Comment 6-38.

MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.

WALL, C.: Documented evidence of actual failures of conductors installed on rooftops in the field was not provided. Only a non-peer reviewed study was provided by those that will potentially benefit from this change.

The study, “Effect of Rooftop Exposure on Ambient Temperatures Inside Conduits”, states that “Failure is defined as exceeding the temperature rating of a given cable…” , and quotes NEC section 310.10 as the reference. This is an inappropriate NEC section. NEC section 310.10 FPN No. 1 states: “The temperature rating of a conductor (see Tables 310.13 and 310.61) is the maximum temperature, at any location along its length, that the conductor can withstand over a prolonged time period without serious degradation.” It is the long term exceeding of the conductor temperature rating that causes degradation of the insulation and ultimate failure. The study did not provide information on the time period that the temperatures in the conduits were sustained; therefore, the study rushed to a conclusion that the conductors would fail when the conductor temperature rating was exceeded. Neither did the study make observations of the condition of the insulation of the conductors in the conduits to determine whether failure had occurred. Temperature rating of conductors are determined utilizing the appropriate UL standards such as UL 1581. Following the requirements of UL 1581, a 90°C conductor temperature rating would be determined in part by checking insulation elongation after heating samples of the conductor to 102% of its rating for intervals of 90, 120 and 150 days. By deduction, a conductor
can exceed its temperature rating for prolonged periods of time. Additionally, UL 83 requires that a 90°C conductor undergo a heat shock test by heating to 120°C for one hour and being observed for cracks; the implication being that exceeding the temperature rating for short periods of time does not cause failure.

The study informs the reader that temperatures in RNC were higher than those in EMT. If that is the case, should RNC even be permitted on rooftops, or should there be different adjustment factors for RNC? Additionally, the study found that light colored roofs cause higher temperatures in conduits, but the design makes no provision for this.

After reviewing the study one has to question the statistical validity of the study. It would be refreshing to see the cable manufacturers conduct a legitimate study in cooperation with the conduit manufacturers and a nationally recognized testing laboratory.

Under the proposed de-rating methodology, conductors rated 75°C at an ambient of 30°C, run across a roof with ½” of clearance must be de-rated to 33 percent of Table 310.16 ampacity. Such a change is unwarranted and puts an unnecessary burden on the end use customer.

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-38.

Panel Meeting Action: Accept in Principle
Panel Statement:

6-46 Log #470 NEC-P06 Final Action: Accept in Principle (310.15(B)(2)(b))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 6-47
Recommendation: Accept proposal.
Substantiation: The panel statement affirms the proposal substantiation; separate aggregate lengths are not intended to contribute to the 24 in. length requirement.
Panel Meeting Action: Accept in Principle
The panel accepts the addition of the words “a continuous length” and revises the exposure? There are a myriad of other questions that would impact how to applied. How many hours per day exposed or shaded? What time of day is and installation of conductors on rooftops for over 30 years and witnessed no more costly and difficult to design and install? I was involved in maintenance on years and years of operations, why penalize users by making installations

Panel Statement: The panel action will also correlate with the Panel 1 action on Proposal 1-19.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-47 Log #40 NEC-P06 Final Action: Accept (310.15(B)(2)(c))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 6-51
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comments 6-45, 6-48 and 6-54.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.

6-48 Log #57 NEC-P06 Final Action: Reject (310.15(B)(2)(c))

Submitter: William M. Lewis, Martinsville, IN
Comment on Proposal No: 6-51
Recommendation: Proposal 6-51 should have been Rejected.
Substantiation: The issue raised in the proposal has not created a problem of failure of conductors installed on rooftops. If there are no failures based on years and years of provision, why penalize users by making installations more costly and difficult to design and install? I was involved in maintenance and installation of conductors on rooftops for over 30 years and witnessed no problems. Also, if the rule does stay, it is very inexact as to how it is to be applied. How many hours per day exposed or shaded? What time of day is the exposure? There are a myriad of other questions that would impact how to apply the rule.
Panel Meeting Action: Reject
Panel Statement: Correction for ambient temperature has always been required but guidance for determining the ambient temperature for use in applying the ampacity correction factors was never provided. The Panel Action on Proposal 6-51 provided a technical basis for establishing the ambient temperature in one specific type of installation that could be used for ampacity correction.

The proposal and the data provided with it show that there is an elevated exposure to heat when conductors are installed in a raceway in close proximity to a roof. This increase in temperature is exacerbated by the normal condition of the installed conductors when carrying current. This new language is nothing more than an improvement on the existing requirements. 310.10 requires that the maximum temperature of any conductor not be exceeded. Under Article 100, definition of Ampacity, “The current, in Amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating”, is not dependent on time.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.
WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-38.

6-49 Log #617 NEC-P06 Final Action: Reject (310.15(B)(2)(c))

Submitter: Ken Garr, Bruce Township, MI
Comment on Proposal No: 6-51
Recommendation: Delete the proposed new text and table.
Substantiation: This is a major proposed change - backed up with one study. The study does seem to have been carefully done. But, it is hard to avoid the question: for such a big change, with so much practical field experience, is there any known history of failures?
When one agrees with a code proposal, one says, “Of course.” On the other hand, a common response to a proposal that one disagrees with is, “Where are the statistics to back this up?” In this case, we do have some statistics, but it seems like a very big change to make on the basis of one study.
Panal Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-48.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.
WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-38.

6-50 Log #753 NEC-P06 Final Action: Accept in Principle (310.15(B)(2)(c))

Submitter: Thomas Thierheimer, Britain Electric Co.
Comment on Proposal No: 6-51
Recommendation: I support the concept of the proposal, however, there are many variables such as geographic location, altitude, color of roof, slope of roof, wind speed, etc., that all have an influence on the cooling or heating of the conduit due to external conditions. The process does not need to be complicated. I suggest that the design process be simplified because there can be many variations in the roof selection due to the general contractor and the roofing contractor. Most of the variations will not, typically, be known or communicated to the electrical designer at the time the electrical design is completed.
I recommend that (as a more practical/simpler approach) the designer choose the maximum ambient temperature for the location of the project and add 30°F or 17°C to the maximum ambient temperature to arrive at the ambient temperature to be used in the NEC tables.
Example:
Maximum ambient temperature in Houston Texas (as selected by designer)=105°F. Conduit is routed across a roof that may be exposed to direct sunlight.
Add 30°F to this ambient for a 135°F “Effective Ambient Temperature”.
Ambient Correction Factor (Table 310.16)=.71 for 90°C Wire Insulation, Using a #8 AWG THHN/THWN 90°C Copper wire, in dry conditions (not underground) (3 current carrying conductors), The wire ampacity is 55 Amperes (Table Ampacity) X.71 = 39 Amperes (see note below)
If there were more than 3 current carrying conductors in the conduit, the ampacity would then require an additional adjustment according to Table
6-51 Log #799 NEC-P06 Final Action: Reject
(310.15(B)(2)(c))

Submitter: Richard E. Loyd, Sun Lakes, AZ

Comment on Proposal No: 6-51

Recommendation: Revise to read as follows:
(c) Conduits and Cable Exposed to Sunlight on Rooftops. Where conduits or open runs of cable are exposed to sunlight on or above rooftops, (remainder of section unchanged.)

Substantiation:
If conductors and cables in conduit require the proposed temperature adjustments, then the adjustments should also apply to open runs of cable. It is not necessary to have text relative to conductors or cables in conduit - that is the purpose of the condition CDA (Copper Development Assn.) presented a seminar on the testing and results in Philadelphia at the Eastern Section of the IAEI meeting September 30, 2006. The presenter was asked if they tested MC cable and if so how did it perform in comparison to conduit. The response was Yes and he then proceeded to show a chart comparing Type MC cable with the raceways and pointed out to the audience the chart showed conductors in MC cable temperature was slightly high than the conductors in Raceway.

Panel Meeting Action: Reject
Panel Statement: The test data submitted with Proposal 6-51 only contained test results obtained with conduit exposed to sunlight on rooftops and no supporting data has been submitted on multicore cables in similar installations to determine whether the adjustment would be the same, more, or less than for conduit.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-52 Log #884 NEC-P06 Final Action: Reject
(310.15(B)(2)(c))

Submitter: David Wechsler, The Dow Chemical Company

Comment on Proposal No: 6-51

Recommendation: Reject this and Proposal 6-30.

Substantiation: The data and test work that has been performed to support this proposal is an excellent example of good scientific project work. It clearly demonstrates that the sun can heat up objects and depending on the surroundings the heat buildup may be more than what might have been considered. While the details of the sun causing heat build up with an electrical conduit may not have been fully documented until now, many are familiar with heat buildups in such places as attics, crawl spaces, etc. However, what seems to be missing is the data findings are not the fact that the temperature within a conduit was recorded as rising, but what in fact happens at the terminations and with the temperature of the conductors. What adverse effect has been documented that would make the current practice unsafe? The sun has been around for a bit longer than this code language, but where is the data that demonstrates a real installation/safety problem? After all, implementing this proposal seems to result in a derating factor of almost 30 percent and it would be hoped that the committee has recognized that there was a major serious problem with this type of installation. In contacting more than a dozen electrical industrial contractors serving the Texas Gulf Coast area from Brownsville to Baytown, which does have a pretty hot summer, no one could cite any case where the hot temperatures had produced a faulty electrical installation. (i.e., they had no repair calls to replace wiring installations on roof installations).

Lastly, FPN No. 1 of 310.10 indicates that derating must include more than just the temperature of the air. It states: “The principle determinants of operating temperature are as follows:
(1) Ambient temperature — ambient temperature may vary along the conductor length as well as from time to time.
(2) Heat generated internally in the conductor as the result of load current flow, including fundamental and harmonic current.
(3) The rate at which generated heat dissipates into the ambient medium. Thermal insulation that covers or surrounds conductors affects the rate of heat dissipation.
(4) Adjacent load-carrying conductors — adjacent conductors have the dual effect of raising the ambient temperature and impeding heat dissipation.”

The complete information needed to support the proposed change seems lacking.

For these reasons, this proposal and Proposal 6-30 should have been rejected. See comment made on 6-30.

Panel Meeting Action: Reject
Panel Statement: Proposal 6-51 only addresses ambient temperature. The concerns addressed in the test report refer to the increased ambient temperature and did not demonstrate any resulting effect on terminations. Actual field testing shows that there is a standard and calculable heating effect from the sun on conductors installed in conduits on rooftops. 310.15 requires correction for the effects of heating when these effects are known. Correction for ambient temperature has always been required but guidance for determining the ambient temperature for use in applying the ampacity correction factors was never provided. The Panel Action on Proposal 6-51 provided a technical basis for establishing the ambient temperature in one specific type of installation that could be used for ampacity correction. See Panel Statement on Comment 6-48.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Substantiation:
See Panel Statement on Comment 6-48.

Panel Meeting Action: Reject
Panel Statement: Proposal 6-51 only addresses ambient temperature. The concerns addressed in the test report refer to the increased ambient temperature and did not demonstrate any resulting effect on terminations. Actual field testing shows that there is a standard and calculable heating effect from the sun on conductors installed in conduits on rooftops. 310.15 requires correction for the effects of heating when these effects are known. Correction for ambient temperature has always been required but guidance for determining the ambient temperature for use in applying the ampacity correction factors was never provided. The Panel Action on Proposal 6-51 provided a technical basis for establishing the ambient temperature in one specific type of installation that could be used for ampacity correction. See Panel Statement on Comment 6-48.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Substantiation:
See Panel Statement on Comment 6-48.

Panel Meeting Action: Reject
Panel Statement: Proposal 6-51 only addresses ambient temperature. The concerns addressed in the test report refer to the increased ambient temperature and did not demonstrate any resulting effect on terminations. Actual field testing shows that there is a standard and calculable heating effect from the sun on conductors installed in conduits on rooftops. 310.15 requires correction for the effects of heating when these effects are known. Correction for ambient temperature has always been required but guidance for determining the ambient temperature for use in applying the ampacity correction factors was never provided. The Panel Action on Proposal 6-51 provided a technical basis for establishing the ambient temperature in one specific type of installation that could be used for ampacity correction. See Panel Statement on Comment 6-48.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Substantiation:
See Panel Statement on Comment 6-48.

Panel Meeting Action: Reject
Panel Statement: Proposal 6-51 only addresses ambient temperature. The concerns addressed in the test report refer to the increased ambient temperature and did not demonstrate any resulting effect on terminations. Actual field testing shows that there is a standard and calculable heating effect from the sun on conductors installed in conduits on rooftops. 310.15 requires correction for the effects of heating when these effects are known. Correction for ambient temperature has always been required but guidance for determining the ambient temperature for use in applying the ampacity correction factors was never provided. The Panel Action on Proposal 6-51 provided a technical basis for establishing the ambient temperature in one specific type of installation that could be used for ampacity correction. See Panel Statement on Comment 6-48.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Substantiation:
See Panel Statement on Comment 6-48.
Some examples of the effect on conductor ampacity when the temperature adders for conductors in raceways in direct sunlight on rooftops are shown below.

Example #1:
3/C 12 AWG THHW-2 in 1/2 in. RNC or EMT installed with the bottom of the RNC or EMT 1/2 in. or less above the rooftop (most severe condition)
Table 310.16 90°C ampacity = 30 amps @ ambient temperature of 30°C
Temperature adder from Table 310.15(B)(2)(c) for raceway location = 17°C
Adjusted ambient temperature = 47°C (30°C + 17°C)
Table 310.16 Correction Factor for 47°C ambient, 90°C conductor = 0.82
Adjusted ampacity (30 amps × 0.82) = 24.6 amps

Example #2:
3/C 500 kcmil THHW-2 in 2 1/2 in. RNC or EMT (NEC Table C.1) installed with the bottom of the RNC or EMT 3 1/2 in. to 12 in. above the rooftop.
Table 310.16 90°C ampacity = 430 amps @ ambient temperature of 30°C
Temperature adder from Table 310.15(B)(2)(c) for raceway location = 17°C
Adjusted ambient temperature = 47°C (30°C + 17°C)
Table 310.16 Correction Factor for 47°C ambient, 90°C conductor = 0.82
Adjusted ampacity (430 amps × 0.82) = 353 amps

Comparison: Table 310.16 75°C ampacity = 380 amps @ ambient temperature of 30°C

Panel Meeting Action: Accept in Principle
Insert a new FPN immediately following (c) to read: “FPN No. 1: One source for the average ambient temperatures in various locations is the ASHRAE Handbook – Fundamentals.”

Panel Statement: The FPN was added to provide a reference on where the temperature might be obtained and responds to the Comment on Affirmative vote by W. Laidler.
See panel action and statement on Comment 6-45 that added a FPN, which now should be identified as FPN No. 2.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
H. HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.
WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-38.

6-55 Log #1826 NEC-P06 Final Action: Reject
(submitted by Travis Lindsey Consulting Services)

Panel Statement: The FPN was added to provide a reference on where the temperature might be obtained and responds to the Comment on Affirmative vote by W. Laidler.
See panel action and statement on Comment 6-45 that added a FPN, which now should be identified as FPN No. 2.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
H. HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.
MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.
WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:
CLINE, S.: See my affirmative comment on Comment 6-38.
Using This Proposal: 1/0 Conductors - 2" conduit

Does it really make sense to expect owners of companies to pay this much more to fix a problem that obviously does not really exist in the first place?

Substantiation: The implications to users of conduit/wire systems of this proposal are onerous. A derating to 33% of Table 310-16 ampacity for conductors run in conduits across roofs is completely unwarranted and verges on the ridiculous. Exactly what is the problem that we are trying to fix here?

In the experience of ACC member companies, there has not been a single documented failure of conductors run in conduits across roofs that could be attributed to overheating. Existing derating according to ambient temperatures more than compensates for ampacity adjustments needed.

Industrial users of the NEC will be affected in installations to rooftop blowers and HVAC units, as well as other rooftop-mounted devices. This proposal does not address any real problem - only one that was perceived and dreamed up by those who would benefit from the use of larger copper for installations.

Here is an example of how this proposal, if accepted, would affect installations:

A current installation consists of a rooftop ventilation fan, mounted on top of an industrial building. Roof construction is flat roof, gravelled. Conduit runs approximately 200' from an electric room up through the building, and then passes 25' directly on the gravelled roof. Size of the fan motor is 30 HP, with full-load amperes being 40 AMPS. 4 - #8 AWG THHW conductors are currently installed in a 3/4" Rigid Metal Conduit (RMC) system, with liquid-tight flexible metallic conduit used between the motor junction box and the conduit. All of this meets the 2005 NEC.

Under the rules of this proposal, the temperature adjustment for the conductors would be 33 degrees C (60 degrees F). It is assumed that the ambient temperature is 78 - 86 degrees F (26 - 30 degrees C); thus, no temperature correction would normally be needed. However, a 33 degree C correction would make the new temperature for ampacity considerations 30 + 33 = 63 degrees C. Type THHW insulation would thus have an ampacity of 0.33 times that shown in Table 310.16, according to the correction factor table at the bottom of 310.16

The ampacity needed to provide power for the motor is 1.25 x 40 = 50 amperes. To find the conductor size using the temperature correction required by this proposal, it is necessary to divide 50 by 0.33, which yields 151.5 amperes. Using Type THHW conductors, Table 310.16 requires the size to be 1/0 THHW (which is good for 150 amperes).

Reframing back to Table C.8 in the 2005 NEC, a 2" Rigid Metal Conduit will be required to install the 4 - 1/0 conductors.

Current 2005 NEC: #8 AWG Conductors - 3/4" conduit

Using This Proposal: 1/0 Conductors - 2" conduit

An actual cost comparison was made between these installations using REAL numbers. This estimate was performed by our construction contractor estimator.

3/4" Conduit - 4 #8 AWG THHW Conductors:

- Material: $459.46
- Labor: $2033.20
- Total: $2492.66

2" Conduit - 4 1/0 THHW Conductors:

- Material: $1747.60
- Labor: $2948.40
- Total: $4696.00

Difference of $2203.34, or an 88% INCREASE IN INSTALLED COST.

Of course, a 2" conduit will not terminate in a 30 HP motor junction box, so a larger box would need to be constructed in order to accommodate the conduit size.

Does it really make sense to expect owners of companies to pay this much more to fix a problem that obviously does not really exist in the first place?

Panel Meeting Action: Reject

Panel Statement: 310.15(B)(2)(c) does not mandate that the conduit be placed directly on the roof. In fact, Table 310.15(B)(2)(c) provides the user with conditions of installation to minimize the effect on conduits exposed to sunlight on rooftops. This requirement is only applicable for the conduit on the rooftop exposed to the sunlight. Because of this, it is possible the user could change conditions of installation to minimize the effect on conduits exposed to sunlight. This requirement is only applicable for the conduit on the rooftop directly on the roof. In fact, Table 310.15(B)(2)(c) provides the user with additional clarification on the average ambient temperature to be used.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.

WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:

CLINE, S.: See my affirmative comment on Comment 6-38.

6-56 Log #1840 NEC-P06  Final Action: Reject

310.15(B)(2)(c)

Submitter: Mike Holt, Mike Holt Enterprises, Inc.

Comment on Proposal No: 6-51

Rejection of the Proposal.

Substantiation: Mr. McClung’s statements should be reconsidered by the panel at large. Are there any documented cases of this being an issue? The panel should not accept anecdotal substantiations and should instead value the track record of existing installations.

As written in the proponent’s substantiation, there are already existing NEC rules that govern conductors installed in high ambient temperatures. This is one location where Article 310 should continue to use a performance based requirement (310.10) as opposed to a prescriptive one (proposed).

Panel Meeting Action: Reject

Panel Statement: As stated by the submitter there are already high ambient temperature adjustments required by the NEC. Correction for ambient temperature has always been required but guidance for determining the ambient temperature for use in applying the ampacity correction factors has not been provided. The Panel Action on Proposal 6-51 provided a technical basis for establishing the ambient temperature in one specific type of installation that could be used for ampacity correction and the Panel Actions on Comments 6-45 and 6-54 provide additional clarification on the average ambient temperature to be used.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

HUDDLESTON, JR., R.: See My Explanation of Negative on Comment 6-38.

MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.

WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:

CLINE, S.: See my affirmative comment on Comment 6-38.

6-57 Log #2211 NEC-P06  Final Action: Reject

310.15(B)(2)(c)

Submitter: William A. Wolfe, Steel Tube Institute of North America

Comment on Proposal No: 6-51

Recommendation: If the Panel continues to accept this proposal, revise the text to read as follows:

(c) Conduit and Cable Exposed to Sunlight on Rooftops. Where open runs of cables or conductors or cables #3 installed in conduits are exposed to direct sunlight on or above rooftops, the adjustments shown in Table 310.15(B)(2)(c) shall be added to the outdoor temperature to determine the applicable ambient temperature for application of the correction factors in Tables 310.16 and 310.18.

Table 310.15(B)(2)(c) Ambient Temperature Adjustment for Conduits and Cables Exposed to Sunlight On or Above Rooftops.

Substantiation: Based on presentations by the submitter of this proposal at IAEI Section meetings this Fall, it is our understanding that in addition to conduit, some cables were tested as exposed runs and showed a need for derating. This data was not included, however, in the study that was submitted as substantiation for Proposal 6-51. Since there are other types of products that may be installed on rooftops, the panel should review test results for those products as well to determine the derating necessary. If this cannot be determined in this code cycle, this proposal should be held for further study. For years there has been no requirement for derating conductors in conduits on rooftops and no field problems have been shown to exist. Delaying consideration of this proposal until this study of all products is complete will not be detrimental.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 6-51.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-58 Log #354 NEC-P06  Final Action: Accept in Principle

310.15(B)(2)(a), FPN No. 2

Submitter: Code-Making Panel 8,

Comment on Proposal No: 6-52

Recommendation: CMP-8 supports the action on this proposal by CMP-6.

Substantiation: CMP-8 supports the action on this proposal. CMP-8 Accepted Proposal 8-127 which revised 366.23(A) to state: “Adjustment Factors”.

This comment has been balloted through CMP-8 with the following ballot results:

12 Eligible to Vote
12 Affirmative

70-187
Mr. R. Loyd voted affirmatively stating: “Proposal 6-52 was to Accept. The word “adjustment” should be changed in two places.”

Panel Meeting Action: Accept in Principle

In FPN No. 2, change “correction factor” to “adjustment factor” in both places and change 376.22 to 376.22(B).

Panel Statement: The panel agrees with the affirmative comment by R. Loyd that the change of the term from “correction” to “adjustment” applies in both places in FPN. No. 2. The panel action correlates with the Panel 8 action to accept in principle Proposal 8-157 to change “derating factors” to “adjustment factors” in 376.22(B).

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-59 Log #262 NEC-P06

Final Action: Reject

(Table 310.15(B)(2)(a) Exception No. 6 (New) )

Submitter: Stanley J. Folz, Morse Electric, Inc.

Recommendation: Text should remain as originally submitted.

Substantiation: Please indicate what testing the Panel is referring to that takes into account the light loads encountered in a dwelling.

Panel Meeting Action: Reject

Panel Statement: The information came from the Copper Development Association and was available for public comment in the 2005 Code cycle.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Abstain: 1

Explanation of Abstention:

HUDDELESTON, JR., R.: This Code Panel member believes that it is rather flippant for the Panel to disregard the submitter’s request for documentation for evidence, as reported in the Panel Statement made after the Proposal was submitted to allow an exception for de-rating in a dwelling unit. If the Panel wishes to base its decisions on evidence, then that evidence should be available to the public and to those who submit Proposals and Comments to the Panel. If the evidence does not exist or is faulty, then the Panel should reconsider its actions. However, simply stating that the evidence was available 3 years ago is not the kind of response that a Panel member should provide. This Panel hopes that the submitter was not unduly insulted by this answer.

6-60 Log #343 NEC-P06

Final Action: Reject

(Table 310.15(B)(2)(c) )

Submitter: Joel Nelms, R & J Electric LLC

Comment on Proposal No: 6-51

Recommendation: Proposal 6-51 should have been rejected.

Substantiation: The implications to users of conduit/wire systems of this proposal are oppressive. A derating to 33 percent of Table 310.16 ampacity for conductors run in conduits across roofs is completely unwarranted and is just a ploy to generate revenue for manufacturers. In the 32 years of industrial experience that I personally have, I have not known of a single documented failure of conductors run in conduits across roofs that could be attributed to overheating. Existing derating according to ambient temperatures more than compensates for ampacity adjustments needed.

This proposal does not address any real problem - only one that was perceived and dreamed up by those who would benefit from the use of larger copper for installations. Maybe if the Code Panel committees were made up of fewer representatives from manufacturers and more representation from people who actually worked in the electrical field, the Code would serve the purpose for which it was intended.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 6-48.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

HUDDELESTON, JR., R.: See My Explanation of Negative on Comment 6-38.

MCCLUNG, L.: See My Explanation of Negative on Comment 6-38.

WALL, C.: See my statement on Comment 6-45

Comment on Affirmative:

CLINE, S.: See my affirmative comment on Comment 6-38.

6-61 Log #57 NEC-P06

Final Action: Accept

(Table 310.15(B)(6) )

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 9-7e

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 6 for action. This action will be considered by Code-Making Panel 6 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 6-63.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-62 Log #1072 NEC-P06

Final Action: Accept in Principle

(Table 310.15(B)(6) )

Submitter: David Shapiro, Safety First Electrical Consulting & Safety Education

Comment on Proposal No: 6-61

Recommendation: Replace “…lighting and appliance branch circuit panelboard...” with “branch circuit distribution panelboard.”

Substantiation: The term, “…lighting and appliance branch circuit panelboard…” has been eliminated for 2008, and the proposed substitution uses commonly understood language.

Panel Meeting Action: Accept in Principle

See the panel action and statement on Comment 6-63.

Panel Statement: See the panel actions and statements on Comment 6-63.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-63 Log #1915 NEC-P06

Final Action: Accept

(Table 310.15(B)(6) )

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 6-61

Recommendation: Revise the second sentence to read: “For application of this section, the main power feeder shall be the feeder between the main disconnect and the lighting and appliance branch circuit panelboard that supplies, either by branch circuits, or by feeders, or both, all loads that are part or associated with the dwelling unit.”

Substantiation: The submitter wishes to express his sincere appreciation to CMP 6 for their panel statement. It is a perfectly worded statement of intent, one that the submitter has been pursuing for the last six cycles or so. This comment attempts to make the text of the rule convey the objectives of the statement. The wording clarifies that the dwelling could have a subpanel, as long as it is fed from the main panel so that the load diversity of the subpanel loads is included within the load profile of the main feeder. The comment wording also includes associated loads, as would be the case where there was a detached garage. Finally, the comment deletes the terminology “lighting and appliance branch-circuit” because CMP 9 is removing this from Article 408 (Proposal 9-117).

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-64 Log #1170 NEC-P06

Final Action: Reject

(Table 310.63 )


Comment on Proposal No: 6-68

Recommendation: Accept Proposal 6-68.

Substantiation: Accepting this proposal will correlate with Edison Electric Institute’s companion comments on Proposals 6-15 and 6-19. Code-Making Panel 6 lacks consideration to the fact that nonshielded cables have been used safely for decades. The Edison Electric Institute supports efforts to bring this change about. It may be more acceptable to CMP-6 to allow use up to 5,000 volts rather than 8,000 volts as 4.16kV and 4.8kV applications are more prevalent.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms the panel action and statement on Proposal 6-68.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

HUDDELESTON, JR., R.: See My Explanation of Negative on Comment 6-6.

MCCLUNG, L.: The Panel Statement in Comments; 6-10, 6-11, 6-12, 6-13, 6-14, 6-15, 6-16, 6-17, 6-18, 6-19, 6-20, 6-21, 6-22, 6-23, 6-24, 6-25, and 6-26; “The potential hazard that arises by using non-shielded cable above 2.4 kV installations”; is erroneous, misleading and a distortion of the facts. In no way does it justify deletion of the usage of non-shielded 5 kV from the Code. 5 kV
non-shielded cable used above 2.4 kV (i.e., 3.3 kV, 4.16 kV, etc.), properly specified with the correct insulation wall thicknesses and a non tracking type jacket with or without an overall metallic sheath or armor, properly installed and terminated by a qualified individual, is equally as safe as medium voltage shielded cable. As one of the “user” representatives, IEEE needs to identify the necessity for major industrial/commercial entities to continue to have available the 5 kV non-shielded cables for wiring medium voltage motors and other medium voltage equipment where equipment manufacturer’s (NEMA members) traditionally have not included adequate space for shielded cable terminations. (NOTE: This usage applies to both installed and new equipment).

Rather than penalizing the user of this type of cable, the Panel should work with the users to establish the necessary rules to assure proper application similar to that which the Technical Correlating Committee recommended for the 5000 volt non-shielded cable for airfield series lighting when installed in accordance with the FAA Advisory Circulars (ACs).

WALL, C.: See my statement on Comment 6-12

CLINE, S.: See my affirmative comment on Comment 6-6.

CLINE, S.: See my affirmative comment on Comment 6-6.

H UDDESTON, JR., R.: See My Explanation of Negative on Comment 6-6.

MCCLUNG, L.: See My Explanation of Negative on Comment 6-64.

WALL, C.: See my statement on Comment 6-12

Comment on Affirmative:

CLINE, S.: See my affirmative comment on Comment 6-6.

ZIMNOCH, J.: See my affirmative comment on Comment 6-6.

9-6 Log #1074 NEC-P09
Final Action: Reject

(312.4)

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 9-10

Recommendation: Revise text to read as follows:

"Revise text to read as follows: Repairing Plastic and Drywall and Plasterboard Noncombustible Surfaces."

Substantiation:

I agree with Mr. Holt that all surfaces warrant repair, for reasons of workmanship. I agree with the CMP that inspectors can cite 110.12 to reject unusually shoddy workmanship, so long as the shoddiness is not merely a matter of appearance, in which case such citation would be inconsistent with 90.1(A). Rather, the element of workmanship involved is to close the wall. Almost any barrier will impede the spread of fire a bit, according to a firestopping expert’s presentation to our IAEI chapter. A cover plate manufacturer warned me explicitly, though, that because a cover plate does not sit flat against a wall and box, but usually touches only at the lines where the wall meets the plate’s edges, the entire space under a cover plate is part of the enclosure. This would include any opening in wood paneling, for example. Hence, it is not accurate to say that openings in combustible surfaces do not present the same problem as other surfaces merely because enclosure installed in such surfaces must be brought flush.

However, for a start, let’s at least add cement, tile, Durock, and similar walls, the first having been mentioned by the Panel’s Statement. Firewalls are less effective when breached. While “repair” is not the same as true restoration, it must be better than leaving gaps.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Dr. Paul Hamer, Chevron Energy Technology Company

Comment on Proposal No: 6-68

Recommendation: Proposal 6-68 should be accepted in principle, in line with Mr. McClung’s Explanation of Negative.

Substantiation:

When conductors are enclosed in an overall metallic sheath, armor or conduit, there is no shock hazard since the conductors’ electric field is confined to within the metallic sheath, armor, or conduit. The Panel Statement for rejection of this Proposal (by referring back to the 2005 Code cycle) does not respect the NFPA Regulations Governing Committee Projects 4-3.5.1, which states “…Such statement shall be sufficiently detailed so as to convey the TC’s rationale for its action so that rebuttal may, if desired, be submitted during the Comment period…” The Panel must provide reasonable rationale if the Panel Action on the original Proposal is other than “accept.” It has not fulfilled this obligation in the ROP.
will be no gaps or open spaces greater than 3 mm (1/8 in.) at the edge of the cabinet or cutout box employing a flush-type cover.

Substantiation:
Recommend that this proposal be reconsidered to be accepted. This would be a sound installation practice seeing that not all installations are in drywall or plasterboard no matter if the installation requires a fire rating or not. This proposal should be revisited during the comment stage for consideration to accept.

Panel Meeting Action: Reject

Panel Statement: There is no necessarily a safety issue if some gap remains, particularly where the box extends to the surface as in combustible finishes. The present requirements are sufficient. There has been no test data or loss experience presented to demonstrate the existence of a problem.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-9 Log #1484 NEC-P09
Final Action: Accept in Principle

(314.4)

ARTICLE 314 — OUTLET, DEVICE, PULL, AND JUNCTION BOXES; CONDUIT BODIES; FITTINGS; AND MANHOLES

9-9 Log #1484 NEC-P09
Final Action: Accept in Principle in Part

(314.4)

ARTICLE 250 — WIRING METHODS; ELECTRICAL AND ELECTRONIC EQUIPMENT

9-10 Log #1237 NEC-P09
Final Action: Accept

(314.4 and 314.30(D))

TCC Action: The Technical Correlating Committee understands that the panel action on this comment modifies 314.30(D) only and 314.4 as modified by the panel action on Comment 9-9.

Substantiation:

The changes proposed in 314.30(D) to identify the appropriate rules in Article 250 that apply to bonding metal handhole covers depends upon whether the conductors in the handhole are service conductors or are feeder or branch circuit conductors. The purpose is to connect all exposed conductive surfaces together for electrical continuity as required in 250.92(A) if the conductors in the handhole are feeder or branch-circuit conductors.

Substantiation:
Changes are proposed in 314.30(D) to identify the appropriate rules in Article 250 that apply to bonding metal handhole covers depending upon whether the conductors in the handhole are service conductors or are feeder or branch circuit conductors. The proposition is to connect all exposed conductive surfaces together for electrical continuity as required in 250.92(A) if the conductors in the handhole are feeder or branch-circuit conductors.

Report on Comments A2007 — Copyright, NFPA NFPA 70

70-190
9-12 Log #963 NEC-P09

Final Action: Accept

(314.16)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.

Comment on Proposal No: 9-26

Recommendation: Revise as follows:

314.16 Number of Conductors in Outlet, Device, and Junction Boxes, and Conduit Bodies. Boxes and conduit bodies, shall be of sufficient size to provide free space for all enclosed conductors. In no case shall the volume of the box, as calculated in 314.16(A), be less than the fill calculation as calculated in 314.16(B). The minimum volume for conduit bodies shall be calculated in 314.16(C). The provisions of this section shall not apply to terminal housings supplied with motors or generators.

FNP: For volume requirements of motor or generator terminal housings, see 430.12.

Boxes and conduit bodies enclosing conductors 4 AWG or larger shall also comply with the provisions of 314.28.

Substantiation: Added the existing last line in 2005 text that was inadvertently left off in the proposed action.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-13 Log #1239 NEC-P09

Final Action: Reject

(314.16(B)(1))

Submitter: Rhett Roe, JATC #26 IBEW/NECA

Comment on Proposal No: 9-29

Recommendation: Revise text to read as follows:

314.16(B)(1) Conductor Fill. Each conductor that originates outside the box and terminates or splices within the box shall be counted once, and each conductor that passes through the box without splice or termination shall be counted once. Each loop or coil of unbroken conductor not less than twice the minimum length required for free conductor in 300.14 shall be counted twice. The conductor fill shall be calculated using Table 314.16(B). A conductor, no part of which leaves the box, shall not be counted once.

Substantiation: Comment for the affirmative. Without a conductor length the Code section has no merit or substance.

Panel Meeting Action: Reject

Panel Statement: The removal of the reference to the length would make the requirement subjective and therefore difficult to enforce. In addition there was no substantiation given to support the change in the requirement for the conductors that do not leave the box. The Code provides very specific length provisions in 300.14. In addition, the comment would require pigtail jumpers to devices to be counted in wire fill, which would be a major change without substantiation. The action on Proposal 9-29 stands.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-14 Log #58 NEC-P09

Final Action: Accept

(314.16(B)(4))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 9-31

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel action on this Proposal by replacing text that is vague and unclear, such as “precedes” and “judges”. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

See panel action on Comment 9-16.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-15 Log #962 NEC-P09

Final Action: Reject

(314.16(B)(4))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.

Comment on Proposal No: 9-31

Recommendation: Revise as follows:

314.16 Number of Conductors in Outlet, Device, and Junction Boxes, and Conduit Bodies. As calculated in 314.16(A), be less than the fill calculation as calculated in 314.16(B). The minimum volume for conduit bodies shall be calculated in 314.16(C). The provisions of this section shall not apply to terminal housings supplied with motors or generators.

FNP: For volume requirements of motor or generator terminal housings, see 430.12.

Boxes and conduit bodies enclosing conductors 4 AWG or larger shall also comply with the provisions of 314.28.

Substantiation: The removal of the reference to the length would make the requirement subjective and therefore difficult to enforce. In addition there was no substantiation given to support the change in the requirement for the boxes and conduit bodies, as calculated in 314.16(C). The provisions of this section shall not apply to terminal housings supplied with motors or generators.

Panel Meeting Action: Reject

Panel Statement: CMP 9 believes the concept in the proposal is valid and has changed the text to meet the objections raised in this comment and also by the TCC. Refer to the action on Comment 9-16.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-17 Log #2170 NEC-P09

Final Action: Reject

(314.19)

Submitter: Timothy P. McNeive, Thomas & Betts Corporation

Comment on Proposal No: 9-52

Recommendation: Reject the Panel’s action and replace with the following:

314.16(B)(4) Device or Equipment Fill. For each yoke or strap containing one or more devices or equipment, a double volume allowance in accordance with Table 314.16(B) shall be made for each yoke or strap based on the largest conductor connected to the device(s) or equipment supported by that yolk or strap. Devices or equipment greater than 131 cm3 (8 in.3), shall have their volume identified and shall be calculated at 100 percent of their full volume.

314.19 Boxes Enclosing Flush Devices and Other Utilization Equipment. Boxes, including their optional accessories that provide for additional volume capacity, used to enclose flush devices and all or part of other utilization equipment or its live parts, shall be of such a design that the devices and utilization equipment or its live parts will be completely enclosed on the back and sides, and substantial support for the devices and equipment will be provided. Screws for supporting the box shall not be used in attachment of the device or equipment contained therein.

Substantiation: Respect the extensive effort of the task group convened by CMP 9. However, I feel that the resulting proposal goes far beyond the scope of addressing the 2005 NEC proposal 9-34 and the subsequent comment 9-62. This 2008 proposal introduces prescriptive restrictions on specific box designs where legitimate, Code compliant applications still exist. The present requirements in 314.16 and 314.19 have served electrical safety for many years as is acknowledged in the proposal’s substantiation. The concern introduced by Mr. Hagerty in 2005 NEC proposal 9-34 is valid. Although CMP 9 rejected the original proposal and the comment (9-62), clearly the new proposal to the 2008 NEC, and the panel’s action, now reflects a change in the panel’s position. The panel statements in rejecting proposal 9-34 and comment 9-62 during the 2005 cycle, correctly places the responsibility on the equipment manufacturer to instruct the installer as to the minimum box volume and box depth to be used. Of course, this can be accomplished by a box alone or with a box and available accessories such as box extenders, raised covers, etc. So care needs to be taken not to place all of the burden on the box alone. The commenter in 9-62 correctly states that the information provided by the manufacturer must be driven by requirements in the NEC. The original proposal in 9-34 attempts to implement requirements in the NEC that will lead to appropriate installation of such equipment.

My comment focuses on minor amendment of the original proposal in 9-34 and appropriate amendment of 314.19, which I believe fully addresses the safety concern and permits the good code language in 314.16 and 314.19 to continue to serve our safety needs, as it has for so many years. The “standard” 3-box system works because it is a proven one that does not necessarily need the hoops and loops that this proposal suggests. The only box size required is a single box and one yolk or strap as required by 314.16(B)...

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-16 Log #1916 NEC-P09

Final Action: Accept

(314.16(B)(4))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 9-31

Recommendation: Replace the sentence in the proposal with the following:

“A device or utilization equipment wider than a single 50 mm (2 in.) device box as described in Table 314.16(A) shall have double volume allowances provided for each gang required for mounting.”

Substantiation: To address the TCC comment.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-17 Log #2170 NEC-P09

Final Action: Reject

(314.19)
The FPN should not be accepted because numerous standards and referenced installation standards are intentionally general to accommodate the use of FPNs.

Ballot Results:

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-19 Log #1564 NEC-P09 Final Action: Reject

(314.22)

Submitter: Robert A. McCullough, Ocean County Construction Inspection Department

Comment on Proposal No: 9-45

Recommendation: Rewrite panel’s version of the section as follows:

314.22 Surface Extensions. Surface extensions shall be made by mounting and mechanically securing an extension ring over the box. Equipment grounding shall be established with B uglies or equivalent. Where the equipment projects rearward from the mounting plane of the box by more than 25 mm (1 in.), the box shall have a depth not less than that of the equipment plus 6 mm (1/4 in.).

Panel Meeting Action: Reject


Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-19 Log #1564 NEC-P09 Final Action: Reject

(314.22 Exception)

TCC Action: The Technical Correlating Committee understands that this comment applies to Proposal 16-47 rather than Proposal 9-45.

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 9-45

Recommendation: The panel is encouraged to continue to Accept in Principle Proposal 16-45 and continue to Reject the addition of the FPN.

Substantiation: The reasons to continue to Accept in Principle the Proposal and Reject the addition of the FPN are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Reject

Panel Statement: The recommendation deals with Proposal 16-45, which deals with a section not under the purview of Panel 9. The proposal (9-45) is not related to the recommendation or the substantiation contained in comment 9-19. Panel 9 believes that this should have been referred to Panel 16. Panel 9 expresses no opinion on the technical content of this comment.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-20 Log #1414 NEC-P09 Final Action: Accept in Principle

(314.24)

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)

Comment on Proposal No: 9-52

Recommendation: The panel action on Proposal 9-52 should have been Accept in Principle in Part. NEMA recommends revise the text of Proposal 9-52 as follows:

CMP 9 has appropriately addressed the problem with Proposal 9-52. The acceptance of this comment would also result in additional marking requirements by device manufacturers. As noted in the substantiation to proposal 9-52, it was the objective of the task group not to introduce additional product markings. See Panel action and statement on Comment 9-20.

Panel Meeting Action: Reject

Panel Statement: The problem cited in Proposal 934 and Comment 62 of the 2005 code cycle was a lack of sufficient box depth not sufficient box volume as suggested in this comment. CMP-9 has appropriately addressed the problem with Proposal 9-52. The acceptance of this comment would also result in additional marking requirements by device manufacturers. As noted in the substantiation to proposal 9-52, it was the objective of the task group not to introduce additional product markings. See Panel action and statement on Comment 9-20.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
9-24 Log #817 NEC-P09  
9-24 Log #817 NEC-P09  
9-24 Log #820 NEC-P09  
9-24 Log #820 NEC-P09

Submitter: Robert A. McCullough, Ocean County Construction Inspection Department  
Comment on Proposal No: 9-18  
Recommendation: Rewrite section as follows:  
314.25(A) Nonmetallic or Metal Covers and Plates. Nonmetallic or metal covers and plates shall be permitted. Where metal covers or plates are used, they shall comply with the grounding requirements of 250.10.  
FPN: For additional grounding requirements, see 110.42(A) for metal luminaire (fixture) canopies, and 404.12 and 406.5(B) for metal faceplates.

Substantiation: This is a companion comment to one submitted for 314.4 to establish one generic requirement for grounding and bonding as applicable. I don’t believe this would introduce new material as the groundwork has been set by virtue of other related proposals in concept in Proposal 9-18.

Panel Meeting Action: Reject  

Number Eligible to Vote: 11  
Ballot Results: Affirmative: 11

9-22 Log #472 NEC-P09  
9-22 Log #472 NEC-P09

Submitter: Dan Leaf, Seneca, SC  
Comment on Proposal No: 9-60  
Recommendation: Reject proposal.

Substantiation: The explanations of Negative Votes by panel members is valid. Code rules should not be based on speculation of what might be.

Panel Meeting Action: Accept  
Panel Statement:  
Number Eligible to Vote: 11  
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:  
BELISLE, R.: See my explanation of negative vote on Comment 9-22.

RUPP, B.: See my explanation of negative vote on Comment 9-28.

SZENDRE, M.: See my explanation of negative vote on Comment 9-22.

9-25 Log #908 NEC-P09  
9-25 Log #908 NEC-P09

Comment on Proposal No: 9-60  
Recommendation: Delete the following text:  
Where two or more separately switched, ungrounded conductors are provided to a ceiling mounted outlet box, the outlet box or outlet box system shall be listed for sole support of a ceiling-suspended (paddle) fan. [ROP 9-60]

Substantiation: This entire wording should be deleted. There are too many areas where it is not practical (i.e., bathrooms, hallways, closets, etc.)

Panel Meeting Action: Accept  
Number Eligible to Vote: 11  
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:  
BELISLE, R.: See my explanation of negative vote on Comment 9-22.

RUPP, B.: See my explanation of negative vote on Comment 9-28.

SZENDRE, M.: See my explanation of negative vote on Comment 9-22.

9-26 Log #942 NEC-P09  
9-26 Log #942 NEC-P09

Submitter: Robert G. Fahey, City of Evansville  
Comment on Proposal No: 9-60  
Recommendation: Revise text to read as follows:  
(D) Boxes at Ceiling-Suspended (Paddle) Fan Outlets. Outlet boxes or outlet box systems used as the sole support of a ceiling-suspended (paddle) fan shall be listed, shall be marked by their manufacturer as suitable for this purpose, and shall not support ceiling-suspended (paddle) fans that weight more than 32 kg (70 lb). For outlet boxes or outlet box systems designed to support ceiling-suspended (paddle) fans that weight more than 16 kg (35 lb), the required marking shall include the maximum weight to be supported. In a dwelling unit, a ceiling outlet box installed for use as a lighting fixture outlet in a habitable room, such as a bedroom, living room, dining room, recreation room or kitchen and located where a ceiling fan could be installed shall be a type listed for ceiling fan support.

Substantiation: The proposed wording will not solve the problem with people installing ceiling fans on ceiling outlet boxes in dwelling units where the boxes are not designed for the ceiling fans. There are many ceiling fans with remote controls in which a second ungrounded conductor is not needed to make the
The scenario presented in the proposal therefore amounts to a subterfuge.

BELISLE, R.: See my explanation of negative vote on Comment 9-22.

construction, the ceiling will be (as in an unfinished attic) and there will be an electrician knows that although the wall will not be accessible after running multiple switched conductors to ceiling boxes. The practice being widespread seems remote. Although wiring such ceiling boxes risk to those who would perpetrate such a practice that the likelihood of this fan boxes present such little marginal cost in comparison to the significant fan boxes installed for special fixtures. To take away a person’s choice and dictate a very questionable assertion of a likely outcome. UL 507 requires clearly (314.27(D))

Substantiation: (314.27(D))

Submitter: Gilbert L. Thompson, MEIA Codes and Standards

Comment on Proposal No: 9-60

Recommendation: The Panel should reconsider their action and delete the new language for part (D) and reject the proposal not accept it. The inspector’s association agrees with the negative comments of Mr. Hartwell, Mr. LeMay and especially Mr. McCullough that the proposal should be rejected. The submittal has not provided any data to support such a drastic change. It also appears that this seems to be an industry recommendation for their own special interests.

Substantiation: For safety’s sake, UL is already requiring warning labels and instructions on how to install paddle fans. To require that every ceiling box that’s installed so it accommodates fans could cause expenses and wiring problems. As an example, some fans, halogen, clothes closet, bathroom and soffits (the ceiling types) contain two switch legs - one for the light, some for fans, outside lights, sconce lights, multiple control of fixtures, etc. and will never have paddle fans attached as there is not enough room or the boxes were installed for special fixtures. To take away a person’s choice and dictate as to how they wire, goes against good reasoning. The present wording in this section takes safety and consideration while allowing flexibility in the wiring design.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3


What stands between today and tomorrow is qualified, disinterested third-party inspection. If some jurisdictions are seeing the instances described in the proposal substantiation, it certainly could be because these jurisdictions have failed to create a regulatory environment that supports such inspections. This was the importance of the “Inspection Initiative” in the 1990s. Without inspection (and also without product standards) the NEC becomes invalid on its face, and our electrical safety system unravels. Rules based on a presumption of the absence of inspection create a completely misleading sense of security.

Panel Meeting Action: Accept

9-27 Log #1045 NEC-P09

Final Action: Accept (314.27(D))

Submitter: James W. Carpenter, International Association of Electrical Inspectors

Comment on Proposal No: 9-60

Recommendation: The Proposal should be Rejected.

Substantiation: Electrical inspectors should not be put in the position of enforcing requirements motivated by an assumption of future actions on the part of an owner. There was no fact-finding work to support the proposal, only a very questionable assertion of a likely outcome. UL 507 requires clearly visible markings on the outside of the carton for ceiling-suspended (paddle) fans as well as statements in the installation instructions regarding proper support for these fans.

The scenario presented in the proposal therefore amounts to a subterfuge. If the new owners are aware that they will be installing paddle fans on substandard boxes, then it is a conspiracy and the NEC cannot be written in such a way as for achieving such effects. If the new owners are now aware of the rules, and if the builders tell them that a fan with conventional mounting arrangements is an option, then such owners are the victims of a fraud. Listed fan boxes present such little marginal cost in comparison to the significant risk to those who would perpetrate such a practice that the likelihood of this practice being identified on a remote fan. Although wiring such ceiling boxes for future use fan use is noted from time to time, the usual condition is to supply fan boxes in those cases. Furthermore there are other legitimate reasons for running multiple switched conductors to ceiling boxes.

Many remodelled or remodeled with one set of lamps controlled independently from the remaining lamps. Many ceilings are wired with multi-circuit lighting track for which such switching arrangements are required. An additional switched conductor may be run to an overhead outlet box because the electrician knows that although the wall will not be accessible after construction, the ceiling will be (as in an unfinished attic) and there will be an additional light provided for accent lighting. Some wiring layouts, even at the time of the rough inspection, have an additional switched conductor entering a ceiling box and then extended to a switched receptacle or second lighting outlet in the same room.

In addition, fan boxes are not and never have been the only acceptable method of hanging a paddle fan. They are only required when the box is the sole support of the fan. One major paddle fan manufacturer is now producing an enormous volume of paddle fans (sold through major home supply channels) that come complete with installation directions that do not recognize fan box support, and that instead call for direct support of the fan bracket using long screws that extend through the standard mounting hole pattern of steel boxes and into framing above the box.

The proposal applies to any ceiling outlet box, even one too close to a wall to be used for a paddle fan, or even one in a commercial or industrial occupancy for which no conceivable paddle fan use would be likely. In addition, there are many applications for which no fan box is now and ever would be likely available. For example, there are no plaster rings now listed for fan support, because of the obvious difficulties involved in attempting to cover all possible combinations in a testing laboratory. The inspection community should never be forced to routinely apply 90.4 (which requires special permission) for all these legitimate applications, both residential and nonresidential.

The proposal violates the fundamental principles of the scope of the NEC in 90.1. A ceiling outlet box wired as described in the proposal is entirely safe until and unless a paddle fan is mounted in such a way that the box is the sole support of the fan. And 90.1(B) clearly tells us that NEC compliant installations today may not be suitable for future uses tomorrow.

What stands between today and tomorrow is qualified, disinterested third-party inspection. If some jurisdictions are seeing the instances described in the proposal substantiation, it certainly could be because these jurisdictions have failed to create a regulatory environment that supports such inspections. This was the importance of the “Inspection Initiative” in the 1990s. Without inspection (and also without product standards) the NEC becomes invalid on its face, and our electrical safety system unravels. Rules based on a presumption of the absence of inspection create a completely misleading sense of security.

Panel Meeting Action: Accept

9-28 Log #1210 NEC-P09

Final Action: Accept (314.27(D))

Submitter: Joseph A. Hertel, Safety and Buildings

Comment on Proposal No: 9-60

Recommendation: Revise the proposed accepted text to read: (D) In a dwelling unit, a ceiling outlet box installed for use as a lighting fixture outlet in a habitable room or kitchen and located where a ceiling fan could be installed shall be a type listed for ceiling fan support.

Substantiation: I can agree with the recommendation for fan boxes. The State of Wisconsin has had this requirement for several cycles and found that it eliminates the actual or perceived problems with ceiling paddle fan installation. The proposed language would apply to all facilities. The problem with homeowners doing the work in dwellings, and commercial installations have not proven to be a problem.

Panel Meeting Action: Reject

Panel Statement: The Comment introduces text that is unenforceable and does not comply with the Style Manual (e.g., the use of “could”). The Panel has addressed this subject for multiple code cycles and has consistently determined that the requirement for fan boxes in ceiling outlets for the support of luminaries in all or most habitable rooms is excessive.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Final Action: Accept

9-30 Log #1917 NEC-P09

Final Action: Accept (314.27(D))

Submitter: Frederic P Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 9-60

Recommendation: Reject the proposal.

Substantiation: I made most of my arguments in the explanation of negative vote attached to the proposal. However, in those comments, I expressed a willingness to entertain other approaches to the problem, such as actual notice
on the panelboard. I now believe that the proposal should not be accepted in any form, based on actual experience in the late spring. I was replacing a paddle fan (hung under the 1978 NEC on a conventional box) with a modern (Ha*** *) well-known brand with extensive market penetration, especially through home stores. While purchasing the fan, I picked up a fan box, certain that I would need it. To my amazement, the installation directions did not call for a fan box, but instead mandated a timber support across the back of a conventional outlet box. The fan came with screws designed to pass through the fan bracket and line up with the box support hole drillings, and long enough to securely connect the wood to the ceiling box. I’ve replaced the ceiling box with a fan rated box. I do not think this is either fraud or a conspiracy, and revised as follows:

Recommendation:

Panels Meeting Action: Accept
Number Eligible to Vote: 11
Balleetats: Affirmative: 8 Negative: 3
Explanation of Negative:
BELISLE, R.: See my explanation of negative vote on Comment 9-22.
RUPP, B.: See my explanation of negative vote on Comment 9-28.
SZENDRE, M.: See my explanation of negative vote on Comment 9-22.

9-31 Log #1972 NEC-P09
Final Action: Accept
(314.27(D))

Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 9-60
Recommendation: This Proposal should have been Rejected.
Substantiation: This is an extreme example of “what-if” code. The presumption that there are two or more separately switched conductors in a box the box will be used for a fan is totally unsupported by any evidence. In fact, in installations like this, the extra conductors are often just that - extra conductors - and no switches are installed, so the conductors are not “separately switched” until the user decides to add the extra switches. That makes the rule difficult to enforce.

Furthermore, many fans available today do not even need the additional wire, as special switches are available that allow the single switched conductor to be used to control the fan, the fan speed, and even the intensity of the lights. Many other fans are supplied with wireless remote controls so that no special wiring is required. If, so the panel is really concerned about the possibility that a fan will be installed in the future, they must also assume that the people installing such fans will disregard all the instructions, and since a fan could be installed in any ceiling box with or without special wiring, the panel should just require all ceiling boxes to be suitable for fan support. In fact, how do we know someone won’t take out the smoke alarm and use that for a fan? The 3 comments on negative should get additional consideration by the panel.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
BELISLE, R.: See my explanation of negative vote on Comment 9-22.
RUPP, B.: See my explanation of negative vote on Comment 9-28.
SZENDRE, M.: See my explanation of negative vote on Comment 9-22.

9-32 Log #2156 NEC-P09
Final Action: Reject
(314.27(D))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 9-60
Recommendation: Proposal 2-197 should continue to be “Accept in Principle” and revised as follows:

Where two or more separate switched, ungrounded conductors are provided to a ceiling mounted outlet box, in single or multi-family dwellings, the outlet box or outlet box system shall be listed for sole support of a ceiling-supported (paddle) fan.

Substantiation: The revised language limits this requirement to single or multi-family dwellings. The practices of supplying a ceiling box with two switches is a common practice in new construction. For example: A standard ceiling box listed for luminaires is used when a ceiling fan is not supplied by the builder in a bedroom. Two switches are wired to the box. One of the switches is connected to the ceiling fan and the other switch is connected to the luminaire, the ceiling fan is powered by the luminaire, as in the outlet boxes. The new homeowner decides over a period time to replace the luminaire with a ceiling fan with a light kit and connect both switches. The homeowner is unaware of the required markings for a ceiling fan box and mounts the ceiling fan to the standard ceiling box. The ceiling fan assembly is located over the bed of a child.

I know this is a fact because it occurred in my current house. Fortunately, I am educated in the proper markings of ceiling boxes and did replace the ceiling box with a fan rated box. I do not think this is either fraud or a conspiracy, but builders taking advantage of the current code language. No where in the current NEC does it require a ceiling box rated for ceiling fan support when a fan is not installed. Since a fan was not supplied by the builder they were not obligated nor required to install a fan rated ceiling box. The proposed text fixes this.

Also, it is acceptable for a chandelier and other “multiple reasons” to be supported by a box listed for ceiling fan support. Ceiling fan boxes are also required to be tested and listed for luminaire support per UL 514A and UL 514C. This proposal addresses a safety issue to protect innocent homeowners from injury, fire or shock.

Panel Meeting Action: Reject
Panel Statement: CMP 9 has reconsidered the overall merits of this proposal, and decided to reject it based on the reasoning presented in Comments 9-22, 9-25, 9-27, 9-28, 9-30, and 9-31.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
BELISLE, R.: See my explanation of negative vote on Comment 9-22.
RUPP, B.: See my explanation of negative vote on Comment 9-28.
SZENDRE, M.: See my explanation of negative vote on Comment 9-22.

9-33 Log #268 NEC-P09
Final Action: Hold
(314.27(D) Exception (New ))

Submitter: Alan Halbert, EE Products Inc.
Comment on Proposal No: 2-265
Recommendation: Add a new exception to read:

314.27(D) Boxes at Ceiling-Suspended (Paddle) Fan Outlets. Outlet boxes or outlet box systems used as the sole support of a ceiling suspended (paddle) fan shall be listed, be marked by their manufacturers as suitable for this purpose, and shall not support ceiling-suspended (paddle) fans that weigh more than 32 kg (70 lb). For outlet boxes or outlet box systems designed to support ceiling-suspended (paddle) fans that weigh more than 16 kg (35 lb), the required marking shall include the maximum weight to be supported.

Exception: For outlet box systems that are not subject to national testing standards and install through the interior of the outlet box, the system shall not be required to be listed.

Substantiation: This substantiation for this comment is provided in the abstract received by NFPA as supporting Material.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Hold
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-34 Log #59 NEC-P09
Final Action: Accept
(314.27(E) (New ))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 9-63
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal by replacing text that is vague and unclear, such as “comparable size and weight”. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: See the action on Comment 9-35, which responds to the concerns in this comment.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-35 Log #1918 NEC-P09
Final Action: Accept
(314.27(E) (New ))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-63
Recommendation: Revise the action text to read as follows: E. Utilization Equipment. Boxes used for the support of utilization equipment other than ceiling-suspended (paddle) fans shall meet the requirements of 314.27(A) and (B) for the support of a luminaire (fixture) that is the same size and weight.

Exception: Utilization equipment weighing not more than 3 kg (6 lb) shall be permitted to be supported on other boxes or plaster rings that are secured to other boxes, provided the equipment or its supporting yoke is secured to the box with no fewer than two No. 6 or larger screws.
9-36 Log #961 NEC-P09 Final Action: Reject (314.28(A)(2))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 9-67
Recommendation: Add a comma after “Angle” and delete the extra “or” in the title as follows:

314.28 Pull and Junction Boxes and Conduit Bodies
(A) Minimum Size.
(2) Angle, or U Pulls, or Splices. Where splices or where angle or U pulls are made, the distance between each raceway entry inside the box and the opposite wall of the box shall not be less than six times the metric designator (trade size) of the largest raceway in a row. This distance shall be increased for additional entries by the amount of the sum of the diameters of all other raceway entries in the same row on the same wall of the box. Each row shall be calculated individually, and the single row that provides the maximum distance shall be used.

Substantiation: Added a comma and deleted an extra “or” for grammatical reasons in the title of the rewritten text.

Panel Meeting Action: Reconsider
Panel Statement: The title is grammatically correct. The rule covers both angle and U pulls (principal application). These are related and should be grouped. The rule, coincidentally, covers the spacing requirements for spliced conductors, which is an additional application.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-37 Log #1566 NEC-P09 Final Action: Reject (314.28(C))

Submitter: Robert A. McCullough, Ocean County Construction Inspection Department
Comment on Proposal No: 9-18
Recommendation: Delete text as follows:

Where used, metal covers shall comply with the grounding requirements of 250.110.

Substantiation: This is a companion comment to one submitted for 314.4 to establish one generic requirement for grounding and bonding as applicable. I don’t believe this would introduce new material as the groundwork has been set by virtue of other related proposals in concept in Proposal 9-18.

Panel Meeting Action: Reject
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-38 Log #960 NEC-P09 Final Action: Accept in Principle (314.30)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 9-71
Recommendation: Revise as follows:

314.30 Handhole Enclosures.
Handhole enclosures shall be identified for use in underground systems. and Handhole enclosures shall also be designed and installed to withstand all loads likely to be imposed on them.

FPN: See ANSI/SCTE 77-2002, Specification for Underground Enclosure Integrity, for additional information on deliberate and non-deliberate traffic loading that can be expected to bear on underground enclosures.

Substantiation: This has been restructured into two separate sentences to make more grammatical sense and a hyphen has been inserted into “non-deliberate” in the FPN.

Panel Meeting Action: Accept in Principle
Panel Statement: CMP 9 agrees with the concept of restating the rule using two sentences, but prefers to lead the rule with the more general provision.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-39 Log #275 NEC-P09 Final Action: Reject (314.30(C))

Submitter: Dennis Downer, Morrisville, VT
Comment on Proposal No: 9-72
Recommendation: Revise text to read as follows:

314.30 Handhole Enclosures.
(C) Handhole Enclosures Without Bottoms. Where handhole enclosures without bottoms are installed, all enclosed cables, conductors and any splices or terminations, if present, shall be listed as suitable for wet locations.

Substantiation: Where handhole enclosures are installed, what difference does it make if the enclosure has a bottom or not, the box has the possibility of having water enter the enclosure, the enclosed conductors, cables and any splices or terminations, if present, shall be listed as suitable for wet locations. Also, the word Cables should be added to make it consistent with 300.5(B).

Panel Meeting Action: Reject
Panel Statement: As noted in the panel statement on the underlying proposal, the panel action on Proposal 9-77 accomplishes the technical objectives of this comment which merely restates that proposal verbatim. The wet location rule will now apply to all conductors and splices within handhole enclosures regardless of whether they enter as cable assemblies or from raceways. The comment presents no substantiation to support changing the CMP 9 actions on this subject.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-40 Log #1567 NEC-P09 Final Action: Reject (314.30(D))

Submitter: Robert A. McCullough, Ocean County Construction Inspection Department
Comment on Proposal No: 9-18
Recommendation: Delete text as follows:

Delete the last sentence: Metal covers and other exposed conductive surfaces shall be bonded in accordance with 250.96(A).

Substantiation: This is a companion comment to one submitted for 314.4 to establish one generic requirement for grounding and bonding as applicable. I don’t believe this would introduce new material as the groundwork has been set by virtue of other related proposals in concept in Proposal 9-18.

Panel Meeting Action: Reject
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-41 Log #1568 NEC-P09 Final Action: Reject (314.40(D))

Submitter: Robert A. McCullough, Ocean County Construction Inspection Department
Comment on Proposal No: 9-18
Recommendation: Rewrite section as follows:

(D) Grounding and Bonding Provisions. A means shall be provided in each metal box for the connection of an equipment grounding conductor or a bonding jumper. The means shall be permitted to be a tapped hole or equivalent.

Substantiation: This is a companion comment to one submitted for 314.4 to establish one generic requirement for grounding and bonding as applicable. I don’t believe this would introduce new material as the groundwork has been set by virtue of other related proposals in concept in Proposal 9-18.

Panel Meeting Action: Reject
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-42 Log #818 NEC-P09 Final Action: Reject (314.72)

Submitter: Robert A. McCullough, Ocean County Construction Inspection Department
Comment on Proposal No: 9-81
Recommendation: “Accepting in principle” and insert the proposed language into new sections 312.10(D) and 314.40(E).

Substantiation: The CMP stated in their substantiation that sharp edges do create a hazard and provide “legitimate concerns,” but deferred to take action due to inappropriate numbering of the proposal as submitted. The CMP also stated that this is a product standard issue. Product standards are driven by need, request of the consuming public, installers and code experts. The CMP should act on this proposal by “Accepting in principle” and insert the proposed language into new sections 312.10 (D) and 314.40 (E).
These locations would apply to all boxes and enclosures of concern, and meet the intent of the submitter’s request.

Panel Meeting Action: Accept in Principle

1. Add the following new subsection to 312.10, renumbering the present 312.10(B) and 312.10(C) as 312.10(C) and 312.10(D) respectively:

(B) Enclosure Edges. All sharp edges of metal enclosures within the scope of this article that are subject to hand contact during customary installation activity shall, at the time of manufacture, be protected or shall be de-burred and rounded to minimize the risk of injury. This requirement shall take effect January 1, 2011.

2. Add the following new subsection to 314.40, renumbering the present 314.40(D) as 314.40(E):

(D) Enclosure Edges. All sharp edges of metal pull and junction boxes over 1650 cubic in size that are subject to hand (100 in.3) in size that are subject to hand contact during customary installation activity shall, at the time of manufacture, be protected or shall be de-burred and rounded to minimize the risk of injury. This requirement shall take effect January 1, 2011.

Panel Statement: CMP 9 agrees with the Comment and has modified it editorially to locate it with related material covering metal enclosures, and rewording to focus on the likelihood of hand injuries on larger enclosures.

CMP 9 understands that these requirements may compel significant changes in product standards and manufacturing procedures, and has delayed the effective date accordingly.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

OSBORNE, R.: Panel members agree that the concern with sharp edges is one to be addressed by the product standards. This fact is illustrated in the original panel action and panel statement, and the proposed Code language, which indicate that sharp edges shall be protected or de-burred at the time of manufacture. The panel appears to be taking a “back door” approach to address the concern, rather than pursuing changes to the applicable product standards (if needed) and holding manufacturers accountable for products that have edges which are unacceptable. Standard development organizations, such as Underwriters Laboratories, use an open process for revising standards. This process is similar to that used by NFPA to develop the Code. While many standards have requirements to address sharp edges, the opportunity exists for individuals to submit proposed changes to these standards and add or modify requirements as they relate to this issue.

Many certification organizations also have in place a process by which products with identified concerns can be reviewed. This process can be used to determine if the problem should be addressed by new or revised requirements in the standard, or if adequate requirements exist, if the problem is systemic to the industry or specific to a manufacturer. One type of product identified as having concerns with sharp edges is enclosed panelboards. The product standard for panelboards (UL 67) has detailed requirements for sharp edges, including reference to the Standard for Sharpness of Edges on Equipment (UL 1439) and UL has not received complaints of sharp edges and the form of field complaints on these products. Anecdotal evidence is not sufficient to enact change to the product standard and Code. Properly documented field complaints can be used to identify whether a problem is specific to an industry, a manufacturer, a specific factory, or is a perception rather than a reality.

What constitutes a sharp edge is subjective and with any subjective requirement, places the inspector at a disadvantage when applying the requirements. Additionally, the ability of the AHJ to decide on the approval of equipment is already provided in 90.4. Should inspectors conclude that sufficiently sharp edges exist on equipment, they can reject the installation citing 9.4.

It is suggested that panel members refocus their efforts and address this concern in the proper forum rather than introducing requirements which are acknowledged by the authors as being misplaced.

RUPP, B.: NEMA continues to consider this to be a standards issue and this information does not belong in the installation code. Concerned people should contact the manufacturer of a particular type of equipment causing an issue and should actively participate on the technical panels of the product standards to affect changes where necessary.

Comment on Affirmative:

MCCULLOUGH, R.: I believe the Panel’s action to be proactive on this issue is correct and, by placing the revised text in the construction specifications part of Articles 312 and 314, will force changes in the appropriate product standards as well as the manufacturing process. The delay date to allow for these changes should be sufficient. This change needs to occur at these levels rather than be in a rule enforced by the AHJ. Otherwise, there would be no consistency in enforcement. I also believe that as an editorial revision, 314.70(3) should be changed to include this new (D) as well. The same concerns of personal injury are valid for boxes used on systems over 600 volts.

SENGUPTA, S.: Comment: Delete the last sentence: “This requirement shall take effect January 1, 2011.” from 312.10(B) and 314.40(E).

Reason: I agree with the IBEW/NECA’s comment and CMP 9’s recognition of a sharp edge on any metallic box is a safety issue and thus, I strongly recommend CMP 9 to remove the effective date. Let the manufacturers recognize the significance of both the safety issue and the code requirement and take appropriate actions. Any new code requirement always creates various degrees of significance to users, installers and manufacturers; addressing the degree of significance with an extended timeline on one requirement may not help the core issue of safety.

Additionally, removal of the date may also reduce the number of proposals in the 2011 code cycle appealing extension of the date from January 1, 2011 to January 1, 2014 or other future dates, citing this panel statement: “CMP 9 understands that these changes may compel significant changes in product standards and manufacturing procedures, and has delayed the effective date accordingly.

ARTICLE 320 — ARMORED CABLE: TYPE AC

7-1 Log #926 NEC-P07

Affirmative: 332, 333, 334, 340

Final Action: Reject

Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474

Comment on Proposal No: 7-1

Recommendation: We feel that the panel should have rejected this proposal.

Substantiation: We are not confident that the results of this task group represent consensus and justification for the TCC to offer those findings as a TCC proposals for the 2008 NEC.

Panel Meeting Action: Reject

Panel Statement: The comment provides no technical justification for rejecting the proposal, only commentary on the participation in the development of the proposal.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

7-2 Log #1071 NEC-P07

Affirmative: 320, 12(1)

Final Action: Reject

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 7-3

Recommendation: Revise text to read as follows:

Mechanical damage

Substantiation: The NEC Style Manual says in “3.2.5.5 Provisions on Protection Against Physical Damage: If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology.

In this section, the NEC is not requiring the addition of mechanical protection from mechanical damage, but rather it is forbidding the use of AC cable where subject to such damage. This is not what 3.2.5.5 addresses, so it is not clear how the Panel Statement can claim that this use of the term complies with that section of the manual.

Panel Meeting Action: Reject

Panel Statement: Physical damage is the appropriate terminology in accordance with the 2003 NEC Style Manual which states:

3.2.5.4 Provisions on Protection Against Physical Damage. If protection against physical damage is to be one of the requirements, this can be standardized by the use of this terminology instead of using the phrase provided with mechanical protection to mean the same thing.”

Physical Damage is a properly used generic term that directs installers and users of the code to protect wiring methods from the types of damage that could be present in a given environment.

Mechanical Damage is a specific type of “Physical Damage”. Cables are required to be protected from all forms of damage that are likely to be present in a given area, unless approved for the purpose.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14
It should also be noted that much of the construction uses manufactured installation requirements of type AC, MC, and NM cable when installed in accessible attics. The present title of 320.23 is "In Accessible Attics." We should note the installation requirements of type AC, MC, and NM cable when installed in accessible attics.

Panel Meeting Action: Reject
Panel Statement: The word "Physical," is appropriate since it specifically defines the type of protection being provided and complies with 3.2.5.5 of the NEC style manual. The code often times uses a language "all of its own" as its primary focus is on the protection of life and property. "Ampacity" is another word that is specific to the NEC, and like the phrase "physical damage," is very useful to code users. Also see panel statement on Comment 7-2.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

The rules, as they are currently written, are conveniently located within the very limited articles that they apply. There is no substantiation that implies that relocating the rules within the text of 300.4 will enhance code "usability". Article 300 normally contains requirements that apply in general. When a user selects a particular cable type, it is convenient to have all the rules specific to that cable type in the same Article.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 324 — FLAT CONDUCTOR CABLE: TYPE FCC

Panel Meeting Action: Accept
Panel Statement: The panel acted properly on this proposal. Article 324 is a unique wiring method, and should remain isolated from any other wiring methods.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 328 — MEDIUM VOLTAGE CABLE: TYPE MV

Panel Meeting Action: Accept
Panel Statement: The panel acted properly on this proposal. See my Comment on Affirmative Vote on the Proposal.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-7 Log #601 NEC-P07 Final Action: Accept (324.10(H))

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 328 — MEDIUM VOLTAGE CABLE: TYPE MV

Panel Meeting Action: Accept
Panel Statement: The panel acted properly on this proposal. Article 324 is a unique wiring method, and should remain isolated from any other wiring methods.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 328 — MEDIUM VOLTAGE CABLE: TYPE MV

Panel Meeting Action: Accept
Panel Statement: The panel acted properly on this proposal. Article 324 is a unique wiring method, and should remain isolated from any other wiring methods.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 328 — MEDIUM VOLTAGE CABLE: TYPE MV

Panel Meeting Action: Accept
Panel Statement: The panel acted properly on this proposal. Article 324 is a unique wiring method, and should remain isolated from any other wiring methods.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14
Panel Meeting Action: Accept in Principle
Revise 328.10 of the current code as follows:
Renumber (3), (4), and (5) as (4), (5), and (6) respectively
Add (3) "In cable trays, where identified for the use, in accordance with Part II of Article 328.12"

In (5), add the phrase “in accordance with Part II of Article 396” so it reads:
“(5) In messenger-supported wiring in accordance with Part II of Article 396”
In (6), delete the phrase “wiring in locations accessible to qualified persons only” as so it reads: “(6) As exposed runs in accordance with 300.37.”
Revise 328.12 of the current code as follows:
Delete (2) and (3) and revise to read: “(328.12) Uses Not Permitted. Type MV cable shall not be used where exposed to direct sunlight, unless identified for the use.

Panel Statement: Section 328.12(2) was relocated to 328.10(3) and (3) was deleted. Since only (1) remained, the list was deleted and the text included in the first sentence of 328.12.

The Panel Action on Comment 7-12 modifies this Panel Action.

7-10 Log #735 NEC-P07 Final Action: Accept
(328.11)

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 7-21
Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards.

Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP7 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development.

If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-11 Log #849 NEC-P07 Final Action: Accept
(328.11)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 7-21
Recommendation: The panel is encouraged to continue to Reject Proposal 7-2

Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of consulting the original manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

The Panel Accepts in Part the Exception to (5) in 328.10 to immediately follow (6), before the FPN to read:
“Exception: Type MV cable that has an overall metallic sheath or armor, also complies with the requirements for Type MC cable, and is identified as “MV or MC” shall be permitted to be installed as exposed runs of metal-clad cable in accordance with 300.37.”

The Panel accepts in part the second Exception to immediately follow 328.10(3) to read:
“Exception: Type MV cable that has an overall metallic sheath or armor, also complies with the requirements for Type MC cable and is identified as “MV or MC” shall be permitted to be installed in cable trays in accordance with 392.3(A).

Substantiation: These two Exceptions do not introduce new material nor change any existing requirements; they merely clarify what is currently permitted in the Code.

The Panel added the phrase “has an overall metallic sheath or armor” to specifically require an overall armor, compliance with all the conditions under which Type MV cables are permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.” Therefore, the conditions under which Medium Voltage Type MC cables are permitted to be installed in cable tray systems shall be specified in Part II of Article 328.

The substantiation for exposed runs of “MV or MC” cables in the first Exception is that 330.10(A)(4) permits Type MC cable to be installed “exposed or concealed”.

The substantiation for the installation of “MV or MC” cables in cable tray in any location is that 330.10(A)(6) permits Type MC cable to be installed “in cable tray where identified for such use”.

Panel Meeting Action: Accept in Principle
The Panel Accepts in Part the Exception to (5) in 328.10 to immediately follow (6), before the FPN to read:
“Exception: Type MV cable that has an overall metallic sheath or armor, also complies with the requirements for Type MC cable, and is identified as “MV or MC” shall be permitted to be installed as exposed runs of metal-clad cable in accordance with 300.37.”

The Panel accepts in part the second Exception to immediately follow 328.10(3) to read:
“Exception: Type MV cable that has an overall metallic sheath or armor, also complies with the requirements for Type MC cable and is identified as “MV or MC” shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.” Therefore, the conditions under which Medium Voltage Type MC cables are permitted to be installed in cable tray systems shall be specified in Part II of Article 328.

The substantiation for exposed runs of “MV or MC” cables in the first Exception is that 330.10(A)(4) permits Type MC cable to be installed “exposed or concealed”.

The substantiation for the installation of “MV or MC” cables in cable tray in any location is that 330.10(A)(6) permits Type MC cable to be installed “in cable tray where identified for such use”.

Panel Meeting Action: Accept in Principle
The Panel Accepts in Part the Exception to (5) in 328.10 to immediately follow (6), before the FPN to read:
“Exception: Type MV cable that has an overall metallic sheath or armor, also complies with the requirements for Type MC cable, and is identified as “MV or MC” shall be permitted to be installed as exposed runs of metal-clad cable in accordance with 300.37.”

The Panel accepts in part the second Exception to immediately follow 328.10(3) to read:
“Exception: Type MV cable that has an overall metallic sheath or armor, also complies with the requirements for Type MC cable and is identified as “MV or MC” shall be permitted to be installed in cable trays in accordance with 392.10(B) and (C).”

Panel Statement: The Panel added the phrase “has an overall metallic sheath or armor” to specifically require an overall armor, compliance with all the requirements for Type MC cable and not just compliance with the mechanical requirements for MC cable.

Exception to (5) was changed to an Exception under (6) and Exception to (2) was changed to an Exception under (3) to correlate with the Panel Action on Comment 7-9.
The reference in the Exception to (3) was changed from 392.3(B)(2) to 392.10(A) to correlate with the Action on Proposal 7-180 and to provide the correct reference.

Location of the Exceptions immediately following the main rule to which they apply is in accordance with 2.6.1 of the NEC Style Manual. This Panel Action modifies the Panel Action on Comment 7-9.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 330 — METAL-CLAD CABLE: TYPE MC

7-13 Log #928 NEC-P07 Final Action: Reject (330.10(A)(7) (New))

Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-25
Recommendation: The Panel should have accepted this proposal.
Substantiation: This is a safety issue that is directly related to proper grounding. The additional text would prevent ongoing infractions that continue to occur in the field.
Panel Meeting Action: Reject
Panel Statement: Sections 300.10 and 300.15 define the requirements for grounding the metallic armor or sheath.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

LADART, S.: We disagree with the panel action. Proposal 7-25 addresses a grounding issue. The panel is correct in stating that Sections 300.10 and 300.15 define the requirements for grounding the metallic armor or sheath; however, infractions continue to frequently occur in the field. The acceptance of Proposal 7-25 would help eliminate the problem. The new provision (7), to 330.10(a) would give clear guidance to installers that: “when installing MC cable within a raceway, the MC cable must be terminated in a fitting that provides grounding of the metal sheath.” This is a safety issue.

The added prescriptive language could possibly prevent the wrongful practice of leaving the “free end” of MC cable “dangling” within an enclosure as it exits a raceway.

7-14 Log #1096 NEC-P07 Final Action: Accept (330.10(B))

Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 7-26
Recommendation: The Panel Action should continue to be Accept and correct the word “Part” to “Parts”.
Substantiation: Grammatical correction to agree with the text in the 2005 Code and the Preprint of the 2008 Code.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-15 Log #2202 NEC-P07 Final Action: Accept in Principle (330.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-28
Recommendation: Revise text to read as follows:

330.12 Uses Not Permitted

1) Where subject to physical damage.
2) Under the following conditions unless the metallic sheath is suitable for the conditions or is protected by material suitable for the conditions:
   a. For direct burial in the earth
   b. For installation in concrete
   c. Where subject to cinder fills, strong chlorides, caustic alkalis, or vapors of chlorine or of hydrochloric acids.

Substantiation: The above revisions contain no technical changes. The reason for Proposal 7-28 was to clarify that MC is not permitted where subject to physical damage. The text in the 2005 NEC is confusing and is sometimes interpreted to mean that MC cable is allowed where subject to physical damage if the metallic sheath is suitable for the conditions. MC cable is not listed for use where subject to physical damage, regardless of the type of metallic sheath. While the issue in this proposal was to clarify this, it could still be interpreted that MC cable may be used where subject to physical damage if the metallic sheath is suitable for the condition. The revision submitted in this comment makes it very clear that MC cable is not permitted where subject to physical damage.

The 1999 NEC was much clearer about the use of MC cable where exposed to physical damage. Section 334-3 Uses Permitted stated: “Unless specifically prohibited elsewhere in this Code and where not subject to physical damage, Type MC cables shall be permitted as follows.”

When the cable articles were rewritten during the 2002 Code cycle, this requirement became much less clear and has caused confusion in the field.

Panel Meeting Action: Accept in Principle
Revise 330.12 to read as follows:

“330.12 Uses Not Permitted. Type MC cable shall not be used where:
1) subject to physical damage
2) exposed to any of the destructive corrosive conditions in (a) or (b), unless the metallic sheath or armor is resistant to the conditions or is protected by material resistant to the conditions:
   a) direct buried in the earth or embedded in concrete unless identified for direct burial
   b) exposed to cinder fills, strong chlorides, caustic alkalis, or vapors of chlorine or of hydrochloric acids”

Panel Statement: List identification and styles are in accordance with the NEC Style Manual. List item (2) was revised for consistency with the other list items. (a) and (b) were combined into one list item since the identification for direct burial also permits embedment in concrete and (c) was re-identified as (b). A FNQ can only be informative, so it was combined into the rule and, since the Style Manual includes the word “suitable” as being a possibly unenforceable or vague term, it was changed to “resistant”.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-52 Log #946 NEC-P07 Final Action: Reject (330.12)

Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-28
Recommendation: The Panel should have rejected this proposal.
Substantiation: Type MC cable should not be installed where exposed to physical damage. Removing the text from the “uses not permitted” section (330.12(1) is not consistent with other cabling articles.
Panel Meeting Action: Reject
Panel Statement: Proposal 7-28 did not propose the deletion of “subject to physical damage” only its relocation within the section. Also see the panel action and comment on Statement 7-15.

The panel notes that the recommendation was submitted as effecting 338.12 but actually applies to 330.12

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-16 Log #1980 NEC-P07 Final Action: Reject (330.80(B)(1))

Submitter: Robert Konnik, Rockbestos-Surpprenant
Comment on Proposal No: 7-36
Recommendation: Change section 330.80(B)(1) from Table 310.20 to 310.17 as shown below for high temperature MC cables.

(B) Single type MC Conductors Grouped Together. Where single Type MC conductors are grouped together in a triangular or square configuration and installed on a messenger or exposed with a maintained free air space of not less than 2.15 times one conductor diameter (2.15 X OD) of the largest conductor contained within the configuration and adjacent conductor configurations or cables, the ampacity of the conductors shall not exceed the allowable ampicities in the following tables:

1) Table 310.20 for conductors rated 0 to 2000 volts.
   a. Exception: MC cables with silicone rubber insulation may use Table 310.17.

2) Tables 310.67 and 310.68 for conductors rated over 2000 volts.

Substantiation: This would make 330.80(B)(1) the same as 332.80(B) for MI cables and MC cables with high temperature insulation. If the ampacity in Table 310.17 is acceptable for MI cable, it should be acceptable for MC cable. I do not believe it is germane that MI cable insulation may be able to withstand temperatures greater than 90°C, but since the panel believes this is a requirement, I have modified the proposal to be specific to MC cable with silicone rubber insulation since silicone rubber is rated for special applications at 200°C.

Panel Meeting Action: Reject
Panel Statement: Section 310.10 states “No conductor shall be used in such a manner that its operating temperature exceeds that designated for the type of insulated conductor involved.” The explanatory FNQ states “The temperature rating of a conductor [see Table 310.13(A) and Table 310.13(B)] is the maximum temperature, at any location along its length, at which the conductor can withstand over a prolonged time period without serious degradation.”
The standard rating for Type SA is 90°C (194°F) for dry and damp locations. The 200°C (392°F) rating is for special applications such as a high ambient temperature in the vicinity of a heat source, such as a blast furnace, and the ampacity correction factors in Tables 310.20 and 310.17 will correct the allowable ampacity to a lower value where the insulation will not be degraded under normal operating conditions.

When subjected to extremely high ambient temperatures for extended periods of time, the highly compressed refractory mineral insulation in Type MI cable will not suffer degradation.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 14

**ARTICLE 334 — NONMETALLIC-SHEATHED CABLE: TYPES NM, NMC, AND NMS**

7-17 Log #41 NEC-P07
**Final Action:** Accept

**Comment on Proposal No:** 7-42a
**Submitter:** Technical Correlating Committee on National Electrical Code

**Recommendation:** It was the action of the Technical Correlating Committee that further consideration be given to the Affirmative Comment relative to conformance to the NEC Style Manual, as expressed in the voting. This action will be considered by the Panel as a Public Comment.

**Substantiation:** This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

**Panel Meeting Action:** Accept

**Panel Statement:** The panel accepts the direction of the TCC to reconsider. See the panel action on Comments 7-19 and 7-20.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 14

7-18 Log #936 NEC-P07
**Final Action:** Accept

**Comment on Proposal No:** 7-42a
**Submitter:** Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474

**Comment on Proposal No:** 7-42a
**Recommendation:** The panel should have rejected this proposal.

**Substantiation:** The code already clearly indicates that the installation is permissible.

**Panel Meeting Action:** Accept

**Panel Statement:** The code already indicates the installation is permissible.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 14

7-19 Log #1098 NEC-P07
**Final Action:** Reject

**Comment on Proposal No:** 7-42a
**Submitter:** James Daly, Upper Saddle River, NJ

**Comment on Proposal No:** 7-42a
**Recommendation:** The Panel Action should be to Accept in Principle and revise the section to read as follows:

"Relocate (4) to immediately follow (3).

The FPNs should immediately follow (4) and be in the sequence shown and read as follows:

FPN No. 1 to (1), (2), (3), and (4): Types of building construction and occupancy classifications are defined in NFPA 220-1999, Standard on Types of Building Construction, or the applicable building code, or both. See Annex E for a summary of the Types of Construction [NFPA 220, Table 3.1].

FPN No. 2 to (1), (2), (3), and (4): See 310.10 for temperature limitation of conductors.

FPN No. 3 to (2), (3), and 4: NM cable may be installed in any Type of construction in buildings if the building code permits the building to be Type III, IV, or V construction.

**Substantiation:** The revisions proposed do not change any existing requirements; they just further clarify the requirements and enhance usability. The placement of the FPNs provides logical placement of the FPNs and defines the specific list items to which each FPN applies.

FPN No. 2 revised for clarity to agree with the title in Annex E and combined with FPN No. 1 since both FPNs are related to the same information and reference the same NFPA standard.

FPN No. 3 was revised to eliminate the mandatory language to comply with 3.1.3 of the NEC Style Manual.

**Panel Meeting Action:** Reject

**Panel Statement:** The use of NM Cable in dwellings and structures that are permitted to be Type III, IV, or V construction but are constructed to Type I or II requirements is already permitted in 334.10 (2), (3), and (4). If members of the public enter the building, the building can no longer be considered simply a storage occupancy. Additional information is contained in the NFPA Journal, November/December 2004 issue, page 22.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 14

7-20 Log #1839 NEC-P07
**Final Action:** Reject

**Comment on Proposal No:** 7-42a
**Submitter:** Mike Holt, Mike Holt Enterprises, Inc.

**Comment on Proposal No:** 7-42a
**Recommendation:** Add new FPN as follows:

FPN No. 2 to (2), (3) and (4): It is the intent of this section to allow NM Cable in any type of construction in buildings that the adopted building code permits to be of Type III, IV, or V construction.

**Substantiation:** Mr. Daly is correct in his assessment of the proposed language violating the Style Manual; however, his suggestion also does not comply. Section 3.1.2 of the Style Manual states that the term “may” “shall only be used where it recognizes a discretionary judgment on the part of an authority having jurisdiction.”

**Panel Meeting Action:** Reject

**Panel Statement:** The use of NM Cable in dwellings and structures that are permitted to be Type III, IV, or V construction but are constructed to Type I or II requirements is already permitted in 334.10 (2), (3), and (4).

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 14

7-20a Log #1779 NEC-P07
**Final Action:** Reject

**Comment on Proposal No:** 7-42a
**Submitter:** Joseph A. Hertel, Safety and Buildings

**Comment on Proposal No:** 7-45

**Recommendation:** Support proposal 7-45 and revise 334.10(3) by deleting the second sentence.

**Substantiation:** The CMP has written a rule that is ignored. While this creates a violation of the NEC, there is certainly no increased hazard in wiring buildings as they have been done for the past 40 years. A garden shed behind a dwelling cannot be wired with NM cable without covering it with a 15-minute finish rating. Is this the intent of the panel? The same applies to a detached garage as well as agricultural facilities since other nonmetallic cable articles refer to Article 334 for installation requirements. To create a list of exceptions is not in the interest of a usable code. The CMP has taken the basic rule and in the 2002 edition of the NEC added language that restricts the use of the wiring method for no apparent purpose other than restraint of trade. The basic requirement in the 1999 NEC restricted the wiring method to structures three floors or less above grade. I am not aware of any change in the composition of NM cable since 2002 that creates a hazard when the method is used in other than dwellings.

**Panel Meeting Action:** Reject

**Panel Statement:** Violations of the NEC requirements are not reason for changing requirements of the Code. The present text is inclusive of all “Other Structures”. The substantiation addresses only unfinished garages and agriculture installations where Type UF cable is preferred. No substantiation has been submitted to address why the 15-minute finish rating for these and other commercial and non-residential installations should not be required. The panel advises the submitter that these installations might be more appropriately addressed under the Type UF Cable Article.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 14

7-21 Log #678 NEC-P07
**Final Action:** Reject

**Comment on Proposal No:** 7-45
**Submitter:** James M. Daly, Upper Saddle River, NJ

**Comment on Proposal No:** 7-45

**Recommendation:** The Proposal should be Accept in Principle with the addition of an exception immediately following 334.10(3) to read:

“Exception to (3): When Type UF cable is installed as nonmetallic-sheathed cable in animal housing facilities classified as storage occupancies, the cable shall not be required to be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating.”

Revise existing “FPN No. 1” to “FPN No. 1 to (2) and (3)” and “FPN No. 2” to “FPN No. 2 to (2) and (3)”.

Add an additional Fine Print Note after FPN No. 2 to read:


**Substantiation:** The Panel was not aware of this information during consideration of the Proposal at the ROP meeting.

The three NFPA Codes classify any type of animal housing facility as a storage occupancy, defined as an “occupancy used for the storage or sheltering of goods, merchandise, products, vehicles, or animals.” A storage occupancy is typically characterized by the presence of few people, usually only owners and employees. If members of the public enter the building, the building can no longer be considered simply a storage occupancy. Additional information is contained in the NFPA Journal, November/December 2004 issue, page 22.
At its July 2004 meeting, the NFPA Standards Council approved an expansion of NFPA 150, Racetrack Stables, to include life and fire safety requirements for both humans and animals in all types of animal housing facilities and it changed the name of the committee to the Technical Committee on Animal Housing Facilities.

The submitter is correct that the use of gypsum wallboard or other thermal barriers is not appropriate in animal housing facilities. Also, 340.10(3) permits Type UF Cable to be used in wet locations.

The panel should have accepted this proposal.

7-22 Log #1782 NEC-P07
Final Action: Reject

Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 7-42
Recommendation: Revise 334.10(3) to say:
(3) Other structures permitted to be of Types III, IV, and V construction except as prohibited in 334.12.

Substantiation: The 1995 NEC limited the use of NM cable to buildings or structures not exceeding three floors above grade without the additional protection of a 15 minute finish rating. The current language requires a 15 minute finish rating in all but dwelling occupancies while the building Type limits the height of buildings to 5 or 6 stories depending on fire protection. The Code panel says there is no substantiation to address the removal of the 15 minute finish rating. Based on the previous editions of the NEC I cannot find any substantiation to keep the requirement. Can the CMP provide substantiation of what happened in the last two code cycles to make Nonmetallic-Sheathed cable hazardous?

Panel Meeting Action: Reject
Panel Statement: The current text was accepted by the panel following an appeal that resulted in a decision by the NFPA Standards Council to accept Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-23 Log #937 NEC-P07
Final Action: Reject

Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-47
Recommendation: See panel action on Comment 7-18. The action on Proposal 7-49 included only Part B item (4).

Panel Meeting Action: Reject
Panel Statement: With the installation requirements of Article 334 in accordance with 334.10(4). Panel Meeting Action: Reject
Panel Statement: The panel should have rejected this proposal.

Substantiation: This is a safety issue. Protecting wiring within residential air returns should be required, and appear as text within the confines of Article 334.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any new technical basis or documentation to support the change.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative: LADART, S.: We disagree with the panel action. This is a safety issue. Proposal 7-47 suggests that Wiring placed within residential air returns be protected by a metal raceway in order to reduce the possible spread of fire. Although there was no technical basis or documentation to support the change, many AHJ’s do not allow any wiring method to penetrate the space; therefore, it seems logical that protecting the cable by placing it within a metal raceway is a minimum effort to prevent the “spread of fire”.

7-24 Log #42 NEC-P07
Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 7-50
Recommendation: The Technical Correlating Committee directs the panel to clarify the action on this proposal. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accept the TCC direction. The panel reaffirms the action taken on Proposal 7-50 to “Revise 334.12(B)(4) to read “In wet or damp locations.” No other action is intended.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-25 Log #334 NEC-P07
Final Action: Reject

Submitter: Ronald G. Nickson, National Multi Housing Council
Comment on Proposal No: 7-49
Recommendation: Delete text as follows:
334.12 Uses Not Permitted. Type, NM, NMC, and NMS cables shall not be used under the following conditions or in the following locations:
1) For multifamily dwellings of other than Types III, IV, and V construction.
2) For non dwelling structures of other than Type III, IV, and V construction where the cables are not concealed within walls, floors and ceilings that provide a thermal barrier of materials that has at least a 25 minute finish rating, as identified in listings of fire rated assemblies.

FPN No. 1: Building constructions are defined in NFPA 220-1990, Standard on Type of Building Construction, or the applicable building code, or both.
FPN No. 2: See Annex E for determination of building types (NFPA 220, Table 3.1.1).

7-26 Log #938 NEC-P07
Final Action: Reject

Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-51
Recommendation: The panel should have rejected this proposal.

Panel Meeting Action: Reject
Panel Statement: The Exception limits installation of NM type cables into raceways that are authorized to be installed in Type I and II construction. The ampacity of NM type cables is specified in 334.80, is required to be corrected for ambient temperature and adjusted for more than 3 conductors in a raceway or cable. Chapter 9, Note to Tables (9) stipulates that the major diameter of elliptical cables shall be used to calculate the raceway fill.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative: LADART, S.: We disagree with the panel action. Proposal 7-51 should be rejected.

Type NM cable is not designed to be routinely installed within a conventional raceway system. Raceway systems are allowed to contain as much as 360 degrees of total bend between pull points. Damage to the outer sheath of NM cable, which is listed for use of up to 600 volts) could easily occur when installed within the confines of the raceway articles.
There are also reasonable concerns relating to the safe dissipation of heat. Conductors that are contained within a sheath, and then further confined within a raceway, and then possibly placed within thermal insulation creates a potential ignition source for a fire. The build up of heat will contribute to conductor insulation degradation that could ultimately lead to short circuits and ground faults: Clearly, something that the code requires that we avoid. This becomes a safety issue. Although the ampacity of NM cable is specified in 334.80, the acceptance of Proposal 7-51 establishes a new “condition of use” for NM cable with no technical substantiation for such an allowance.

7-27 Log #2203 NEC-P07 Final Action: Reject
(334.12 Exception)
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-51
Recommendation: Reject this Proposal.
Substantiation: During the Panel discussion in January, it was noted that this hybrid cable is not in production. When this comment was submitted during the 2005 NEC cycle, no data was presented to support the installation of this hybrid NM cable in a raceway system. We agree with the negative comments of Mr. Brown that Panel 6 would need to review such issues as heat dissipation, possible physical damage to the cable when pulled in a raceway, etc. Or a Fact-Finding Report should be submitted to assure that there are no negative consequences of installing the cable in a raceway. Types I and II buildings are generally hi-rise buildings where the safety of the wiring system is especially critical.
Panel Meeting Action: Reject
Panel Statement: The Exception limits installation of NM type cables into raceways that are authorized to be installed in Type I and II construction. The ampacity of NM type cables is specified in 334.80, is required to be corrected for ambient temperature and adjusted for more than 3 conductors in a raceway or cable. Chapter 9, Note to Tables (9) stipulates that the major diameter of elliptical cables shall be used to calculate the raceway fill.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-28 Log #988 NEC-P07 Final Action: Reject
(334.12(1))
Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-57
Recommendation: The panel should have accepted this proposal.
Substantiation: Consistency should remain throughout the code. Other cabling articles list the requirements concerning physical damage in their respective articles. The same requirement should appear in Article 334.
Panel Meeting Action: Reject
Panel Statement: Section 300.4 addresses protection against physical damage for all wiring methods, and it is not necessary to repeat the requirements in 334.12. In addition the requirements of 334.15(B) address physical protection of the cable.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1
Explanation of Negative:
SCHUMACHER, D.: This comment should have been accepted, Type NM cables are prone to be installed in all types of locations and conditions, and as they are the most commonly used, and the easiest to damage, they should be afforded more protection. 300.4 and 334.15(B) address how to protect cables in certain installation environments, but they do not forbid the installation of cables in all damaging locations.

7-29 Log #939 NEC-P07 Final Action: Reject
(334.12(A)(11) (New )
Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-54
Recommendation: The panel should have accepted this proposal.
Substantiation: This is a safety issue. Every attempt should be made to stop the spread of fire. We recommend a Fine Print Note to accomplish this objective.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any new technical basis or documentation to support the change.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1
Explanation of Negative:
LADART, S.: We disagree with the panel action. This is a safety issue. Proposal 7-47 suggests that: “Wiring placed within residential air returns be protected by a metal raceway in order to reduce the possible spread of fire”.
Although there was no technical basis or documentation to support the change, many AHJ’s do not allow “any” wiring method to penetrate the space; therefore, it seems logical that protecting the cable by placing it within a metal raceway is a minimum effort to prevent the “spread of fire”.

7-30 Log #644 NEC-P07 Final Action: Reject
(334.15(C))
Submitter: Mark Shapiro, Farmington Hills, MI
Comment on Proposal No: 7-58
Recommendation: Reject the proposed new wording.
Substantiation: Where cable is run at angles with joists in unfinished basements and crawl spaces.
Panel Meeting Action: Reject
Panel Statement: NM cable needs to be protected from physical damage in crawl spaces just as it is in other locations.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-31 Log #943 NEC-P07 Final Action: Reject
(334.15)
Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-58
Recommendation: The panel should have rejected this proposal.
Substantiation: This is a safety issue. This proposal will allow for unprotected wiring to be surface-installed directly to the lower edges of joists in (crawl spaces). Without a definition on what a crawl space is, this quickly becomes a hazardous situation. We feel as though there should be some well-defined height restrictions placed on the installation.
Panel Meeting Action: Reject
Panel Statement: NM cable needs to be protected from physical damage in crawl spaces just as it is in other locations.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1
Explanation of Negative:
LADART, S.: We disagree with the panel action. Proposal 7-58 should have been rejected. The proposal will allow cables that are not smaller than No. 6 AWG or three No. 8 AWG conductors to become fastened directly to the underside of crawl space joists? To drill holes in joists, so as to raise the cables, is to weaken the building’s structure. Are we requiring this just because it is not uniform with the requirements in other locations? So what? There is a level of homeowner activity in a basement that justifies the requirement to protect the cables there. Very little goes on in a crawl space and anyone working there is going to be a lot more aware of the surroundings than someone moving things around in a basement.
In other words, the claim in the original substantiation that, “the same dangers exist in both basements and crawl spaces” is simply not true. Finally, on a purely practical level (dare I mention that); aside from the unnecessary structural weakening that would result from this proposal, is there a problem that makes it worthwhile requiring people to expend the extra labor?
Panel Meeting Action: Reject
Panel Statement: NM cables need to be protected from physical damage in crawl spaces just as it is in other locations.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-32 Log #355 NEC-P07 Final Action: Accept
(334.15(B))
Submitter: Code-Making Panel 8,
Comment on Proposal No: 7-62
Recommendation: CMP-8 supports the action on this proposal by CMP-7.
Substantiation: CMP-8 supports the action on this proposal and agrees with omitting the word “rigid” in two places.
This comment has been balloted through CMP-8 with the following ballot results:
12 Eligible to Vote
11 Affirmative
1 Negative

Mr. J. Dube voted negatively stating: “CMP-8 recommends that CMP-7 reconsider this proposal and Accept it. The word “rigid” is correctly used here and is used in 300.5 also. CMP-8 has Accepted proposal to change nonmetallic to PVC.”

Mr. R. Loyd voted affirmatively stating: “Proposal 7-62 was to Accept in Principle in Part. I agree with the CMP-7 action.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-33 Log #602 NEC-P07 Final Action: Accept
(334.15(B))
Comment on Proposal No: 7-61
Recommendation: We support the proposal.
Substantiation: None given.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-34 Log #1209 NEC-P07 Final Action: Accept
(334.15(B))
Submitter: James W. Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 7-61
Recommendation: We support the Proposal as Accepted in Principle.
Substantiation: Adding the words “or grooves” to the words “in shallow chases” adds to the clarity of the original proposal. The new to read “in shallow chases or grooves.”
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-35 Log #43 NEC-P07 Final Action: Accept
(334.15(C))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 7-63
Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and correlate with action taken on Proposal 7-58. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. The panel action on Proposal 7-58 modifies the panel action on Proposal 7-63.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-36 Log #408 NEC-P07 Final Action: Hold
(334.15(C))
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 7-63
Recommendation: Revise panel third sentence:
NM cable installed on the wall of a unfinished basement or garage shall be permitted... (remainder unchanged).
Substantiation: While this is apparently not prohibited by present code and has been a common practice, it is worthwhile as clarification. However, it should not be limited to unfinished basements. It is applicable to garage walls, finished walls etc., where NM cable is permitted.
Panel Meeting Action: Hold
Panel Statement: The panel holds Comment 7-36 for further study in accordance with 4.4.6.2.2(a) of NFPA Regulations Governing Committee Projects.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-37 Log #944 NEC-P07 Final Action: Reject
(334.15(C))
Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474
Comment on Proposal No: 7-67
Recommendation: The panel should have rejected this proposal. The panel accepted it in principal in part.
Substantiation: The panel should not allow the lessening of a current code requirement on the installation of type NM cable in a crawl space. Our concern is that a crawl space is not defined. What’s the difference between a crawl space and a similar area? How is the AHJ going to make his or her ruling?
Panel Meeting Action: Reject
Panel Statement: The term “crawl space” is accepted construction industry terminology while the term “similar area” is a possibly unenforceable and a vague term which 3.2.1 of the NEC Style Manual states should not be used in the NEC.
NM cable needs to be protected from physical damage in crawl spaces just as it is in other locations.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-38 Log #1076 NEC-P07 Final Action: Reject
(334.15(C))
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 7-67
Recommendation: Revise text to read as follows: (C) Unfinished Basements, and Crawl Spaces and Similar Areas. Where cable is run at angles with joists in unfinished basements or areas of buildings that are too low to be legal for habitation nor suitable for storage.
Substantiation: I agree with Mr. Brown that “crawlspaces” should be defined.
Panel Meeting Action: Reject
Panel Statement: The phrase “legal for habitation nor suitable for storage” is vague and unenforceable. This phrase leaves too much subject to interpretation and would not be permitted by 3.2.1 of the NEC Style Manual.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-39 Log #44 NEC-P07 Final Action: Accept
(334.80)
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 7-72
Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered based on the action taken on Proposal 1-19. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-40 Log #679 NEC-P07 Final Action: Accept
(334.80)
Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 7-72
Recommendation: The panel should continue to Accept in Principle, however, the wording should be revised as follows:
Where more than two NM cables containing two or more current-carrying conductors are installed, without maintaining spacing between cables, through the same opening in wood framing that is to be fire- or draft-stopped using thermal insulation, caulk, or sealing foam, the allowable ampacity of each conductor shall be adjusted in accordance with Table 310.15(B)(2)(a) and the provisions of 310.15(A)(2), Exception, shall not apply.
Substantiation: The revised wording provides additional clarity regarding the specific installation conditions and consistency with the text used in the third paragraph.
The Panel Action eliminated the word “bundled” and, as indicated in the panel statement, the revised wording more accurately describes the installation so there is no conflict with Proposal 1-19. The definition proposed in Proposal 1-19 is not appropriate nor applicable to the installation conditions addressed in this section since there is no requirement that the cables be physically bound together.
7-42 Log #1862 NEC-P07 Final Action: Reject
(334.80)
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 7-74
Recommendation: Reject this Proposal.
Substantiation: There is still no historical data of that shows any real life instances of this being a problem. The tests that are cited were most probably done with the cables subjected to currents at 100 percent of their rated values. The heating of the cable varies with the square of the current ratio. 90% current = 81% heating; 80% current = 54% heating; 70% current = 49% heating, and so forth. Considering the provisions of 210.19 and 210.20, it is very seldom that cables are every carrying their full ampacity for any substantial length of time. With that in mind, the 2002 NEC and previous editions had excellent track records, hence the lack of any real documented fire incidents. Until this proves to be more of a real world problem and not a hypothetical issue, the NEC should not require this drastic reduction in cable ampacities.
Panel Meeting Action: Reject
Panel Statement: The test data submitted with Proposal 7-74 supported the addition of this paragraph to 334.80 and recorded that the cables were never loaded more than 80% of their rated values and some cables failed when the load was as low as 60%.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-43 Log #1865 NEC-P07 Final Action: Reject
(334.80)
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 7-71
Recommendation: This Proposal should be Accepted.
Substantiation: There is still no historical data of that shows any real life instances of this being a problem. The tests that are cited were most probably done with the cables subjected to currents at 100 percent of their rated values. The heating of the cable varies with the square of the current ratio. 90% current = 81% heating; 80% current = 54% heating; 70% current = 49% heating, and so forth. Considering the provisions of 210.19 and 210.20, it is very seldom that cables are every carrying their full ampacity for any substantial length of time. With that in mind, the 2002 NEC and previous editions had excellent track records, hence the lack of any real documented fire incidents. Until this proves to be more of a real world problem and not a hypothetical issue, the NEC should not require this drastic reduction in cable ampacities.
Panel Meeting Action: Reject
Panel Statement: The test data submitted with Proposal 7-74 supported the addition of this paragraph to 334.80 and recorded that the cables were never loaded more than 80% of their rated values and some cables failed when the load was as low as 60%.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-44 Log #1919 NEC-P07 Final Action: Reject
(334.80)
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-75
Recommendation: Accept the proposal.
Substantiation: The reference in the panel statement to Proposal 7-74 actually supports this proposal. It appears that Mr. Lindsay has come to appreciate the dramatic effect of thermal insulation on ampacity. However, the next logical step is to address insulation generally, not just in the case where cables are bundled, and not just where the cables are touching the insulation, but where they are surrounded by it. If two bundled cables touching insulation exceeded their temperature ratings (Proposal 7-74) at 0.8 times table ampacity (assume “eight” in 7-74 is actually “eighty”), then the 80% should have been applied to the 60°C rating, and then that diminished current level would have not produced excessive temperatures on the cable conductors.

7-46 Log #1831 NEC-P07 Final Action: Reject
(336.10(7))
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 7-81
Recommendation: The ACC agrees with Mr. Runyon’s explanation of negative vote on proposal 7-81. In the panel substantiation, concern is raised about damage to the cable. “Expansion of the use of TC beyond those specific applications will expose the cable to damage that it is not designed to withstand.” However, the first sentence of the proposal states, “where the cable is not subject to physical damage.” The panel should accept the proposal to use Type TC cable under the conditions listed.
Substantiation: The panel action is inconsistent with that of Panel 3 on Proposal 3-205.
Panel Meeting Action: Reject
Panel Statement: TC cables are designed for installation in cable trays. They have nonmetallic outer jackets to facilitate installation without damage to the cable conductors within. The cables are not designed for exposed installations. The differences in the physical properties nonmetallic and metallic outer coverings are very different. The tensile strength of steel and aluminum is typically 72,000 and 42,000 psi, respectively. The tensile strength of a nonmetallic covering is typically 2,000 psi. Simply installing a crush and impact requirement does not encompass the abilities of a metallic outer covering on the cable.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative: RUNYON, G.: The panel does not seem to be recognizing the proposed installations would be in areas “where the cable is not subject to physical damage.” The “—ER” in TC-ER stands for exposed run, and is UL listed for such installations. The panel should have voted to accept this comment and its corresponding proposal to allow this wiring method.

Article 336.10(7)

Final Action: Reject

(336.10(7))

Submitter: Donald A. Voltz, Mustang Engineering, Inc.

Comment on Proposal No: 7-80

Recommendation: Revise the new Exception 336.10(7) that was Accepted in Principal by the Panel as follows (underlined portion):

Exception: Where not subject to physical damage, Type TC-ER shall be permitted to transitions between cable trays and between cable trays and utilization equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support. Where this distance exceeds 1.8 m (6 ft), continuous support shall be required. Where Type TC-ER cable that complies with the crush and impact requirements for Type MC-CH, is used, the maximum distance without continuous support shall be increased to 15.2 m (50 ft) and the cable shall be supported in accordance with Article 338. The cable shall be mechanically supported where exiting the cable tray to ensure that the minimum bending radius is not exceeded.°

Substantiation: As written, the wording of the new Exception is confusing. Users may think that Type TC-ER shall be permitted to be run only 6 ft period (i.e. between cable rays, between cable trays and utilization equipment or devices). The new second sentence clears up this confusion by requiring continual support where the cable runs beyond 6 ft.

The new third sentence would recognize an improved Type TC-ER that meets the more stringent crush and impact tests for Type MC-CH cable as outlined in UL 2225. As the Panel probably knows, the 1999 NEC allowed a standard Type TC-ER that met the crush and impact requirements of Type MC to be run 50 ft outside of tray without the need for continuous support or mechanical protection as long as it was supported in accordance with Article 330. Over the last two Code cycles, the Panel has put unnecessary restrictions on it use. With the increased properties offered by this improved cable, the Panel should recognize it by allowing the original 50ft exception as was found in the 1999 Code. The Panel should take note that this cable can only be used in industrial establishments under the maintenance or supervision of qualified persons (i.e. a supervised installation). There are several cable manufacturers that offer this product.

Panel Meeting Action: Reject
Panel Statement: Type TC-ER that meets the crush and impact requirements of MC-CH are not equal to the true performance of the crush and impact of MC-CH. The 50-foot rule previously allowed was removed since it was considered unsafe. This is inconsistent with the requirement of securing and supporting in Article 336 which is 6 feet.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative: RUNYON, G.: Mr. Voltz correctly points out that the panel has increased the restrictions on the use of this cable over the last 2 code cycles without technical documentation or documented incidents where the previously allowed installation practices caused a problem. I question the intent behind the panel’s statement that TC-ER is not equal to the “true performance of the crush and impact of MC-CH...” Does that mean that if manufacturers of MC-CH were only to meet and not exceed the requirements, that MC-CH also would be an unacceptable wiring method?

Article 338 — SERVICE-ENTRANCE CABLE: TYPES SE AND USE

Final Action: Accept

(338.10(B)(2))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 7-86

Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction to reconsider and the panel accepts Proposal 7-86.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

Final Action: Accept

(338.10(B)(2))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 7-87

Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider and reaffirms its rejection of Proposal 7-87. See the panel action and statement on Comment 7-49.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

Final Action: Reject

(338.10(B)(2))

Submitter: Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474

Comment on Proposal No: 7-87

Recommendation: The panel should have accepted this proposal.

Substantiation: This is a purity issue. It has been proven that in many situations, the neutral is contributing to shock hazards, and efforts should be made to eliminate the problem.
However, this does not work for the interior of aluminum rigid conduit or e. One way to avoid pockmarking of aluminum boxes, wireways, and cable d. Where ammonia gas is present a very good solution is to purge and pressurization. liquids as a protective coating can get. Similarly, luminaire threads can be chemically related to crazy glue which makes it as impervious to gases and p. One source of ammonia gas is the clay (aluminum oxide) powder that was 3 times as bad as how an oceangoing vessel needs to be water tight. One PVC conduit in the truck unloading building of j. At this foundry waste reprocessing and recycling facility where I worked PVC rigid conduit has a tendency to fall apart for several reasons: 1. Foundry dirt jams expansion couplings. 2. Conduit fasteners are too tight that an expansion coupling does not work. 3. Expansion couplings were omitted. 4. The combination of purple primer and all weather solvent cement was not used to produce superior joints. 5. The gray PVC cement that is alleged to be the best thing for PVC conduit breaks down after a few years allowing joints to break when exposed to cold outdoor temperatures or even freezing. 6. The combination of purple primer and all weather solvent cement was not used to produce superior joints. 7. The gray PVC cement that is alleged to be the best thing for PVC conduit breaks down after a few years allowing joints to break when exposed to cold outdoor temperatures or even freezing. 8. Ericson makes watertight/gastight female cord connectors that are UL listed for use with UF cable using an oval grommet. This is 1 wiring grade better than UF, SE, and TC cables. 9. According to some people in the oil industry whom I met online through www.eng-tips.com, PVC coated steel conduit corrodes in a brine processing facility and is absolutely useless. 1. At this foundry waste reprocessing and recycling facility where I worked PVC rigid conduit has a tendency to fall apart for several reasons: 1. Foundry dirt jams expansion couplings. 2. Conduit fasteners are too tight that an expansion coupling does not work. 3. Expansion couplings were omitted. 4. The combination of purple primer and all weather solvent cement was not used to produce superior joints. 5. The gray PVC cement that is alleged to be the best thing for PVC conduit breaks down after a few years allowing joints to break when exposed to cold outdoor temperatures or even freezing. 6. The combination of purple primer and all weather solvent cement was not used to produce superior joints. 7. The gray PVC cement that is alleged to be the best thing for PVC conduit breaks down after a few years allowing joints to break when exposed to cold outdoor temperatures or even freezing. 8. Ericson makes watertight/gastight female cord connectors that are UL listed for use with UF cable using an oval grommet. This is 1 wiring grade better than UF, SE, and TC cables. 9. According to some people in the oil industry whom I met online through www.eng-tips.com, PVC coated steel conduit corrodes in a brine processing facility and is absolutely useless.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its rejection of Proposal 7-87. See the panel action and statement on Comment 7-49.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14
ARTICLE 340 — UNDERGROUND FEEDER AND BRANCH-CIRCUITABLE: TYPE UF

7-54 Log #512 NEC-P07 Final Action: Accept in Principle (340.12)(2)(7)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 7-96
Recommendation: Accept in Part (7): In hazardous (classified) locations except as otherwise permitted in this Code. Substantiation: See proposal numbers 8-113, 8-143, 8-160, 8-29, 8-101, and others where similar wording was accepted. Panel Meeting Action: Accept in Principle
The panel accepts the addition of the additional phrase, adds the word “any”, and makes location singular, and adds a comma after location, so the list item 340.12(7) reads: “(7) In any hazardous (classified) location, except as otherwise permitted in this Code” Panel Statement: The panel understands that the Section reference is to 340.12(7). 340.12(7) already contains the first phrase “In hazardous (classified) locations, and “any” is consistent with the text accepted by Panel 8 in the proposals listed in the substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 342 — INTERMEDIATE METAL CONDUIT: TYPE IMC

8-3 Log #850 NEC-P08 Final Action: Accept (342)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 8-3
Recommendation: The panel is encouraged to continue to Reject Proposal 8-3. Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs. 2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal. 3. These standards are also covered by a Fine Print Note in 110.12. 4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards. 5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B). 6. If the CMP would like to include the reference, it should be placed in the Annex with the other references. Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-4 Log #733 NEC-P08 Final Action: Accept (342.13)

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 8-7
Recommendation: Continue to Reject Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should step in to remove all Fine Print Notes of this type. Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-6 Log #851 NEC-P08 Final Action: Accept (342.13)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 8-7
Recommendation: The panel is encouraged to continue to Reject Proposal 8-7. Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs. 2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal. 3. These standards are also covered by a Fine Print Note in 110.12. 4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards. 5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B). 6. If the CMP would like to include the reference, it should be placed in the Annex with the other references. Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
8-7 Log #781 NEC-P08 Final Action: Accept in Principle (342.30(C))

Submitter: David G. Humphrey, Comment on Proposal No: 8-9
Recommendation: Revise text to read as follows:

Where oversized, concentric or eccentric knockouts are not encountered.

Type IMC shall be permitted to be unsupported where the raceway is not more than 450 mm (18 in.) in length and remains in unbroken lengths (without coupling). Such raceways shall terminate in an outlet box, device box, cabinet, or other termination at each end of the raceway.

Substantiation: The existing text does not address issues that could have a direct negative impact on the durability of the installation. The affects of weight and vibration of the raceway, especially with larger raceway sizes, may cause loosening at the raceway termination points. This loosening would certainly impede the raceways ability to safely carry the maximum fault current likely to be imposed on the raceway. Reducing the length to 450 mm (18 in.) would half the weight of the raceway in the current text, and still provide ample room to install normal supporting and securing hardware for longer lengths. Prohibiting unsupported raceways where oversized, concentric, or eccentric knockouts are encountered would serve to maintain the integrity of the equipment grounding function of the raceway.

In summation, the proposed revised text would meet the submitter’s intent and address system durability issues.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: GRIFFITH, M.: Panel action should have been to “Reject” this Comment. There is no substantiation for the limit(s) imposed by the submitter’s suggested revision. See also my Explanation of Negative Vote on Comment 8-7.

8-9 Log #1077 NEC-P08 Final Action: Accept in Principle (342.30(C))

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 8-9
Recommendation: Accept (C) but change the last sentence to “Such raceway shall terminate in an outlet box, junction box, device box, cabinet, or other termination, a threaded opening or a single knockout at each end.”

Substantiation: This substantation addresses Mr. Humphrey’s concern about concentric and eccentric knockouts, etc. It also eliminates the use of a laundry list ending in “or other termination,” which seems a plus.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-7. The panel believes that the action on Comment 8-7 meets the intent of the submitter.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: GRIFFITH, M.: Panel action should have been to “Accept” this Comment. The submission is correct except for the words “secured in place” as identified in the Panel statement. See also my Explanation of Negative Vote on Comment 8-7.
ARTICLE 344 — RIGID METAL CONDUIT: TYPE RMC

8-12 Log #852 NEC-P08 Final Action: Accept (344)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 8-11 Recommendation: The panel is encouraged to continue to Reject Proposal 8-11.
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

(Note: The sequence no. 8-13 was not used.)

8-14 Log #984 NEC-P08 Final Action: Accept in Principle in Part (344.10(A), (B), and (C))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 8-15 Recommendation: Revise as follows:
(344.10) Uses Permitted
(A) Atmospheric Conditions and Occupancies.
   (1) Galvanized Steel and Stainless Steel RMC, Galvanized steel and stainless steel RMC shall be permitted under all atmospheric conditions and occupancies.
   (2) Red brass RMC, Red brass RMC shall be permitted to be installed for direct burial and swimming pool applications.
   (3) Aluminum RMC, Aluminum RMC shall be permitted to be installed where judged suitable for the environment. Rigid aluminum conduit encased in concrete or in direct contact with the earth shall be provided with approved supplementary corrosion protection.
   (4) Ferrous Raceways and Fittings, Ferrous raceways and fittings protected from corrosion solely by enamel shall be permitted only indoors and in occupancies not subject to severe corrosive influences.
(B) Corrosion Corrosive Environments.
   (1) Galvanized Steel, Stainless Steel and Red Brass RMC, Elbows, Couplings, and Fittings, Galvanized steel, stainless steel and red brass RMC, elbows, couplings, and fittings shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences where protected by corrosion protection and judged suitable for the condition.
   (2) Supplementary Protection of Aluminum RMC, Aluminum RMC shall be provided with approved supplementary corrosion protection where encased in concrete or in direct contact with the earth.
FPN: The galvanizing on steel (ferrous) RMC provides corrosion protection. The AHJ may require supplementary corrosion protection for severely corrosive environments. Where aluminum (non-ferrous) RMC is encased in concrete or direct-buried, approved supplementary corrosion protection may be required. This protection can be provided in a variety of ways including factory PVC-coating, tape-wrapping, or painting with a zinc-rich paint.
(C) Cinder Fill, Galvanized steel, stainless steel and red brass RMC shall be permitted to be installed in or under cinder fill where subject to permanent moisture where protected on all sides by a layer of noncinder concrete not less than 50 mm (2 in.) thick; where the conduit is not less than 450 mm (18 in.) under the fill; or where protected by corrosion protection and judged suitable for the condition.

Substantiation: Titles were added to the sub-sections to comply with the NEC Style Manual. The text was changed in the FPN from mandatory text to non-mandatory text in compliance with the NEC Style Manual.

Panel Meeting Action: Accept in Principle in Part
Accept the title changes as recommended, reject the revision proposed to the FPN, and in addition, delete the FPN in its entirety.
Panel Statement: The FPN creates a conflict with the requirement.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-15 Log #730 NEC-P08 Final Action: Accept (344.13)

Submitter: Robert Kellerer, Paramount Electrical Services
Comment on Proposal No: 8-19 Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, IECI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-16 Log #731 NEC-P08 Final Action: Accept (344.13)

Submitter: Robert Kellerer, Paramount Electrical Services
Comment on Proposal No: 8-18 Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, IECI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Report on Comments A2007 — Copyright, NFPA

70-210
8-17 Log #732 NEC-P08  
Final Action: Accept  
(344.13)

Submitter: Robert Kelleher, Paramount Electrical Services  
Comment on Proposal No: 8-11  
Recommendation: Continue to Reject  
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen manual Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBEW, ACE, NEA, NEII, SHFA, AISI, ASHE, AHAM, ICEAI, NVBU, and dozens of others when they decide to develop income through generic standards development.  
If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.  
It is important to note that the American Iron and Steel Institute publicly endorses NEC publications as a “tool to assist untrained electricians to make safer and better installations.” However, 90.1(C) states that the NEC is not intended “as a design specification or an instruction manual for untrained persons.” The TCC should step in to remove all Fine Print Notes of this type.  
Panel Meeting Action: Accept  
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

8-18 Log #853 NEC-P08  
Final Action: Accept  
(344.13 (New ))

Submitter: John P. Masarick, Independent Electrical Contractors Inc.  
Comment on Proposal No: 8-18  
Recommendation: The panel is encouraged to continue to Reject Proposal 8-18.  
Substantiation: The reasons to continue to Reject the Proposal are as follows:  
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.  
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.  
3. These standards are also covered by a Fine Print Note in 110.12.  
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.  
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).  
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.  
Panel Meeting Action: Accept  
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

8-19 Log #854 NEC-P08  
Final Action: Accept  
(344.13)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.  
Comment on Proposal No: 8-19  
Recommendation: The panel is encouraged to continue to Reject Proposal 8-19.  
Substantiation: The reasons to continue to Reject the Proposal are as follows:  
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.  
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.  
3. These standards are also covered by a Fine Print Note in 110.12.  
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.  
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).  
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.  
Panel Meeting Action: Accept  
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

8-20 Log #782 NEC-P08  
Final Action: Accept  
(344.30(C))

Submitter: David G. Humphrey, Midlothian, VA  
Comment on Proposal No: 8-23  
Recommendation: Revise text to read as follows:  
1. The referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).  
Panel Meeting Action: Accept  
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

8-21 Log #966 NEC-P08  
Final Action: Accept  
(344.30(C))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.  
Comment on Proposal No: 8-23  
Recommendation: Add an introduction to the new (C) provided in the proposal to read as follows:  
4.34.30 Securing and Supporting  
RMC shall be installed as a complete system in accordance with 300.18 and shall be securely fastened in place and supported in accordance with 344.30(A) and (B) or permitted to be unsupported in accordance with 344.30(C).  
(C) Unsupported raceways. Type RMC shall be permitted to be unsupported where the raceway is not more than 900 mm (3 ft) length and remains in unbroken lengths (without coupling). Such raceways shall terminate in an outlet box, junction box, device box, cabinet, or other termination at each end of the raceway.  
Substantiation: This added new subsection (C) needs an introduction in the main text to comply with the NEC Style Manual.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-22 Log #1078 NEC-P08 Final Action: Accept in Principle (344.30(C))

Submitter: David Shapiro, Safety First Electrical Contracting & Safety Education

Comment on Proposal No: 8-23
Recommendation: Accept (C) but change the last sentence to “Such raceway shall terminate in an outlet box, junction box, device box, cabinet, or other termination, a threaded opening or a single knockout at each end.”

Substantiation: This modification addresses Mr. Humphrey’s concern about concentric and eccentric knockouts, etc. It also eliminates the use of a laundry list ending in “or other termination,” which seems a plus.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-20. The panel believes that the action on Comment 8-20 meets the intent of the submitter.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
GRIFFITH, M.: Panel action should have been to “Reject” this Comment. There is no substantiation for the limit(s) imposed by the submitter’s suggested revision. See also my Explanation of Negative Vote on Comment 8-20.

8-23 Log #1395 NEC-P08 Final Action: Accept in Principle in Part (344.30(C))

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-23
Recommendation: Revise text to read as follows:
(c) Unsupported raceways: Type RMC shall be permitted to be unsupported where the raceways are not more than 600 mm (2 ft) 900 mm (3 ft) in length and remains in unbroken lengths (without coupling). Such raceway shall terminate where oversized, eccentric or concentric knockout are not encountered in an outlet box, junction box, device box, cabinet, or other termination at each end of the raceway.

Substantiation: This allowance should only be allowed for 24” nipples or less in length. Many times RMC nipples, as described in Table 9 Note 4, are installed for the intent of allowing additional conductor conduit fill. By following the 24” length of this note for nipples provides consistency for short sections of raceway being installed and meet submitters intent. Additionally, support shall be installed if oversized, eccentric, or concentric knockouts are encountered to maintain assured grounding and bonding continuity due to vibration or loose oversized knockouts.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel action on Comment 8-20 satisfies the eccentric or concentric issue of the submitter; however, the panel rejects the recommendation to increase the unsupported lengths to two feet.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
GRIFFITH, M.: Panel action should have been to “Reject” this Comment. The revision suggested by the submitter is new material and is not substantiated. See also my Explanation of Negative Vote on Comment 8-20.

8-24 Log #1922 NEC-P08 Final Action: Reject (344.30(C) (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 8-23
Recommendation: Reject the proposal.

Substantiation: The concept of a special support rule for short lengths of raceway run between enclosures of various sorts is without technical substantiation, and at variance from routine trade practice. No such requirement has ever been in the NEC. Raceways generally require support within 3 ft of terminations, and when the entire length is just that long, then no additional support is ever required. In effect, the locknuts and bushings or connectors and locknuts at each end are supports. This is not a new concept for the NEC: CMP 7 just added the wording “(wiring method) fittings shall be permitted as a means of cable support” in a number of cable articles. In addition, this section allows up to 5 ft of raceway to be unsupported, except at the outer end. In the case of IMC and RMC, that 5-ft length can be broken and contain any number of short segments coupled together. This proposal is without precedent, and addresses a nonexistent problem.

Panel Meeting Action: Reject
Panel Statement: Section 344.30(A) specifically states, “Each RMC shall be securely fastened within 900 mm (3 ft) of each outlet box, junction box, device box, cabinet, conduit body, or other conduit termination.” There is no special support rule, just the already existing securely fastened rule. See also panel action on Comment 8-20.

Article 348 — Flexible Metal Conduit: Type FMC

8-25 Log #2041 NEC-P08 Final Action: Accept in Principle (348.30)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-35
Recommendation: Revise as follows: FMC shall be securely fastened in place and supported in accordance with 348.30(A) and (B).

(A) Securely Fastened. FMC shall be securely fastened in place by an approved means within 300 mm (12 in.) of each box, cabinet, conduit body, or other conduit termination and shall be supported and secured at intervals not to exceed 1.4 m (4 ft).

Exception No. 1: Where FMC is fished.
Exception No. 2: At terminals where installed for flexibility is required, lengths shall not exceed the following:
Substantiation: There are installations of metallic flex being installed under exception 2 with the allowance for increased distance for supports. Permanently attached electrical equipment and appliances are being connected under the guise of “where flexibility is required.” “Is required” is not enforceable term. Additionally, there have been instances that engineers, architects, and installers are determining what type of flexibility is required and specify the allowance for expanded support allowances. Why should the “exception” allowing for flexibility when equipment is permanently attached to structure and there is no need for flexibility? The intent of this section is for equipment that requires flexibility such as motors with belt tension adjustments, or equipment that has constant movement in normal operations. See attached picture as an example.

Panel Meeting Action: Accept in Principle
Panel Statement: The revised panel wording clarifies the intent of the submitter.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-26 Log #2035 NEC-P08 Final Action: Reject (348.30(A) Exception No. 4)

Submitter: Donald Cook, Shelby County Building Inspections

Comment on Proposal No: 8-39
Recommendation: Accept proposal as submitted.

Substantiation: While I understand and agree with the panel statement that a raceway that closely follows the surface upon which it is installed is less likely to become damaged by penetration of screws, nails, etc., I fail to understand how that statement is different in an accessible or non-accessible ceiling. As an installer and an AHJ, I have worked above accessible and non-accessible ceilings and found both to sometimes have building surfaces where raceways could be secured and found both sometimes to sometimes be suspended and not have building surfaces where raceways could be secured. Available building surfaces is not directly related to the accessibility of the ceiling.

Panel Meeting Action: Reject
Panel Statement: Accessible ceilings are drop ceilings with removal panels that are not likely to have screws or nails driven through them and penetrating the FMC. Also 300.11(A) states that cables and raceways shall not be supported by the ceiling grids.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

70-212
8-27 Log #1079 NEC-P08 Final Action: Accept
(348.60)
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 8-41
Recommendation: I support the panel in accepting the new text as written.
Substantiation: I am concerned about the “accept in principle” comments. If there are field reports of inspectors rejecting jobs where flexibility is required, not due to continuous movement but due to vibration or occasional movement or adjustment, then the wording ought to be modified. As it stands, “flexibility after installation” is a useful clarification, and encompasses all these.
Panel Meeting Action: Accept
Panel Statement: Panel 8 agrees that the panel action on Proposal 8-41 should have been “Accept in Principle”. The panel statement would remain the same.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-28 Log #2042 NEC-P08 Final Action: Reject
(348.60)
Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-40
Recommendation: Revise as follows:
348.60 Grounding and Bonding. Where used to connect equipment where installed for flexibility is required, an equipment grounding conductor shall be installed.
Where FMC not installed for flexibility is not required, FMC shall be permitted to be used as an equipment grounding conductor when installed in accordance with 250.118(5).
Where required or installed for flexibility, equipment grounding conductors shall be installed in accordance with 250.134(B).
Where required or installed for flexibility, equipment bonding jumpers shall be installed in accordance with 250.102.
Substantiation: Required is applied to this section as a mandatory requirement. Additionally, as with earlier substantiation, “where required” is not enforceable. The sentence states that an “Equipment grounding conductor shall be installed” so the requirement for conductor installation should be when a wiring method is installed as needed for specific connection conditions. There are wiring methods that can be installed that provides flexibility, but determining where flexibility is required is subjective between inspectors, installers, engineers creating confusion. As stated by CMP-7 (7-32), even M/C cable is a general wiring method and is not limited to installations for flexibility. Normally, inspectors find these types of corrections after the fact which creates hardship and loss of production time to end users if the FMC installation is not “for flexibility.”
Panel Meeting Action: Reject
Panel Statement: The new text in the 2008 draft for 348.60 based on ROP 8-40 and 8-41 makes it clear when an equipment grounding conductor is or is not required.
348.60 Grounding and Bonding. Where used to connect equipment where flexibility is required after installation, an equipment grounding conductor shall be installed.
Where flexibility is not required after installation, FMC shall be permitted to be used as an equipment grounding conductor when installed in accordance with 250.118(5).
Where flexibility is not required after installation, FMC shall be permitted to be used as an equipment grounding conductor when installed in accordance with 250.134(B).
Where required or installed for flexibility, equipment bonding jumpers shall be installed in accordance with 250.102.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

ARTICLE 350 — LIQUIDTIGHT FLEXIBLE METAL CONDUIT: TYPE LFMC
8-29 Log #2044 NEC-P08 Final Action: Accept in Principle
(350.30)
Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-47
Recommendation: Revise as follows:
A) Securely Fastened. LFMC shall be securely fastened in place by an approved means within 300 mm (12 in.) of each box, cabinet, conduit body, or other conduit termination and shall be supported and secured at intervals not to exceed 1.4 m (4 ft).
Exception No. 1: Where LFMC is fishable.
Exception No. 2: Lengths not exceeding 300 mm (12 in.) at terminals where installed for flexibility is necessary, required, lengths shall not exceed the following:
Substantiation: The committee approved the change for exception 2 to replace “necessary” with “required” as part of 8-44. By removing “required” and replacing with “installed for” flexibility provides a clear intended purpose for the less restrictive support. There is still confusion between inspectors, engineers and inspectors of “required” flexibility. Who makes the decision of “required” flexibility. There are instances where LFMC is attached to electrical equipment and appliances that are physically attached to structure and the raceway flexibility is installed as a convenience, not a necessity for protection from repetitive vibration or motion. Where “required” makes enforcement extremely difficult due to the different interpretations between inspectors, installers and engineers. Inspectors determine “required” differently causing inconsistency between inspectors and AHJ’s.
Note: Supporting material is available for review at NEC headquarters.
Panel Meeting Action: Reject
Panel Statement: The revised panel wording clarifies the intent of the submitter.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-30 Log #1080 NEC-P08 Final Action: Accept
(350.60)
Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education
Comment on Proposal No: 8-50
Recommendation: I support the panel in accepting the new text as written.
Substantiation: I am concerned about the “accept in principle” comments. If there are field reports of inspectors rejecting jobs where flexibility is required not due to continuous movement but due to vibration or occasional movement or adjustment, then the wording ought to be modified. As it stands, “flexibility after installation” is a useful clarification, and encompasses all these.
Panel Meeting Action: Accept
Panel Statement: Panel 8 agrees that the panel action on Proposal 8-50 should have been “Accept in Principle”. The panel statement would remain the same.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-31 Log #2043 NEC-P08 Final Action: Reject
(350.60)
Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-51
Recommendation: Revise as follows:
350.60 Grounding and Bonding. Where used to connect equipment where installed for flexibility is required, an equipment grounding conductor shall be installed.
Where FMC not installed for flexibility is not required, FMC shall be permitted to be used as an equipment grounding conductor when installed in accordance with 250.118(6).
Where flexibility is not required after installation, FMC shall be permitted to be used as an equipment grounding conductor when installed in accordance with 250.134(B).
Where required or installed for flexibility, equipment bonding jumpers shall be installed in accordance with 250.102.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-32 Log #2044 NEC-P08 Final Action: Accept
(350.30)
The manufacturer of the cellular-core PVC conduit system had originally listed and labeled their product according to the product standard for Schedule 40 and 80 Rigid PVC Conduit and Fittings, ANSI/UL 651. The UL accepted testing indicated that the “non-homogeneous” PVC conduit met all the performance requirements of “homogeneous” PVC conduit, with the possible exception of sunlight resistance. The code panel has neither test data nor technical substantiation to indicate sufficient performance different to warrant excluding the cellular-core PVC conduit from PVC Construction specification in Article 352.

The proposed revision will add very detailed and confusing material requirements within the NEC, with the practical result of effective suppression of suitable alternative technologies - and repetitive future work in Panel 8 to address product level details better addressed in the applicable product standard for the products.

KENDALL, D.: The panel comment 8-45a (CC801) should never have been created nor accepted. Instead, Comment 8-45 should have been accepted. By approving Comment 8-45a, the panel set a precedent to allow new products, or other wiring methods to be accepted for applications without NRTL testing. Comment 8-42 utilized a substantiation based completely on non-NRTL testing.

Comment on Affirmative: GRIFFITH, M.: See my Affirmative with Comment on Panel Action on Comment 8-42.

8-33 Log #1677 NEC-P08 Final Action: Accept
(352.12 Exception (New))

Submitter: Joseph S. Zinnnoch, The Okonite Company

Comment on Proposal No: 8-58
Recommendation: Accept the original Proposal.
Substantiation: A temperature drop exists from the conductor to the outer insulation or jacket surface of any wire or cable. For medium voltage cables, when the conductor is operating at 105°C, the outer jacket surface operates at 90°C or less due to the greater insulation thickness and other components like the inner and outer semiconducting screens plus the shield or neutral wires. The worst case scenario for medium voltage cables is 5 kV cables with a thin (90 mil wall).

I have submitted calculation results for 5 kV cables (with 90 mils of insulation) in ductbank configurations from Figure 310.60 for both Detail 2 and Detail 3 (3 x 2). The calculations were made using USamps Ampacity program that uses the Nehr-McGrath method. The column titled “Tdw” is the temperature of the inner duct wall. In all calculations, this temperature is below 90°C. Additionally since the introduction of the 105°C rated MV cables into the code, many 105°C rated cables have been installed in 90°C NM ducts without incident. Also submitted are copies of the ductbank dimensions and a legend to read the USamps output data.

1 Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: As stated in the panel statement for Proposal 8-58, 352.12(E) Exception permits 105 degree C medium voltage cables to be used with rigid nonmetallic conduit, Type PVC, when the cable is operated at a temperature lower than the conduit’s listed temperature rating.

The panel does not wish to establish a precedent of revising the exception for a single condition based solely on computer calculations instead of actual test data.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-34 Log #2504 NEC-P08 Final Action: Accept
(352.12(A))

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 8-59
Recommendation: Based on the actions taken on Proposal 14-33a, the American Chemistry Council supports CMP-8 actions on Proposals 8-59 and 8-60. CMP-14 supports text in Articles 352 for Rigid Nonmetallic Polyvinyl Chloride Conduit and Art 355 for Reinforced Thermosetting Rebars. CMP-14 agrees with Proposal 8-59 in its entirety.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the first sentence of the comment and recognizes that the remainder of the comment more properly belongs in the substantiation for the comment, not as part of the recommendation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-38 Log #785 NEC-P08 Final Action: Accept (352.30(C))

Submitter: David G. Humphrey, Midlothian, VA
Comment on Proposal No: 8-65
Recommendation: Revise text to read as follows:
Where oversized, concentric or eccentric knockouts are not encountered, Type RNC shall be permitted to be unsupported where the raceway is not more than 450 mm (18 in.) and remains in unbroken lengths (without coupling). Such raceways shall terminate in an outlet box, device box, cabinet, or other termination at each end of the raceway.

Substantiation: The existing text does not address issues that could have a direct negative impact on the durability of the installation. The affects of weight and vibration of the raceway, especially with larger raceway sizes, may cause loosening at the raceway termination points. Movement as described could additionally result in a weakening of the joined rings of concentric and eccentric knockouts and where on the raceway fitting in contact with the enclosure to which it is connected. Reducing the length to 450 mm (18 in.) would half the weight of the raceway in the current text, and still provide ample room to install normal supporting and securing hardware for longer lengths. Prohibiting unsupported raceways where oversized, concentric, or eccentric knockouts are encountered would serve to maintain the integrity of the equipment installation.

In summation, the proposed revised text would meet the submitter’s intent and address system durability issues.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: GRIFFITH, M.: Panel action on this Comment should have been to “Reject” rather than to “Accept” for the following reasons:
1. The new language suggesting an 18 in. limit completely changes the intent of the original proposal which was to clarify a widespread practice in industry that is already implied to be acceptable by existing code language and for which there is no evidence to change.
2. The spacing of 18 in. is new material that has not had public review and is not substantiated.
3. The limitation to installations “where oversized...knockouts are not encountered” has not been substantiated. In addition, concerns about knockouts can be addressed by any of several installation methods representing good workmanship that result in adequate support
Panel action on the original Proposal 8-65 should continue to apply.

8-39 Log #967 NEC-P08 Final Action: Accept in Principle (352.30(C))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 8-65
Recommendation: Add an introduction to the new (C) provided in the proposal to read as follows:
352.30 Securing and Supporting RNC shall be installed as a complete system as provided in 300.18 and shall be fastened so that movement from thermal expansion or contraction is permitted. RNC shall be securely fastened and supported in accordance with 352.30(A) and (B) or permitted to be unsupported in accordance with 344.30(C).

(A) and (B) are unchanged in this comment and the proposal.

Unsupported raceways. Type PVC conduit RNC shall be permitted to be unsupported where the raceway is not more than 900 mm (3 ft) in length and remains in unbroken lengths (without coupling). Such raceway shall terminate in an outlet box, junction box, device box, cabinet, or other termination at each end of the raceway.

Substantiation: This added new subsection (C) needs an introduction in the main text to comply with the NEC Style Manual.

Panel Meeting Action: Accept in Principle
Change the NEC reference from 344.30(C) to 352.30(C).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-35 Log #302 NEC-P08 (352.12(A)(1)) Final Action: Accept

Submitter: Code-Making Panel 14, Comment on Proposal No: 8-60
Recommendation: Based on the actions taken on Proposal 14-33a, CMP-14 supports CMP-8’s actions on Proposals 8-59 and 8-60. CMP-14 supports text in Articles 352 for Rigid Polyvinyl chloride Conduit and proposed Article 355 for Reinforced Thermosetting Resin Conduit that recognizes the wiring methods permitted in Chapter 5.

Substantiation: This comment supports correlation of the requirements in Chapters 3 and 5.
This comment was balloted through CMP-14 with the following ballot results:
14 Eligible to Vote
14 Affirmative

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-36 Log #729 NEC-P08 (352.13) Final Action: Accept

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 8-64
Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBPU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-37 Log #85 NEC-P08 (352.13) Final Action: Accept

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 8-64
Recommendation: The panel is encouraged to continue to Reject Proposal 8-64.
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel action on Comment 8-38 satisfies the eccentric or concentric issue of the submitter; however, the panel rejects the recommendation to increase the unsupported length to 2 feet.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
GRIFFITH, M.: Panel action should have been to “Reject” this Comment. There is no substantiation for the limitation(s) imposed by the submitter’s suggested revision. See also my Explanation of Negative Vote on Comment 8-38.

Recommendation:
Revise 352.30(C) (New)

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12 Negative: 0

Comment on Proposal No: 8-40
Revise 352.100 to read as follows:
(352.100) 8-38 Log #1923 NEC-P08
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 8-45a.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12 Negative: 0

Explanation of Negative:
GRIFFITH, M.: The submitter is encouraged and reminded to consider using the TIA process should further test results become available to support a broader application of the cellular-core product than allowed by 352.100 as stipulated in Panel Comment 8-45a.

Recommendation:
Revise 352.100 to read as follows:
(352.100) 8-43 Log #1394 NEC-P08
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 8-45a.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12 Negative: 0

Comment on Proposal No: 8-44
Revise 352.100 to read as follows:
(352.100) 8-44 Log #1396 NEC-P08
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 8-45a.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12 Negative: 0

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-65
Revise text to read as follows:
(352.100) 8-65
Panel Meeting Action: Accept in Principle in Part
Panel Statement: Section 352.30(A) specifically states, “Each Type PVC shall be securely fastened within 900 mm (3 ft) of outlet box, junction box, device box, cabinet, conduit body, or other conduit termination.” There is no special support rule; just the already existing securely fastened rule. See also panel action on Comment 8-38.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:
GRIFFITH, M.: Panel action should have been “Accept in Principle” for this Comment. The submitter’s substantiation is correct except for his (likely unintended) reference to “support” instead of “secured in place” as identified in the panel statement. See also my Explanation of Negative Vote on Comment 8-38.

Recommendation:
Revise 352.30(C) (New)

Submitter: Steven Tollenson, Cantex Inc.
Comment on Proposal No: 8-68
Revise 352.100 to read as follows:
(352.100) 8-68
Panel Meeting Action: Reject
Panel Statement: The panel action on Comment 8-68 is supported by Section 352.30(A) and 352.100, as amended by Comment 8-45. The panel action is that Proposal 8-68 should be rejected.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12 Negative: 0

Comment on Proposal No: 8-69
Revise 352.100 to read as follows:
(352.100) 8-69
Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel action on Comment 8-69 is supported by Section 352.30(A) and 352.100, as amended by Comment 8-45. The panel action is that Proposal 8-69 should be accepted.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12 Negative: 0
foaming agents. The foam in this conduit is a closed cell technology design. It is not open cell such as foam in a cooler or cushion. The proposal would have a significant impact on competition without data to prove the product is a safety hazard. No safety hazard has been established and it has already passed all but one UL 651 standard test. The product has already passed the first phase of the remaining test and final results on that test are expected in the near future. Cellular-core conduit has already been accepted in specifications of utilities for the past ten years without a shock or fire hazard being reported. As an inspector and engineer, I am concerned any time I see the code being used as a competition tool without adequate substantiation. Product with the produced quality and safety application should stand on its own merit. Respectfully ask this Panel to consider removing the change and additional language of this proposal based on the grounds of no scientific data to substantiate the proposal and its good safety record.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 8-45a.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

(350.100)

8-45 Log #2157 NEC-P08

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 8-45a.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-46 Log #728 NEC-P08

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 8-45a.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

ARTICLE 353 — HIGH DENSITY POLYETHYLENE CONDUIT: TYPE HDPE CONDUIT

8-46 Log #728 NEC-P08

Final Action: Accept
(353.13)

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 8-71

Recommendation: Continue to Reject

Substantiation: Continue to Reject. The addendum of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are compilations of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, BWE, IAEI, ACC, NEA, NEI, SIHA, AISI, API, ASHTE, AHEM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comments to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: "As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons." The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

(355.10)

8-48 Log #1380 NEC-P08

Final Action: Reject

Submitter: William Wagner, Certification Solutions

Comment on Proposal No: 8-79

Recommendation: This Proposal should be accepted and revised as follows: 355.10 Uses Permitted. The use of RTRC shall be permitted in accordance with 352.10(A) through (F).

(A) Concealed. RTRC shall be permitted in walls, floors, and ceilings.
(B) Corrosive Influences. RTRC shall be permitted in locations subject to severe corrosive influences as covered in 300.6 and where subject to chemicals for which the materials are specifically approved.
(C) Cinder. RTRC shall be permitted in cinder fill.
(D) Wet Locations. RTRC shall be permitted in portions of dairies, laundries, camera, or other wet locations and in locations where walls are frequently washed, the entire conduit system including boxes and fittings used therewith shall be installed and equipped so as to prevent water from entering the conduit. All supports, bolts, straps, screws, and so forth, shall be corrosion-resistant materials or be protected against corrosion by approved corrosion-resistant materials.
(E) Dry and Damp Locations. RTRC shall be permitted for use in dry and damp locations not prohibited by 355.12.
(F) Exposed. RTRC shall be permitted for exposed work where not subject to physical damage if identified for such use.
(G) Underground Installations. For underground installations, see 300.5 and 300.50.
FPN: Refer to Article 352 for Rigid Polyvinyl Chloride Conduit: Type PVC and Article 353 for High Density Polyethylene Conduit: Type HDPE.

(H) Support of Conduit Bodies. RTRC shall be permitted to support nonmetallic conduit bodies not larger than the largest trade size of an entering raceway. These conduit bodies shall not support luminaries (Fixtures) or other equipment and shall not contain devices other than splicing devices as permitted by 110.14(B) and 314.16(C)(2).

(D) Insulation Temperature Limitations. For conductors or cables operating at a temperature higher than the RTRC listed operating temperature rating. Exception: Conductors or cables rated at a temperature higher than the RTRC listed temperature rating shall be permitted to be installed in RTRC, provided they are not operated at a temperature higher than the RTRC listed temperature rating.

Exception: Conduits, other raceway systems, and other air-handling spaces as covered in 300.22, unless constructed of phenolic and listed as having adequate fire-resistant and low smoke-producing characteristics.

(H) Riser. RTRC shall not be used in riser applications unless constructed of phenolic and listed as having adequate fire-resistant and low smoke-producing characteristics.

Panel Meeting Action: Reject

Panel Statement: Individual raceway articles do not need to duplicate acceptable systems provided that they have been included in 300.22. However, the proposed revision to include phenolic RTRC in 300.22 represents such a significant departure from the types of raceway that have been previously accepted in these applications, that it is believed to warrant a corresponding reference in 355.10 of the NEC as well.

Therefore, in consideration of the data generated by an independent, NRTL accredited test laboratory, and in conjunction with UL’s stated position on this issue, these conduit products have conclusively demonstrated their ability to perform acceptably in both plenum and riser applications and I recommend their inclusion in NEC 355.10 in accordance with the revised proposal. It should be noted that this proposal has been slightly modified from its original version in order to delete the FPN indicating suggested acceptance criteria for these products. The development of appropriate flame and smoke criteria, along with the product’s listing requirements is best left to the determination of the listing organization. However, regardless of which of the established flame and smoke criteria the listing organization chooses, phenolic RTRC has demonstrated its ability to perform safely.

Additionally, a reference to “phenolic” RTRC conduit has been added in order to limit this proposal to only that conduit type which was evaluated as part of the technical substantiation provided with this comment. Note: Supportive data is available for review at NFPA Headquarters.
Additionally, a reference to “phenolic” RTRC conduit has been added in order to limit this proposal to only that conduit type which was evaluated as part of the technical substantiation provided with this comment. 

Note: Supporting material is available for review at NFPA Headquarters. 

Panel Meeting Action: Reject 


Number Eligible to Vote: 12 

Ballot Results: Affirmative: 11 Abstain: 1  

Explanation of Abstention: 

HUMPHREY, D.: See my explanation of abstaining vote on Comment 8-49. 

8-49b Log #CC800 NEC-P08  
Final Action: Accept  
(355.30) 

Submitter: Code-Making Panel 8, 
Comment on Proposal No: 8-78 
Recommendation: Revise text of 355.30 to read as follows: 
355.30 Secured Supping 

RTRC shall be installed as a complete system in accordance with 300.18 and shall be securely fastened in place and supported in accordance with 355.30(A) and (B) or permitted to be unsupported in accordance with 355.30(C). 

(A) Securely Fastened. RTRC shall be securely fastened within 900 mm (3 ft) of each outlet box, junction box, device box, conduit body, or other conduit termination. Conduit listed for securing at other than 900 mm (3 ft) shall be permitted to be installed in accordance with the listing. 

(B) Supports. RTRC shall be supported as required in Table 355.30. Conduit listed for support at spacing other than as shown in Table 355.30 shall be permitted to be installed in accordance with the listing. Horizontal runs of RTRC supported by openings through framing members at intervals not exceeding those in Table 355.30 and securely fastened within 900 mm (3 ft) of termination points shall be permitted. 

(C) Unsupported Raceways. Where oversized, concentric or eccentric knockouts are not encountered, Type RTRC shall be permitted to be unsupported where the raceway is not more than 450 mm (18 in.) and remains in unbroken lengths (without coupling). Such raceways shall terminate in do outlet box, device box, cabinet, or other termination at each end of the raceway. 

Substantiation: This comment correlates with the panel actions on Comments 8-7, 8-8, 8-20, 8-21, 8-38, 8-39, 8-57, and 8-58 for Type RTRC. 

Panel Meeting Action: Accept 

Number Eligible to Vote: 12 

Ballot Results: Affirmative: 11 Negative: 1  

Explanation of Negative: 

GRIFFITH, M.: The panel text for 355.30(C) should be revised to read as follows: 

(A) Securely Fastened. RTRC shall be securely fastened within 900 mm (3 ft) of each outlet box, junction box, device box, conduit body, or other conduit termination. Conduit listed for securing at other than 900 mm (3 ft) shall be permitted to be installed in accordance with the listing. 

(B) Supports. RTRC shall be supported as required in Table 355.30. Conduit listed for support at spacing other than as shown in Table 355.30 shall be permitted to be installed in accordance with the listing. Horizontal runs of RTRC supported by openings through framing members at intervals not exceeding those in Table 355.30 and securely fastened within 900 mm (3 ft) of termination points shall be permitted. 

(C) Unsupported Raceways. Where oversized, concentric or eccentric knockouts are not encountered, Type RTRC shall be permitted to be unsupported where the raceway is not more than 450 mm (18 in.) and remains in unbroken lengths (without coupling). Such raceways shall terminate in do outlet box, device box, cabinet, or other termination at each end of the raceway. 

Panel accepted the text in this comment in order to correlate with similar text in accepted comments for the other raceway articles. The text regarding knockouts and the 18 in. length limit should not apply as explained in my Explanation of Negative Votes on Comments 8-7, 8-20, 8-38, and 8-57. 

ARTICLE 356 — LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT: TYPE LFNC 

8-50 Log #727 NEC-P08  
Final Action: Accept  
(356.13) 

Submitter: Robert Kelleher, Paramount Electrical Services 
Comment on Proposal No: 8-85 
Recommendation: Continue to Reject 
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBEW, IAEI, ACC, NETA, NEI, SEIA, ASI, API, ASHE, AHAM, ICEAI, NYBFEU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an ANSI should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included. 

Panel Meeting Action: Accept 

Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation. 

Number Eligible to Vote: 12 

Ballot Results: Affirmative: 12 

8-51 Log #857 NEC-P08  
Final Action: Accept  
(356.13 (New) ) 

Submitter: John P. Masarick, Independent Electrical Contractors Inc. 
Comment on Proposal No: 8-85 
Recommendation: The panel is encouraged to continue to Reject Proposal 8-85. 
Substantiation: The reasons to continue to Reject the Proposal are as follows: 

1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs. 
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal. 
3. These standards are also covered by a Fine Print Note in 110.12. 
4. The FPNs should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards. 
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B). 
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references. 

Panel Meeting Action: Accept 

Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation. 

Number Eligible to Vote: 12 

Ballot Results: Affirmative: 12 

ARTICLE 358 — ELECTRICAL METALLIC TUBING: TYPE EMT 

8-52 Log #2204 NEC-P08  
Final Action: Reject  
(358.10, FPN ) 

Submitter: William A. Wolfe, Steel Tube Institute of North America 
Comment on Proposal No: 8-94 
Recommendation: Revise the text as follows and accept this comment; 
FPN: The galvanizing on steel (ferrous) EMT provides supplementary corrosion protection. When steel EMT is in direct contact with the earth or is installed in concrete, supplementary corrosion protection may be required. When aluminum (non-ferrous) EMT is in direct contact with the earth or is installed in concrete, supplementary corrosion protection is required. 
Substantiation: Proposal 8-94 was a companion proposal to proposal 8-15 on Rigid Metal Conduit. The Panel accepted proposal 8-15 which added a Fine Print Note to differentiate between the corrosion protection required for steel rigid conduit versus aluminum rigid conduit. There has been confusion in the field as to when supplementary corrosion protection is required for these two different metals. 

The Panel did not accept the addition of the FPN in this proposal. Article 358 covers aluminum and steel electrical metallic tubing. The Panel stated that since this mandatory language in the FPN and that there was a reference to 300.6. The revised text addresses those issues by removing the mandatory language and the reference to 300.6. With these changes, the Panel should be able to accept this proposal and make their action on this proposal consistent with their action on Proposal 8-15. The FPN provides useful guidance and reflects the listing requirements in the UL Electrical Construction Equipment Directory. 

Panel Meeting Action: Reject 

Panel Statement: The panel still maintains that the reference to 300.6 in the FPN gives the installer the proper reference to determine corrosion protection requirements. 
It is not acceptable per the NEC Style Manual for fine print notes (FPNs) to state “Mandatory Text”. The last sentence in the proposed text indicates that supplementary corrosion protection “is required.” 

Number Eligible to Vote: 12 

Ballot Results: Affirmative: 12
Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 8-95
Recommendation: Revise 358.10(B) to say:
(B) Electrical metallic tubing shall not be used in direct contact with earth, in concrete slabs or floors poured on earth, or in exterior concrete walls below grade.
Substantiation: The CMP rejected the proposal and should reconsider in the comments. The panel indicates that EMT is suitable where corrosion protection is provided in accordance with 358.10(B). 358.10(B) says “where protected by corrosion protection and judged suitable for the condition.” Is the galvanized coating from the manufacturer the corrosion protection envisioned by the CMP or is it something they should specify?
Panel Meeting Action: Reject
Panel Statement: The authority having jurisdiction will determine the suitability of a corrosion protection method.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 8-102
Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAE, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 8-102
Recommendation: The panel is encouraged to continue to Reject Proposal 8-102.
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPNs should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 8-90
Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAE, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Submitter: David G. Humphrey, Midlothian, VA
Comment on Proposal No: 8-104
Recommendation: Revise text to read as follows:
Where oversized, concentric or eccentric knockouts are not encountered, Type EMT shall be permitted to be unsupported where the raceway is not more than 900 mm (3 ft) 450 mm (18 in.) and remains in unbroken lengths (without coupling). Such raceways shall terminate in an outlet box, device box, cabinet, or other termination at each end of the raceway.
Substantiation: The existing text does not address issues that could have a direct negative impact on the durability of the installation. The affects of weight and vibration of the raceway, especially with larger raceway sizes, may cause loosening at the raceway termination points. This loosening would certainly impose an impediment to the raceways ability to safely carry the maximum fault current likely to be imposed on the raceway. Reducing the length to 450 mm (18 in.) would half the weight of the raceway in the current text, and still provide ample room to install normal supporting and securing hardware for longer lengths. Prohibiting unsupported raceways where oversized, concentric, or eccentric knockouts are encountered would serve to maintain the integrity of the equipment grounding function of the raceway.
In summation, the proposed revised text would meet the submitter’s intent and address system durability issues.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1

Report on Comments A2007 — Copyright, NFPA
The spacing of 18 in. is new material that has not had public review and is not substantiated.

The limitation to installations “where oversized...knockouts are not encountered” has not been substantiated. In addition, concerns about knockouts can be addressed by any of several installation methods representing good workmanship that result in adequate support.

Panel action on the original Proposal 8-104 should continue to apply.

8-58 Log #968 NEC-P08 Final Action: Accept (358.30(C))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 8-104
Recommendation: Revise as follows:
EMT shall be installed as a complete system in accordance with 300.18; and shall be securely fastened in place and supported in accordance with 358.30(A) and (B) or permitted to be unsupported in accordance with 358.30(C).

(C) Unsupported raceways. Type EMT shall be permitted to be unsupported where the raceway is not more than 900 mm (3 ft) in length and remains in unbroken lengths (without coupling). Such raceway shall terminate in an outlet box, junction box, device box, cabinet, or other termination at each end of the raceway.

Substantiation: This added new subsection (C) needs an introduction in the main text to comply with the NEC Style Manual.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-59 Log #1398 NEC-P08 Final Action: Accept in Principle in Part (358.30(C))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-104
Recommendation: Revise text to read as follows:
(c) Unsupported raceways. Type EMT shall be permitted to be unsupported where the raceways is not more than 900 mm (3 ft) in length and remains in unbroken lengths (without coupling). Such raceway shall terminate in an outlet box, junction box, device box, cabinet, or other termination at each end of the raceway.

Substantiation: This allowance should only be allowed for 24” nipples or less in length. Many times EMT nipples, as described in Table 9 Note 4, are installed for the intent of allowing additional conductor conduit fill. By following the 24” length of this note for nipples provides consistency for short sections of raceway being installed and meet submitter’s intent. Additionally, support shall be installed if oversized, eccentric, or concentric knockouts are encountered to maintain assured grounding and bonding continuity due to vibration or loose oversized knockouts.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel action on Comment 8-57 satisfies the eccentric or concentric issue of the submitter; however, the panel rejects the recommendation to increase the unsupported length to 2 feet.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: GRIFFITH, M.: Panel action should have been “Reject” this comment. There is no substantiation for the limit(s) imposed by the submitter’s suggested revision. See also my Explanation of Negative Vote on Comment 8-57.

8-60 Log #1925 NEC-P08 Final Action: Reject (358.30(C) (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-104
Recommendation: Reject the proposal.

Substantiation: The concept of a special support rule for short lengths of raceway run between enclosures of various sorts is without technical substantiation, and at variance from routine trade practice. No such requirement has ever been in the NEC. Raceways generally require support within 3 ft of terminations, and when the entire length is just that long, then no additional support is ever required. In effect, the locknuts and bushings or connectors and locknuts at each end are supports. This is not a new concept for the NEC: CMP 7 just added the wording “[wiring method] fittings shall be permitted as a means of cable support” in a number of cable articles. If this and its companion proposals remain accepted, the various tubular rigid raceways will be expected to grow clamps where they will look rather strange, such as in the middle of a 90° sweep if it has a coupling and a 3-in. extension to make a required distance. This proposal is without precedent, and addresses a nonexistent problem.

Panel Meeting Action: Reject
Panel Statement: Section 358.30(A) specifically states, “Each Type EMT shall be securely fastened within 900 mm (3 ft) of each outlet box, junction box, device box, cabinet, conduit body, or other conduit termination.” There is no special support rule, just the already existing securely fastened rule. See also the panel action on Comment 8-57.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: GRIFFITH, M.: Panel action should have been “Accept in Principle” for this comment. The submitter’s substantiation is correct except for his (likely unintended) reference to “support” instead of “secured in place” as identified in the Panel statement. See also my Explanation of Negative Vote on Comment 8-57.

ARTICLE 362 — ELECTRICAL NONMETALLIC TUBING: TYPE EMT

8-61 Log #724 NEC-P08 Final Action: Accept (362.13)

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 8-114
Recommendation: Continue to Reject

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEE, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFDU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-62 Log #859 NEC-P08 Final Action: Accept (362.13 (New))

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 8-114
Recommendation: The panel is encouraged to continue to Reject Proposal 8-114.

Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs. 2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal. 3. These standards are also covered by a Fine Print Note in 110.12. 4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. 5. The NEC is not intended to be an instruction manual for untrained persons. If the FPNS are allowed to reference these standards, then they should list all applicable standards. 6. Since the referenced instruction standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).

If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
ARTICLE 368 — BUSWAYS

8-63 Log #2353 NEC-P08 Final Action: Accept (368.6)

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 8-129

Recommendation: Continue to Reject the Proposal.

Substantiation: There has been no substantiation presented that a safety issue exists that would warrant a listing requirement on busway.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

WALBRECHT, G.: The submitter’s substantiation in Proposal 8-129 is correct in stating that the AHJ does not have the means to determine the safety of the design and manufacture of busways. The panel should reconsider the fact that many panels including this one have required listing for far less hazardous and complex items.

WALBRECHT, G.: UL agrees with the panel that “in view” and “out of view” should not be adopted for this section. However, we agree with the panel that “Exposed” and “Concealed” are being used improperly in this section and instead suggest replacing “Exposed” with “Where Visible” and “Concealed” with “Behind Access Panels” as the subsection titles for 368.10(A) and (B) respectively. This more closely describes the text of the requirements.

Ballot Results: Affirmative: 12

8-64 Log #1926 NEC-P08 Final Action: Reject (368.10)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 8-131

Recommendation: Accept the proposal.

Substantiation: The panel statement did not rebut the assertion in the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Panel Meeting Action: Accept

Panel Statement:
The terms “Exposed” and “Concealed” are commonly used and understood throughout the National Electrical Code. “In View” and “Out of View” may have been more appropriate for other sections of the National Electrical Code, but in this case Panel 8 believes that those terms would only deviate from the commonly used terms without the appropriate substantiation to make the revision.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

WALBRECHT, G.: UL agrees with the panel that “in view” and “out of view” should not be adopted for this section. However, we agree with the submitter that the terms “exposed” and “concealed” are being used improperly in this section and instead suggest replacing “Exposed” with “Where Visible” and “Concealed” with “Behind Access Panels” as the subsection titles for 368.10(A) and (B) respectively. This more closely describes the text of the requirements.

8-65 Log #723 NEC-P08 Final Action: Accept (368.13)

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 8-135

Recommendation: Continue to Reject

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 8 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, ASI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development.

Panel Meeting Action: Accept

Panel Statement: Panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

8-66 Log #860 NEC-P08 Final Action: Accept (368.13 (New))

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 8-135

Recommendation: The panel is encouraged to continue to Reject Proposal 8-135.

Substantiation: The reasons to continue to Reject the Proposal are as follows:

- The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
- There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
- These standards are also covered by a Fine Print Note in 110.12.
- The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
- Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
- If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

8-67 Log #1382 NEC-P08 Final Action: Accept (368.56(A))

Submitter: William Wagner, Certification Solutions

Comment on Proposal No: 8-136

Recommendation: This Proposal should be Accepted as revised:

- The panel accepts the comment to continue to reject the proposal and reiterates its substantiation for that rejection as stated in the ROP: “As 90.1(C) states: This Code is not intended as a design specification or instruction manual for untrained persons.” The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12
This proposal has been revised to remove the reference to HDPE, as the submitter agrees with the panel statement that HDPE is not permitted to be used as a branch from a busway.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

ARTICLE 374 — CELLULAR METAL FLOOR RACEWAY

8-68 Log #1752 NEC-P08 Final Action: Hold (374.17)

Submitter: John Michlovic, H.H. Robertson Floor Systems

Recommendation: Revise text to read as follows: Amppacity of conductors. The ampacity adjustment factors in 310.15(B)(2) Table 374.17 shall apply to conductors installed in cellular metal raceways.

Substantiation: ROP 8-148 (Log #1057) seeks an exception to 374.17 so as to eliminate the perceived need to use “loop wiring” and “violate 374.7” in relation to multiple outlets on the same circuit. In lieu of adopting an isolated exception to address the proponent’s particular concern, this Comment suggests that NFPA amend 374.17 more comprehensively to establish an ampacity reduction table specifically applicable to cellular metal floor raceways.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Hold

Panel Statement: The comment introduces a concept that has not had public review in accordance with 4.4.6.2.2 of the Regulations Governing Committee Projects.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

ARTICLE 376 — METAL WIREWAYS

8-69 Log #49 NEC-P08 Final Action: Accept (376.6)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 8-151

Recommendation: It was the action of the Technical Correlating Committee that the panel reconsider the proposal as it is unclear what “one of a kind” means and that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel action on Comment 8-71.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

8-70 Log #696 NEC-P08 Final Action: Reject (376.6)

TCC Action: The Technical Correlating Committee understands that the panel agrees with the substantiation provided by the submitter of Comment 8-71 and their action to Accept.

Submitter: Jamie McNamara, Hastings, MN

Comment on Proposal No: 8-151

Recommendation: The panel should continue to accept this proposal in principle and have the exception read: “Exception: Custom made, and field-fabricated wireways and fittings shall not be required to be listed.”

Substantiation: The TCC concerns of the term “one of a kind” being unclear is warranted and the term has been removed from the proposed exception. The close vote and the comments of the panel members make it clear that this is a very important and divided issue and there is merit in all the comments expressed. Installers and inspectors do not have the ability in the field to determine the suitability of a raceway (metal wireways) as to its condition of use. Metal wireways and associated fittings should be listed to provide for a minimum standard of safety that all standard metal wireways and associated fittings should meet.

Panel Meeting Action: Reject

Panel Statement: See panel action on Comment 8-71.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

DABE, J.: The panel should have accepted this comment. Custom made or Field Fabricated wireways may be used under the exception, however, a listed product used whenever possible for standardized construction is the preferred method.

WALBRECHT, G.: The authority having jurisdiction will not have the means available to determine the safety of the design, manufacture, and installation of a metal wireway. Wireways and their associated fittings, as with any wiring method, should be evaluated and listed by a nationally recognized third party certification organization. Field fabrication and modification of factory-produced components can also be hazardous and should be properly examined and evaluated by a nationally recognized testing organization.

8-71 Log #1832 NEC-P08 Final Action: Accept (376.6)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 8-151

Recommendation: Reject this Proposal.

Substantiation: In the Explanation of Negative all of the commenters state the same concern. Metal Wireways are more often field fabricated than purchased components made into an assembly. There are not enough options made by the manufacturers to fit the needs of the field. Customizing of listed metal wireway components would void the listing. This is an impractical requirement. No technical substantiation has been provided that there is a problem with the current installations. If custom made or field fabricated metal wireways are acceptable, per the Exception, then why require any of them be listed.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

8-72 Log #906 NEC-P08 Final Action: Hold (376.10)

Submitter: Nicholas P. Ludlam, FM Approvals

Comment on Proposal No: 8-157a

Recommendation: Revise as follows: 376.10 Uses Permitted. The use of metal wireways shall be permitted in the following:

(1) For exposed work.

(2) In concealed spaces as permitted in 376.10(4).

(3) In hazardous (classified) locations as permitted by 501.10(B) for Class I, Division 2 locations; 502.10(B) for Class II, Division 2 locations and 504.20, 505.15(A) and 506.15(A) for intrinsically safe wiring; 505.15(C) for Class I Zone 2 locations; and 506.15(C) for Zone 22. Where installed in wet locations, wireways shall be listed for the purpose.

(4) As extensions to pass transversely through walls if the length passing through the wall is unbroken. Access to the conductors shall be maintained on both sides of the wall.

Substantiation: Articles 505 and 506 include additional hazardous classified locations which are not addressed by this wiring technique.

Panel Meeting Action: Hold

Panel Statement: The comment introduces a concept that has not had public review in accordance with 4.4.6.2.2 of the Regulations Governing Committee Projects. The recommendation is for a revision to 376.10, yet Proposal 8-157a is on 376.10.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

8-73 Log #696 NEC-P08 Final Action: Accept (376.80)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.

Comment on Proposal No: 8-157

Recommendation: Revise as follows:

376.22 Number of Conductors and Ampacity. The number of conductors and their ampacity shall comply with (A) and (B).

(A) Cross-Sectional Areas of Wireway. The sum of the cross-sectional areas of all contained conductors at any cross section of a wireway shall not exceed 20 percent of the interior cross-sectional area of the wireway.

(B) Adjustment Factors. The adjustment factors in 310.15(B)(2)(a) shall be applied only where the number of current-carrying conductors, including neutral conductors classified as current-carrying under the provisions of 310.15(B)(4), exceeds 30. Conductors for signaling circuits or controller conductors between a motor and its starter and used only for starting duty shall not be considered as current-carrying conductors.

Substantiation: Added titles to the subsections to comply with the NEC Style Manual.
Good judgment has prevailed. Everyone with whom we have discussed this.

ADAMS, M.: This wiring method is subject to physical damage. We feel that, in all likelihood of failure, this will be protected. Nowhere in 300.4 does it provide for an exception if the wiring is installed on walls and ceilings without mechanical protection. This is contrary to “CONCEALMENT”. The system is designed to utilize an inherent safety extension have a level of shock protection equivalent to a GFCI. This will be protected.” Nowhere in 300.4 does it provide for an exception if the wiring has a “level of shock protection equivalent to a GFCI.”

FAHRENTHOLD, C.: Proposal 7-98 has written concealable nonmetallic extensions should not be added to the code unless there are provisions for the wiring to be protected from physical damage.

LADART, S.: We disagree with the panel action. Supplementary overcurrent protection and active safety devices are always a welcomed addition to augment the safety of an acceptable wiring method, and not to attempt to “make safe” the design of an unsafe circuit. The revised wording provides additional protection against possible arcing and miswired circuits. The UL Fact Finding Study supporting these additions is available at NFPA headquarters. The study showed that all shock and fire hazards were mitigated with the exception of arcing. The proposed revision requires arc protection to be added to the listing requirements. Line and Load-Side Miswired Protection addition improves the overall performance of all the integral safety functionality by insuring the system will not energize if either the line or load-side of the CNE is miswired.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept
Panel Statement: The Panel accepts the Fact Finding Report and resulting requirements to add arc fault and miswire protection.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:
Richard Temblador, Southwire Company

Comment on Proposal No: 7-98

Recommendation: Revise text to read as follows:
(382.6) Level of protection equivalent to a portable GFCI
(5) Provide protection from the effects of arc faults

Panel Meeting Action: Reject
Panel Statement: The panel action and statement on Comment 7-56.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 11 Negative: 3

Explanation of Negative:
ADAMS, M.: “This wiring method is subject to physical damage.

FAHRENTHOLD, C.: Proposal 7-98 has written concealable nonmetallic extension into Article 382. These concealable nonmetallic extensions can be installed on walls and ceilings without mechanical protection. This is contrary to 300.4 which states that: “where subject to physical damage, conductors shall be protected.”” Nowhere in 300.4 does it provide for an exception if the wiring has a “level of shock protection equivalent to a GFCI.”

Proposal 7-98 has put in the requirement that the concealed nonmetallic extension have a level of shock protection equivalent to a GFCI. This will provide a person without a nail and install new. This can be an expensive undertaking for the person that did not know that the wiring was concealed behind the paint, texture, etc. when they drove the nail into the wall.

The panel should have rejected this proposal.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-56.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 0

Explanation of Negative:

LADART, S.: We disagree with the panel action. Supplementary overcurrent protection and active safety devices are always a welcomed addition to augment the safety of an acceptable wiring method, and not to attempt to “make safe” an unacceptable wiring method. Concealable nonmetallic extensions are an unacceptable wiring method, and the employment of active safety devices to protect the dangerous circuit is as ridiculous as the placement of “seat belts” on motorcycles. Proposal 7-98 should be rejected.

Panel Meeting Action: Accept
Panel Statement: The Panel accepts the Fact Finding Report and resulting requirements to add arc fault and miswire protection.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

LADART, S.: We disagree with the panel action. Supplementary overcurrent protection and active safety devices are always a welcomed addition to augment the safety of an acceptable wiring method, and not to attempt to “make safe” the design of an unsafe circuit.

Make no mistake about it. We have been opposed to this wiring method for extending a branch circuit from the very beginning. The safety of an electrical circuit is a product of design and conditions of use. This product cannot be designed for its intended application, and meet the safety standards as set forth in 90.1.

In the name of safety, we have an obligation to recommend the rejection of this proposal.

7-56 Log #2231 NEC-P07 Final Action: Accept

7-57 Log #1081 NEC-P07 Final Action: Accept in Principle

Submitter: Richard Temblador, Southwire Company

Comment on Proposal No: 7-98

Recommendation: Revise text to read as follows:
(382.6) Level of protection equivalent to a portable GFCI
(5) Provide protection from the effects of arc faults

Panel Meeting Action: Accept
Panel Statement: The Panel accepts the Fact Finding Report and resulting requirements to add arc fault and miswire protection.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

LADART, S.: We disagree with the panel action. Supplementary overcurrent protection and active safety devices are always a welcomed addition to augment the safety of an acceptable wiring method, and not to attempt to “make safe” an unacceptable wiring method. Concealable nonmetallic extensions are an unacceptable wiring method, and the employment of active safety devices to protect the dangerous circuit is as ridiculous as the placement of “seat belts” on motorcycles. Proposal 7-98 should be rejected.

Panel Meeting Action: Accept
Panel Statement: The Panel accepts the Fact Finding Report and resulting requirements to add arc fault and miswire protection.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

LADART, S.: We disagree with the panel action. Supplementary overcurrent protection and active safety devices are always a welcomed addition to augment the safety of an acceptable wiring method, and not to attempt to “make safe” the design of an unsafe circuit.
to “make safe” an unacceptable wiring method. Concealable nonmetallic extensions are an unacceptable wiring method, and the employment of active safety devices to protect the dangerous circuit is as ridiculous as the placement of “seat belts” on motorcycles.

**Comment on Affirmative:**

STEWART, H.: The additional proposed protection mitigates the requirement of physical protection of concealable non-metallic extensions.

**7-57a Log #CC700 NEC-P07**

**Final Action:** Accept

(382.12(5))

**Submitter:** Code-Making Panel 7

**Comment on Proposal No:** 7-99

**Recommendation:** Reject Proposal 7-99 and do not add new 382.12(5).

**Substantiation:** The listing for the products addresses the permitted use of the product under the provisions of Article 382. Acceptance of the recommendation of Proposal 7-99 would have precluded the intended use of nonmetallic extensions.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 14

**7-58 Log #925 NEC-P07**

**Final Action:** Reject

(382.12(5) (New))

**Submitter:** Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474

**Comment on Proposal No:** 7-99

**Recommendation:** We agree with the panel action to accept this proposal. See my Affirmative Comment on Vote on this Proposal.

**Substantiation:** Non metallic extensions should never be installed where subject to physical damage.

**Panel Meeting Action:** Rejected

**Panel Statement:** The listing for the products addresses the proper use of the product under the provisions of this Article.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 11 Negative: 3

**Explanation of Negative:**

ADAMS, M.: This wiring method is subject to physical damage. No electrical installation should be installed where physical damage is so easily anticipated.

FAHRENTHOLD, C.: Proposal 7-99 to add the requirement that the concealable nonmetallic extensions should not be permitted to be installed “where subject to physical damage” is consistent with the code. This requirement correlates with 300.4 which states that: “where subject to physical damage, conductors shall be protected.” No where in 300.4 does it provide for an exception if the wiring has a “level of shock protection equivalent to a GFCI” which is the only requirement for the concealable nonmetallic extension that is part of Proposal 7-99. The concealable nonmetallic extension should have as a requirement that they be protected from physical damage.

LADART, S.: We disagree with the panel action. The panel action on Proposal 7-99 at the proposal stage added a new 382.12(5) that made that EMT (Electrical Metallic Tubing) is not permitted where subject to physical damage. Article 358 covers EMT and allows the use of EMT where not subject to severe physical damage. Since code users read the ROP for educational purposes in addition to keeping current on actions on code proposals, it is important to correct misstatements when they occur.

**Comment on Affirmative:**

DALY, J.: See my explanation of affirmative vote on Comment 7-59.

**7-59 Log #1413 NEC-P07**

**Final Action:** Reject

(382.12(5) (New))

**Submitter:** Vince Baclawski, National Electrical Manufacturers Association (NEMA)

**Comment on Proposal No:** 7-99

**Recommendation:** NEMA agrees with the panel action.

**Substantiation:** NEMA submits this comment to correct incorrect statements by the submitter by Mr. Brown who submitted an affirmative comment. Statements were made that EMT (Electrical Metallic Tubing) is not permitted where subject to physical damage. Article 358 covers EMT and allows the use of EMT where not subject to severe physical damage. Since code users read the ROP for educational purposes in addition to keeping current on actions on code proposals, it is important to correct misstatements when they occur.

**Panel Meeting Action:** Rejected

**Panel Statement:** The listing for the products addresses the proper use of the product under the provisions of this Article.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 14

**7-60 Log #923 NEC-P07**

**Final Action:** Reject

(383 (New))

**Submitter:** Samuel R. LaDart, City of Memphis / Rep. IBEW Local 474

**Comment on Proposal No:** 7-101

**Recommendation:** We disagree with the panel action to accept this proposal.

**Substantiation:** This is a safety issue. The proposed wiring method is too fragile to be exposed to physical damage, and should not be allowed in the code.

**Panel Meeting Action:** Rejected

**Panel Statement:** See panel action and statement on Comment 7-56.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 12 Negative: 2

**Explanation of Negative:**

ADAMS, M.: This wiring method is subject to physical damage. No electrical installation should be installed where physical damage is so easily anticipated.

FAHRENTHOLD, C.: Proposal 7-101 provides for a new article that covers the use, installation, and construction specifications for Concealable Nonmetallic Extensions.

Although we encourage and promote the development of new wiring methods, the Concealable Nonmetallic Extension method is unacceptable. AC Flatwire is a fragile wiring method, with thin flat conductors, separated by thin layers of insulating material. The wiring method is designed to be surface mounted on a dwelling or office wall using adhesives, and then painted for “concealment”. The system is designed to utilize an inherent safety system that is built within.

Good judgment has prevailed. Everyone with whom we have discussed this wiring method has quickly asked: Since I cannot see the “concealed wiring”, how can I avoid penetrating it with a nail, screw, or some other foreign object? The answer is quite clear. You cannot protect this wiring method from physical damage. The proposal suggests that there was no need to protect the wiring method from physical damage. We disagree for a number of reasons. AC Flatwire is nonrepairable, and it must be stripped from the wall in the inevitable event of failure. We feel that; in all likelihood of failure, this will become an economical disadvantage to the consumer. Our foremost concern is product safety. The panel accepted this proposal on a “fact finding study”, and not on the merits of “product approval” by a testing lab. The substantiation for this proposal suggests that no protection from physical damage is necessary because the circuit for the nonmetallic extension is designed with “inherent” protection to protect against shock hazards.

Would you or your loved ones feel safe while driving a nail into an energized 120 volt circuit under any set of circumstances that could possibly exist?

Circuits containing “inherent” safety devices are vital in preventing shock hazards associated with approved wiring methods. We feel, however, that the “inherent” design of an electrical circuit is placed within the circuit to augment the safety of an acceptable wiring method, and not for the purpose of attempting to “make safe” the design of an unsafe circuit.

Make no mistake about it. We have been opposed to this wiring method for extending a branch circuit from the very beginning. The safety of an electrical circuit is a product of design and conditions of use. This product cannot be designated for its intended application, and meet the safety standards as set forth in 90.1.

In the name of safety, we have an obligation to recommend the rejection of this proposal.
8-75 Log #344 NEC-P08  
Final Action: Accept  
(384.22)

Submitter: Brian Dolan, IBEW/NECA Technical Institute  
Comment on Proposal No: 8-170  
Recommendation: Revise text to read:

Shall not exceed the percentage fill using Table 384.22 and applicable conductors, feeders, branch circuits, communications circuits, control circuits, and signaling circuits.

Panel Meeting Action: Accept  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

ARTICLE 388 — SURFACE NONMETALLIC RACEWAYS

8-76 Log #1928 NEC-P08  
Final Action: Accept  
(388.56)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.  
Comment on Proposal No: 8-176  
Recommendation: Accept the proposal in principle. Instead of deleting the word “removable”, replace it with “capable of being opened in place” placed immediately after the word “cover”. Instead of deleting the third sentence of the rule, retain it, but change “removable” to “capable of being opened in place” with those new words following the word “covers”.

Panel Meeting Action: Accept  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

ARTICLE 392 — CABLE TRAYS

8-77 Log #1473 NEC-P08  
Final Action: Hold  
(392)

Submitter: Richard E. Loyd, Sun Lakes, AZ, James Imlah  
Comment on Proposal No: 8-180  
Recommendation: Revise Article 392 as follows:

ARTICLE 392 Cable Tray Systems

I. General

392.1 Scope. This article covers cable tray systems, including ladder, ventilated trough, ventilated channel, solid bottom, and other similar structures.

FPN: For further information on cable trays, see ANSI/NEMA–VE-1-1998, Metal Cable Tray Systems; NEMA–VE 2-1996, Metal Cable Tray Installation Guidelines; and NEMA–FG-1998, Nonmetallic Cable Tray Systems.

392.2 Definition.

Cable tray System. A unit or assembly of units or sections and associated fittings forming a structural system used to securely fasten or support cables and raceways.

FPN: Cable trays are not raceways they are mechanical support systems. See definition of raceway in Article 100.

II. Installation

392.3 10 Uses Permitted. Complete systems. Cable trays shall be installed as a complete system. Cable trays and their associated fittings shall be identified for the intended use.

(A) Cable tray shall be permitted to be used as a support system for service conductors, feeders, branch circuits, communications circuits, control circuits, and signaling circuits.

(B) Cable tray installations shall not be limited to industrial establishments.

(C) Where exposed to direct rays of the sun, insulated conductors and jacketed cables shall be identified as being sunlight resistant.

(D) Cable tray systems shall be permitted to have mechanically discontinuous segments between cable tray runs or between cable tray runs and equipment.

The system shall provide for the support of the cables in accordance with their corresponding articles.

(E) Where cable trays support individual conductors and where the conductors pass from one cable tray to another, or from a cable tray to raceway(s) or from a cable tray to equipment where the conductors are terminated, the distance between cable trays or between the cable tray and the raceway(s) or the equipment shall not exceed 1.8 m (6 ft). The conductors shall be secured to the cable tray(s) at the transition, and they shall be protected, by guarding or by location, from physical damage.

(F) In all locations (A) Wiring Methods. The wiring methods in Table 392.40(A)(6) (F) shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.

Table 392.40(A)(6) (F) Wiring Methods

<table>
<thead>
<tr>
<th>Wiring Method</th>
<th>Article Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored cable</td>
<td>320</td>
</tr>
<tr>
<td>Communication raceways</td>
<td>800</td>
</tr>
</tbody>
</table>
| Electrical metallic tubing | 358
| Electrical nonmetallic tubing | 362 |
| Fire alarm cables | 760 |
| Flexible metal conduit | 348 |
| Flexible metallic tubing | 360 |
| Instrumentation tray cable | 727 |
| Intermediate metal conduit | 342 |
| Liquidtight flexible metal conduit | 350 |
| Liquidtight flexible nonmetallic conduit | 356 |
| Metal-clad cable | 330 |
| Mineral-insulated, metal-sheathed cable | 332 |
| Multiconductor service-entrance cable | 338 |
| Multiconductor underground feeder | 340 |
| and branch-circuit cable | 340 |
| Nonmetallic-sheathed cable | 334 |
| Power and control tray cable | 336 |
| Power-limited tray cable | 725.61(C) and 725.82(E) |
| Optical fiber cables | 770 |
| Optical fiber raceways | 770 |
| Rigid metal conduit | 344 |
| Rigid nonmetallic conduit | 352 |

Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays.

(#) In Industrial Establishments Only. The wiring methods in Table 392.40(A)(6) (F) shall be permitted to be used in any industrial establishment under the conditions described in their respective articles. In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installed cable tray system any of the cables in 392.3 10(G) (1) (f)(i) and (G) (4) (f)(i) shall be permitted to be installed in ladder, ventilated trough, solid bottom, or ventilated channel cable trays.

(1) Single Conductors. Single conductor cables shall be permitted to be installed in accordance with (B)(1)(a) through (B)(1)(e).

(f) (1) Single-conductor cable shall be 1/0 AWG or larger and shall be of a type listed and marked on the surface for use in cable trays. Where 1/0 AWG through 4/0 AWG single-conductor cables are installed in ladder cable tray, the maximum allowable rung spacing for the ladder cable tray shall be 225 mm (9 in.).

(2) (2) Welding cables shall comply with the provisions of Article 630, Part IV.

(3) (3) Single conductors used as equipment grounding conductors shall be insulated, covered, or bare, and they shall be 4 AWG or larger.


(H) Equipment Grounding Conductors. Metallic cable trays shall be permitted to be used as equipment grounding conductors where continuous maintenance and supervision ensure that qualified persons service the installed cable tray system and the cable tray complies with provisions of 392.40(A)(6).
### Table 392.22(C) Allowable Cable Fill Area for Multiconductor Cables in Ladder, Ventilated Trough, or Solid Bottom Cable Trays for Cables Rated 2000 Volts or Less

<table>
<thead>
<tr>
<th>Inside Width of Cable Tray</th>
<th>Column 1 Applicable for 392.9(A)(22)(C) (1)</th>
<th>Column 2 Applicable for 392.9(A)(22)(C) (1) &amp; (2) Only</th>
<th>Column 3 Applicable for 392.9(C)(22) (C) (2) Only</th>
<th>Column 4a Applicable for 392.9(C)(22) (C) (3) Only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm2</td>
<td>in.2</td>
<td>mm2</td>
<td>in.2</td>
</tr>
<tr>
<td>150</td>
<td>6.0</td>
<td>7.9</td>
<td>4,300</td>
<td>4,300</td>
</tr>
<tr>
<td>225</td>
<td>9.0</td>
<td>10.5</td>
<td>6,000</td>
<td>6,000</td>
</tr>
<tr>
<td>300</td>
<td>12.0</td>
<td>14.0</td>
<td>9,000</td>
<td>9,000</td>
</tr>
<tr>
<td>450</td>
<td>18.0</td>
<td>21.0</td>
<td>13,500</td>
<td>13,500</td>
</tr>
<tr>
<td>600</td>
<td>24.0</td>
<td>28.0</td>
<td>18,000</td>
<td>18,000</td>
</tr>
<tr>
<td>750</td>
<td>30.0</td>
<td>35.0</td>
<td>22,500</td>
<td>22,500</td>
</tr>
<tr>
<td>900</td>
<td>36.0</td>
<td>42.0</td>
<td>27,000</td>
<td>27,000</td>
</tr>
</tbody>
</table>

1 The maximum allowable fill areas in Columns 2 and 4 shall be calculated. For example, the maximum allowable fill in mm2 for a 150-mm wide cable tray in Column 2 shall be 4500 minus (30 multiplied by Sd) [the maximum allowable fill, in square inches, for a 6-in. wide cable tray in Column 2 shall be 7 minus (1.2 multiplied by Sd)].

2 The term Sd in Columns 2 and 4 is equal to the sum of the diameters, in mm, of all cables 107.2 mm (in inches, of all 4/0 AWG) and larger multiconductor cables in the same cable tray with smaller cables.
(a) Where a ladder or ventilated trough cable tray having a usable inside depth of 150 mm (6 in.) or less contains multiconductor control and/or signal cables only, the sum of the cross-sectional areas of all cables at any cross section shall not exceed 90 percent of the cable tray width, and the cables shall be installed in a single layer.

(b) Where all of the cables are smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables shall not exceed the maximum allowable cable fill area in Column 3 of Table 392.22 (C) for the appropriate cable tray width.

(c) Where 4/0 AWG or larger cables are installed in the same cable tray with cables smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables shall not exceed the maximum allowable fill area resulting from the computation in Column 4 of Table 392.22 (C) for the appropriate cable tray width. The 4/0 AWG and larger cables shall be installed in a single layer, and no other cables shall be placed on them.

(d) Solid Bottom Cable Trays Containing Any Mixture. Where solid bottom cable trays contain multiconductor power or lighting cables, or any mixture of multiconductor power, lighting, control, and signal cables, the maximum number of cables shall conform to the following:

(1) Where all of the cables are 4/0 AWG or larger, the sum of the diameters of all cables shall not exceed 90 percent of the cable tray width, and the cables shall be installed in a single layer.

(2) Where all of the cables are smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables shall not exceed the maximum allowable fill area specified in Column 2 of Table 392.22 (C).

(e) Solid Bottom Cable Tray — Multiconductor Control and/or Signal Cables (a) Where a solid bottom cable tray having a usable inside depth of 150 mm (6 in.) or less contains multiconductor control and/or signal cables only, the sum of the cross-sectional areas of all cables at any cross section shall not exceed 40 percent of the interior cross-sectional area of the cable tray.

(b) A depth of 150 mm (6 in.) shall be used to calculate the allowable interior cross-sectional area of any cable tray that has a usable inside depth of more than 150 mm (6 in.).

(f) Ventilated Channel Cable Trays. Where ventilated channel cable trays contain multiconductor cables of any type, the following shall apply:

(1) Where only one multiconductor cable is installed, the cross-sectional area shall not exceed the value specified in Column 1 of Table 392.22 (C).

(2) Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cable shall not exceed the value specified in Column 2 of Table 392.22 (C).

Table 392.22 (C) Allowable Cable Fill Area for Multiconductor Cables in Ventilated Channel Cable Trays for Cables Rated 2000 Volts or Less

<table>
<thead>
<tr>
<th>Inside Width of Cable Tray</th>
<th>Maximum Allowable Fill Area for Multiconductor Cables</th>
<th>Column 1 One Cable</th>
<th>Column 2 More Than One Cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>in.</td>
<td>mm²</td>
<td>m²</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
<td>1500</td>
<td>2.5</td>
</tr>
<tr>
<td>100</td>
<td>4</td>
<td>2500</td>
<td>4.5</td>
</tr>
<tr>
<td>150</td>
<td>6</td>
<td>4500</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Table 392.22 (D) Number of Single-Conductor Cables, Rated 2000 Volts or Less, in Cable Trays.

The number of single-conductor cables, rated 2000 volts or less, permitted in the single cable tray section shall not exceed the requirements of this section. The single conductors, or conductor assemblies, shall be evenly distributed across the cable tray. The conductor sizes herein apply to both aluminum and copper conductors.

(a) Where only one multiconductor cable is installed, the cross-sectional area of any cable tray that has a usable inside depth of more than 150 mm (6 in.).

(b) Where all of the cables are 4/0 AWG or larger, the sum of the diameters of all single conductor cables shall not exceed cable tray width, and the cables shall be installed in a single layer.

(c) Where 4/0 AWG or larger cables are installed in the same cable tray with cables smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables shall not exceed the maximum allowable fill area resulting from the computation in Column 4 of Table 392.22 (C) for the appropriate cable tray width. The 4/0 AWG and larger cables shall be installed in a single layer, and no other cables shall be placed on them.

(d) Solid Bottom Cable Tray — Multiconductor Control and/or Signal Cables (a) Where only one multiconductor cable is installed, the cross-sectional area shall not exceed the value specified in Column 1 of Table 392.22 (C).

(b) Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cable shall not exceed the value specified in Column 2 of Table 392.22 (C).

(f) Solid Channel Cable Trays. Where solid channel cable trays contain multiconductor cables of any type, the following shall apply:

(1) Where only one multiconductor cable is installed, the cross-sectional area of any cable shall not exceed the value specified in Column 1 of Table 392.22 (C).

(2) Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cable shall not exceed the value specified in Column 2 of Table 392.22 (C).

Table 392.22 (D) Allowable Cable Fill Area for Single-Conductor Cables in Ladder or Ventilated Trough Cable Trays for Cables Rated 2000 Volts or Less

<table>
<thead>
<tr>
<th>Inside Width of Cable Tray</th>
<th>Column 1 Applicable for 392.22 (D) (1) (b) Only</th>
<th>Column 2 Applicable for 392.22 (D) (1) (c) Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>in.</td>
<td>mm²</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
<td>1500</td>
</tr>
<tr>
<td>100</td>
<td>4</td>
<td>2500</td>
</tr>
<tr>
<td>150</td>
<td>6</td>
<td>4500</td>
</tr>
</tbody>
</table>

The maximum allowable fill areas in Column 2 shall be calculated. For example, the maximum allowable fill, in mm², for a 150 mm wide cable tray in Column 2 shall be 4200 minus (28 multiplied by Sd) [the maximum allowable fill, in square inches, for a 6-in. wide cable tray in Column 2 shall be 6.5 minus (1.1 multiplied by Sd)].

The term Sd in Column 2 is equal to the sum of the diameters, in mm, of all cables 507 mm² (inches, of all 1000 kcmil) and larger single-conductor cables in the same ladder or ventilated trough cable tray with small cables.
292.6(A) 392.24 Field Bends or Modifications How Made. Field bends or modifications shall be so made that the electrical continuity of the cable tray system and support for the cables is maintained.

292.6(B) 392.28 Smooth Edges. Cable trays shall not have sharp edges, burrs, or projections that could damage the insulation or jackets of the wiring.

292.6(C) 392.30 Supports. A. Cable Supports
(1) Supports shall be provided to prevent stress on cables where they enter raceways or other enclosures from cable tray systems.
(2) B) Fastened Securely. In other than horizontal runs, the cables shall be fastened securely to transverse members of the cable trays.
(4) B) Cable trays shall be supported at intervals in accordance with the installation instructions.
(6) C) 392.66 Raceways, Cables, Boxes, and Conduit Bodies Supported from Cable Tray Systems.
(1) In industrial facilities where conditions of maintenance and supervision ensure that only qualified persons service the installation and where the cable tray systems are designed and installed to support the load, such systems shall be permitted to support raceways and cables, and boxes and conduit bodies covered in 314.1.
(2) For raceways terminating at the tray, a listed cable clamp or adapter shall be used to securely fasten the raceway to the cable tray system. Additional supporting and securing of the raceway shall be in accordance with the requirements of the appropriate raceway article.
(4) For raceways or cables running parallel to and attached to the bottom or side of a cable tray system, fastening and supporting shall be in accordance with the requirements of the appropriate raceway or cable article.
(4) (4) For boxes and conduit bodies attached to the bottom or side of a cable tray system, fastening and supporting shall be in accordance with the requirements of 314.23.

292.5(E) & 392.2 392.40(D) Boxes and Fittings and Covers.
(1) Cable trays shall include fittings or other suitable means for changes in direction and elevation of runs.
(2) Cable trays and associated fittings shall be identified for the intended use.

292.6(D) 392.46 Bushed Conduit and Tubing. A box shall not be required where cables or conductors are installed in bushed conduit and tubing used for support or for protection against physical damage.

292.8(A) 392.56 Cable Splices. Cable splices made and insulated by approved methods shall be permitted to be located within a cable tray, provided they are accessible and do not project above the side rails.

292.60 Grounding and Bonding.

292.7 392.60 (A) Grounding
(A) Metallic Cable Trays. Metallic cable trays that support electrical conductors shall be grounded as required for conductor enclosures in accordance with 250.96.
(B) Steel or Aluminum Cable Tray Systems. Steel or aluminum cable tray systems shall be permitted to be used as equipment grounding conductors, provided that all the following requirements are met:
(1) a The cable tray sections and fittings shall be identified for grounding purposes.
(2) b The minimum cross-sectional area of cable trays shall conform to the requirements in Table 392.7.
(3) c All cable tray sections and fittings shall be legibly and durably marked to show the cross-sectional area of metal in channel cable trays, or cable trays of one-piece construction, and the total cross-sectional area of both side rails for ladder or trough cable trays.
(4) d Cable tray sections, fittings, and connected raceways shall be bonded in accordance with 250.96, using bolted mechanical connectors or bonding jumpers sized and installed in accordance with 250.102.

Table 392.7(B) Table 392.60(A) Metal Area Requirements for Cable Trays Used as Equipment Grounding Conductor

<table>
<thead>
<tr>
<th>Minimum Cross-Sectional Area of Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cs</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>400</td>
</tr>
<tr>
<td>600</td>
</tr>
<tr>
<td>1200</td>
</tr>
<tr>
<td>2000</td>
</tr>
</tbody>
</table>

*(Total cross-sectional area of both side rails for ladder or trough cable trays; or the minimum cross-sectional area of metal in channel cable trays or cable trays of one-piece construction.*

Steel cable trays shall not be used as equipment grounding conductors for circuits with ground-fault protection above 600 amperes. Aluminum cable trays shall not be used as equipment grounding conductors for circuits with ground-fault protection above 2000 amperes.

292.6(A) 392.60(B) Bonding. A bonding jumper sized in accordance with 250.102 shall connect the two sections of cable tray, or the cable tray and the raceway or equipment. Bonding shall be in accordance with 250.96.

292.11 392.80 Ampacity of Cables, Rated 2000 Volts or Less, in Cable Trays.
(A) Multiconductor Cables. The allowable ampacity of multiconductor cables, nominally rated 2000 volts or less, installed according to the requirements of 392.9 shall be as given in Table 310.16 and Table 310.18, subject to the provisions of (1), (2), (3), and 310.15(A)(2).
(1) The derating factors of 310.15(B)(2)(a) shall apply only to multiconductor cables with more than three current-carrying conductors. Derating shall be limited to the number of current-carrying conductors in the cable and not to the number of conductors in the cable tray.
(2) Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid unventilated covers, not over 95 percent of the allowable ampacities of multiconductor cables, the ampacity shall not exceed the allowable ambient temperature-corrected ampacities of multiconductor cables, with not more than three insulated conductors rated 0 through 2000 volts in free air, in accordance with 310.15(C).

FPN: See Table B.310.3.

(B) Single-Conductor Cables. The allowable ampacity of single-conductor cables shall be as permitted by 310.15(A)(2). The derating factors of 310.15(B)(2)(a) shall not apply to the ampacity of cables in cable trays. The ampacity of single-conductor cables, or single conductors cable together (triplexed, quadruplexed, etc.), nominally rated 2000 volts or less, shall comply with the following:
(1) Where installed according to the requirements of 392.10, the ampacities for 600 kcmil and larger single-conductor cables in uncovered cable trays shall not exceed 75 percent of the allowable ampacities in Table 310.17 and Table 310.19. Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid unventilated covers, the ampacities for 600 kcmil and larger cables shall not exceed 70 percent of the allowable ampacities in Table 310.17 and Table 310.19.
(2) Where installed according to the requirements of 392.10, the ampacities for 1/0 AWG through 500 kcmil single-conductor cables in uncovered cable trays shall not exceed 65 percent of the allowable ampacities in Table 310.17 and Table 310.19. Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid unventilated covers, the ampacities for 1/0 AWG through 500 kcmil cables shall not exceed 60 percent of the allowable ampacities in Table 310.17 and Table 310.19.
(3) Where single conductors are installed in a single layer in uncovered cable trays, with a maintained space of not less than one cable diameter between...
individual conductors, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities in Table 310.17 and Table 310.19.

Exception to (B)(3): For solid bottom cable trays the ampacity of single conductor cables shall be determined by 310.15(C).

(4) Where single conductors are installed in a triangular or square configuration in uncovered cable trays, with a maintained free air space of not less than 2.15 times one conductor diameter (2.15 × O.D.) of the largest conductor contained within the configuration and adjacent conductor configurations or cables, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities of the single insulated conductors rated 0 through 2000 volts supported on a messenger in accordance with 310.15(B).

FPN: See Table 310.20.

392.13 392.64(C) Amplitude of Type MV and Type MC Cables (2001 Volts or Over) (1) Cable Trays. The ampacity of cables rated 2001 volts, nominal, or over, installed according to 392.12 392.22(E) shall not exceed the requirements of this section.

(A) Multiconductor Cables (2001 Volts or Over). The allowable ampacity of multiconductor cables shall be as given in Table 310.75 and Table 310.76, subject to the following provisions:

(1) Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid ventilated covers, not more than 95 percent of the allowable amperages of Table 310.75 and Table 310.76 shall be permitted for multiconductor cables.

(2) Where multiconductor cables are installed in a single layer in uncovered cable trays, with maintained spacing of not less than one cable diameter between cables, the ampacity shall not exceed the allowable ampacities of Table 310.71 and Table 310.72.

(B) Single-Conductor Cables (2001 Volts or Over). The ampacity of single-conductor cables, or cables covered together (triplexed, quadruplexed, etc.), shall comply with the following:

(1) The amperages for 1/0 AWG and larger single-conductor cables in uncovered cable trays shall not exceed 75 percent of the allowable amperages in Table 310.69 and Table 310.70. Where the cable trays are covered for more than 1.8 m (6 ft) with solid ventilated covers the amperages for 1/0 AWG and larger single-conductor cables shall not exceed 70 percent of the allowable amperages in Table 310.69 and Table 310.70.

(2) Where single-conductor cables are installed in a single layer in uncovered cable trays, with a maintained space of not less than one cable diameter between individual conductors, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities in Table 310.69 and Table 310.70.

(3) Where single conductors are installed in a triangular or square configuration in uncovered cable trays, with a maintained free air space of not less than 2.15 times the diameter (2.15 × O.D.) of the largest conductor contained within the configuration and adjacent conductor configurations or cables, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable amperages in Table 310.69 and Table 310.70.

III Construction Specifications

392.4 Construction Specifications

392.5 392.100 Construction

(A) Strength and Rigidity. Cable trays shall have suitable strength and rigidity to provide adequate support for all contained wiring.

(B) Side Rails. Cable trays shall have side rails or equivalent structural members.

392.4(C) 392.110 Corrosion Protection. Cable tray systems shall be corrosion resistant. If made of ferrous material, the system shall be protected from corrosion as required by 300.6.

392.116 Nonmetallic Cable Tray. Nonmetallic cable trays shall be made of flame-retardant material.

Revised Article 392 would show as follows:

ARTICLE 392 Cable Tray Systems

I. General

392.1 Scope. This article covers cable tray systems, including ladder, ventilated trough, solid bottom, and other similar structures.


392.2 Definition. Cable Tray System. A unit or assembly of units or sections and associated fittings forming a structural system used to securely fasten or support cables and the system shall provide for the support of the cables in accordance with their corresponding articles.

The system shall provide for the support of the cables in accordance with their corresponding articles.

(E) Where cable trays support individual conductors and where the conductors pass from one cable tray to another, or from a cable tray to raceway(s) or from a cable tray to equipment where the conductors are terminated, the distance between cable trays or between the cable tray and the raceway(s) or the equipment shall not exceed 1.8 m (6 ft). The conductors shall be secured to the cable tray(s) at the transition, and they shall be protected, by guarding or by location, from physical damage.

(F) In all locations the wiring methods in Table 392.10 (F) shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.

Table 392.10 (F) Wiring Methods

<table>
<thead>
<tr>
<th>Wiring Method</th>
<th>Article Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored cable</td>
<td>320</td>
</tr>
<tr>
<td>Communication raceways</td>
<td>800</td>
</tr>
<tr>
<td>Electrical metal conduit</td>
<td>358</td>
</tr>
<tr>
<td>Electrical nonmetallic tubing</td>
<td>362</td>
</tr>
<tr>
<td>Fire alarm cable</td>
<td>760</td>
</tr>
<tr>
<td>Flexible metal conduit</td>
<td>348</td>
</tr>
<tr>
<td>Flexible metallic tubing</td>
<td>360</td>
</tr>
<tr>
<td>Instrumentation tray cable</td>
<td>727</td>
</tr>
<tr>
<td>Intermediate metal conduit</td>
<td>342</td>
</tr>
<tr>
<td>Liquidtight flexible metal conduit</td>
<td>350</td>
</tr>
<tr>
<td>Liquidtight flexible nonmetallic conduit</td>
<td>356</td>
</tr>
<tr>
<td>Metal-clad cable</td>
<td>330</td>
</tr>
<tr>
<td>Mineral-insulated, metal-sheathed cable</td>
<td>332</td>
</tr>
<tr>
<td>Multiconductor service-entrance cable</td>
<td>338</td>
</tr>
<tr>
<td>Multicore underground feeder and branch-circuit cable</td>
<td>340</td>
</tr>
<tr>
<td>Multipurpose and communications cables</td>
<td>800</td>
</tr>
<tr>
<td>Nonmetallic-sheathed cable</td>
<td>334</td>
</tr>
<tr>
<td>Power and control tray cable</td>
<td>336</td>
</tr>
<tr>
<td>Power-limited tray cable</td>
<td>725.61(C) and 725.82(E)</td>
</tr>
<tr>
<td>Optical fiber cables</td>
<td>770</td>
</tr>
<tr>
<td>Optical fiber raceways</td>
<td>770</td>
</tr>
<tr>
<td>Rapid metal conduit</td>
<td>344</td>
</tr>
<tr>
<td>Rapid nonmetallic conduit</td>
<td>352</td>
</tr>
<tr>
<td>Other factory-assembled, multicore control, signal, or power cables that are specifically approved for installation in cable trays.</td>
<td></td>
</tr>
</tbody>
</table>

(G) In Industrial Establishments Only. The wiring methods in Table 392.10 (F) shall be permitted to be used in any industrial establishment under the conditions described in their respective articles. In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installed cable tray system any of the cables in 392.10(G) (1) and (G) (4) shall be permitted to be installed in ladder, ventilated trough, solid bottom, or ventilated channel cable trays.

(1) Single-conductor cable shall be 1/0 AWG or larger and shall be of a type listed and marked on the surface for use in cable trays. Where 1/0 AWG through 4/0 AWG single-conductor cables are installed in ladder cable tray, the maximum allowable rung spacing for the ladder cable tray shall be 225 mm (9 in.).

(2) Welding cables shall comply with the provisions of Article 630, Part IV. (3) Single conductors used as equipment grounding conductors shall be insulated, covered, or bare, and they shall be 4 AWG or larger.

(3) Other factory-assembled, multicore control, signal, or power cables that are specifically approved for installation in cable trays. (4) Medium Voltage. Single- and multicore medium voltage cables shall be Type MV cable. Single conductors shall be installed in accordance with 392.10(G) (1)

(H) Equipment Grounding Conductors. Metallic cable trays shall be permitted to be used as equipment grounding conductors where continuous monitoring, maintenance and supervision ensure that qualified persons service the installed cable tray system and the cable tray complies with provisions of 392.60.

(I) Hazardous (Classified) Locations. Cable trays in hazardous (classified) locations shall contain only the cable types permitted in 501.10, 502.10, 503.20, and 505.15.

(J) Nonmetallic Cable Tray. In addition to the uses permitted elsewhere in 392.10, nonmetallic cable tray shall be permitted in corrosive areas and in areas requiring voltage isolation.

(K) Multiconductor Cables Rated 600 Volts or Less. Multiconductor cables rated 600 volts or less shall be permitted to be installed in the same cable tray. (L) Cables Rated Over 600 Volts. Cables rated over 600 volts and those rated 600 volts or less installed in the same cable tray shall comply with either of the following:

(1) The cables rated over 600 volts are Type MC.

(2) The cables rated over 600 volts are separated from the cables rated 600 volts or less by a solid fixed barrier of a material compatible with the cable tray.

(M) Through Partitions and Walls. Cable trays shall be permitted to extend transversely through partitions and walls or vertically through platforms and floors in wet or dry locations where the installations, complete with installed cables, are made in accordance with the requirements of 300.21.
Table 392.22(C) Allowable Cable Fill Area for Multiconductor Cables in Ladder, Ventilated Trough, or Solid Bottom Cable Trays for Cables Rated 2000 Volts or Less

<table>
<thead>
<tr>
<th>Inside Width of Cable Tray (mm)</th>
<th>Column 1 Applicable for 392.22 (C) (1) (a) Only</th>
<th>Column 2 Applicable for 392.22 (C) (1) (c) Only</th>
<th>Column 3 Applicable for 392.22 (C) (2) (b) Only</th>
<th>Column 4a Applicable for 392.22 (C) (3) (c) Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>575</td>
<td>9.0</td>
<td>6.800</td>
<td>6.800 - (30 Sd)</td>
<td>5.100</td>
</tr>
<tr>
<td>500</td>
<td>12.0</td>
<td>9.000</td>
<td>9.000 - (30 Sd)</td>
<td>5.100</td>
</tr>
<tr>
<td>200</td>
<td>15.0</td>
<td>15.000</td>
<td>15.000 - (30 Sd)</td>
<td>10.000</td>
</tr>
<tr>
<td>18.0</td>
<td>18.0</td>
<td>18.000</td>
<td>18.000 - (30 Sd)</td>
<td>10.000</td>
</tr>
<tr>
<td>30.0</td>
<td>27.0</td>
<td>27.000</td>
<td>27.000 - (30 Sd)</td>
<td>17.000</td>
</tr>
</tbody>
</table>

1 The maximum allowable fill areas in Columns 2 and 4 shall be calculated. For example, the maximum allowable fill in mm² for a 150-mm wide cable tray in Column 2 shall be 4500 minus (30 multiplied by Sd) [the maximum allowable fill, in square inches, for a 6-in. wide cable tray in Column 2 shall be 7 minus (1.2 multiplied by Sd)].

2 The term Sd in Columns 2 and 4 is equal to the sum of the diameters, in mm, of all cables 107.2 mm (in inches, of all 4/0 AWG) and larger multiconductor cables in the same cable tray with smaller cables.
(3) Solid Bottom Cable Trays Containing Any Mixture. Where solid bottom cable trays contain multiconductor power or lighting cables, or any mixture of multiconductor power, lighting, control, and signal cables, the maximum number of cables shall conform to the following:
   (a) Where all of the cables are 4/0 AWG or larger, the sum of the diameters of all cables shall not exceed 90 percent of the cable tray width, and the cables shall be installed in a single layer.
   (b) Where all of the cables are smaller than 4/0 AWG, the sum of the cross sectional areas of all cables shall not exceed the maximum allowable cable fill area in Column 1 of Table 392.22 (C) for the appropriate cable tray width.
   (c) Where 4/0 AWG or larger cables are installed in the same cable tray with cables smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables smaller than 4/0 AWG shall not exceed the maximum allowable fill area resulting from the computation in Column 4 of Table 392.22 (C) for the appropriate cable tray width. The 4/0 AWG and larger cables shall be installed in a single layer, and no other cables shall be placed on them.

(4) Solid Bottom Cable Tray — Multiconductor Control and/or Signal Cables Only.
   (a) Where a solid bottom cable tray having a usable inside depth of 150 mm (6 in.) or less contains multiconductor control and/or signal cables only, the sum of the cross-sectional areas of all cables at any cross section shall not exceed 40 percent of the interior cross-sectional area of the cable tray.
   (b) A depth of 150 mm (6 in.) shall be used to calculate the allowable interior cross-sectional area of any cable tray that has a usable inside depth of more than 150 mm (6 in.).

(5) Ventilated Channel Cable Trays. Where ventilated channel cable trays contain multiconductor cables of any type, the following shall apply:
   (a) Where only one multiconductor cable is installed, the cross-sectional area shall not exceed the value specified in Column 1 of Table 392.22 (C) (5).
   (b) Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cables shall not exceed the value specified in Column 2 of Table 392.22 (C) (5).

(6) Solid Channel Cable Trays. Where solid channel cable trays contain multiconductor cables of any type, the following shall apply:
   (a) Where only one multiconductor cable is installed, the cross-sectional area of the cable shall not exceed the value specified in Column 1 of Table 392.22 (C) (6).
   (b) Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cable shall not exceed the value specified in Column 2 of Table 392.22 (C) (6).

Table 392.22(C)(5) Allowable Cable Fill Area for Multiconductor Cables in Ventilated Channel Cable Trays for Cables Rated 2000 Volts or Less

<table>
<thead>
<tr>
<th>Inside Width of Cable Tray</th>
<th>Maximum Allowable Fill Area for Multiconductor Cables</th>
<th>Column 1 One Cable</th>
<th>Column 2 More Than One Cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>m²</td>
<td>mm²</td>
<td>mm²</td>
</tr>
<tr>
<td>75</td>
<td>1300</td>
<td>2.3</td>
<td>8000</td>
</tr>
<tr>
<td>100</td>
<td>2900</td>
<td>4.5</td>
<td>1600</td>
</tr>
<tr>
<td>150</td>
<td>4500</td>
<td>7.0</td>
<td>2450</td>
</tr>
</tbody>
</table>

The maximum allowable fill areas in Column 2 shall be calculated. For example, the maximum allowable fill, in mm², for a 150 mm wide cable tray in Column 2 shall be 2400 minus (28 multiplied by Sd) [the maximum allowable fill, in square inches, for a 6-in. wide cable tray in Column 2 shall be 6.5 minus (1.1 multiplied by Sd)].

Table 392.22(C)(6) Allowable Cable Fill Area for Multiconductor Cables in Solid Channel Cable Trays for Cables Rated 2000 Volts or Less

<table>
<thead>
<tr>
<th>Inside Width of Cable Tray</th>
<th>Column 1 One Cable</th>
<th>Column 2 More Than One Cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm²</td>
<td>mm²</td>
</tr>
<tr>
<td>50</td>
<td>2500</td>
<td>50</td>
</tr>
<tr>
<td>75</td>
<td>1300</td>
<td>2.0</td>
</tr>
<tr>
<td>100</td>
<td>2400</td>
<td>3.7</td>
</tr>
<tr>
<td>150</td>
<td>6000</td>
<td>5.2</td>
</tr>
</tbody>
</table>

(D) Number of Single-Conductor Cables, Rated 2000 Volts or Less, in Cable Trays.

The number of single-conductor cables, rated 2000 volts or less, permitted in a single cable tray section shall not exceed the requirements of this section. The single conductors, or conductor assemblies, shall be evenly distributed across the cable tray. The conductor sizes herein apply to both aluminum and copper conductors.

(1) Ladder or Ventilated Trough Cable Trays. Where ladder or ventilated trough cable trays contain single-conductor cables, the maximum number of single conductors shall conform to the following:
   (a) Where all of the cables are 1000 kcmil or larger, the sum of the diameters of all single conductor cables shall not exceed cable tray width, and the cables shall be installed in a single layer. Conductors that are bound together to comprise each circuit group shall be permitted to be installed in other than a single layer.
   (b) Where all of the cables are from 250 kcmil up to 1000 kcmil, the sum of the cross-sectional areas of all single-conductor cables shall not exceed the maximum allowable cable fill area in Column 1 of Table 392.22(D) for the appropriate cable tray width.
   (c) Where all kcmil or larger single-conductor cables are installed in the same cable tray with single-conductor cables smaller than 1000 kcmil, the sum of the cross-sectional areas of all cables smaller than 1000 kcmil shall not exceed the maximum allowable fill area resulting from the computation in Column 2 of Table 392.22(D) for the appropriate cable tray width.
   (d) Where any of the single conductor cables are 1/0 through 4/0 AWG, the sum of the diameters of all single conductor cables shall not exceed the cable tray width.

(E) Number of Type MV and Type MC Cables (2001 Volts or Over) in Cable Trays.

The number of cables rated 2001 volts or over permitted in a single cable tray shall not exceed the requirements of this section.

(1) The sum of the diameters of single-conductor and multiconductor cables shall not exceed the cable tray width, and the cables shall be installed in a single layer.
(2) Where single conductor cables are triplexed, quadruplexed, or bound together in circuit groups, the sum of the diameters of the single conductors shall not exceed the cable tray width, and these groups shall be installed in single layer arrangement.

392.24 Field Bends or Modifications. Field bends or modifications shall be so made that the electrical continuity of the cable tray system and support for the cables is maintained.

392.28 Smooth Edges. Cable trays shall not have sharp edges, burrs, or projections that could damage the insulation or jackets of the wiring.


(1) Supports shall be provided to prevent stress on cables where they enter raceways or other enclosures from cable tray systems.

(2) In other than horizontal runs, the cables shall be fastened securely to transverse members of the cable trays.

(3) Cable trays shall be supported at intervals in accordance with the installation instructions.

(C) Raceways, Cables, Boxes, and Conduit Bodies Supported from Cable Tray Systems.

(1) In industrial facilities where conditions of maintenance and supervision ensure that only qualified persons service the installation and where the cable tray systems are designed and installed to support the load, such systems shall
be permitted to support raceways and cables, and boxes and conduit bodies covered in 314.1.

(2) For raceways terminating at the tray, a listed cable tray clamp or adapter shall be used to securely fasten the raceway to the cable tray system. Additional supporting and securing of the raceway shall be in accordance with the requirements of the appropriate raceway article.

(3) For raceways or cables running parallel to and attached to the bottom or side of a cable tray system, fastening and supporting shall be in accordance with the requirements of the appropriate raceway or cable article.

(4) For boxes and conduit bodies attached to the bottom or side of a cable tray system, fastening and supporting shall be in accordance with the requirements of 314.23.

392.40 Fittings and Covers.

(A) Fittings.

(1) Cable trays shall include fittings or other suitable means for changes in direction and elevation of runs.

(2) Cable trays and associated fittings shall be identified for the intended use.

(B) Covers. In portions of runs where additional protection is required, covers or enclosures providing the required protection shall be of a material that is compatible with the cable tray.

-392.46 Bushed Conduit and Tubing. A box shall not be required where cables or conductors are installed in bushed conduit and tubing used for support or for protection against physical damage.

-392.56 Cable Splices. Cable splices made and insulated by approved methods shall be permitted to be located within a cable tray, provided they are accessible and do not project above the side rails.

392.60 Grounding and Bonding.

(A) Grounding.

(1) Metallic Cable Trays. Metallic cable trays that support electrical conductors shall be grounded as required for conduit enclosures in accordance with 250.96.

(2) Steel or Aluminum Cable Tray Systems. Steel or aluminum cable tray systems shall be permitted to be used as equipment grounding conductors, provided that all the following requirements are met:

(a) The cable tray sections and fittings shall be identified for grounding purposes.

(b) The minimum cross-sectional area of cable trays shall conform to the requirements in Table 392.60 (A)

(c) All cable tray sections and fittings shall be legibly and durably marked to show the cross-sectional area of metal in channel cable trays, or cable trays of one-piece construction, and the total cross-sectional area of both side rails for ladder or trough cable trays.

(d) Cable tray sections, fittings, and connected raceways shall be bonded in accordance with 250.96, using bolted mechanical connectors or bonding jumpers sized and installed in accordance with 250.102.

(B) Bonding. A bonding jumper sized in accordance with 250.102 shall connect the two sections of cable tray, or the cable tray and the raceway or equipment. Bonding shall be in accordance with 250.96.

392.80 Ampacity of Cables, Rated 2000 Volts or Less, in Cable Trays.

(A) Multiconductor Cables. The allowable ampacity of multiconductor cables, nominally rated 2000 volts or less, installed according to the requirements of 392.9 shall be as given in Table 310.16 and Table 310.18, subject to the provisions of (1), (2), (3), and 310.15(A)(2).

(1) The derating factors of 310.15(B)(2)(a) shall apply only to multiconductor cables with more than three current-carrying conductors. Derating shall be limited to the number of current-carrying conductors in the cable and not to the number of conductors in the cable tray.

(2) Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid ventilated covers, not over 95 percent of the allowable amperages of Table 310.16 and Table 310.18 shall be permitted for multiconductor cables.

(3) Where multiconductor cables are installed in a single layer in uncovered trays, with a maintained spacing of not less than one cable diameter between cables, the ampacity shall not exceed the allowable ambient temperature-corrected amperages of multiconductor cables, with not more than three insulated conductors rated 0 through 2000 volts in free air, in accordance with 310.15(C).

FPN: See Table B.310.3.

(B) Single-Conductor Cables. The allowable ampacity of single-conductor cables shall be as permitted by 310.15(A)(2). The derating factors of 310.15(B)(2)(a) shall not apply to the ampacity of cables in cable trays. The ampacity of single-conductor cables, or single conductors cabled together (triplaxed, quadruplexed, etc.), nominally rated 2000 volts or less, shall comply with the following:

(1) Where installed according to the requirements of 392.10, the ampacities for 600 kcmil and larger single-conductor cables in uncovered cable trays shall not exceed 75 percent of the allowable amperages in Table 310.17 and Table 310.19.

(2) Where installed according to the requirements of 392.10, the ampacities for 1/0 AWG through 500 kcmil single-conductor cables in uncovered cable trays shall not exceed 65 percent of the allowable amperages in Table 310.17 and Table 310.19. Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid ventilated covers, the ampacities for 600 kcmil and larger cables shall not exceed 70 percent of the allowable amperages in Table 310.17 and Table 310.19.

Table 392.60(A) Metal Area Requirements for Cable Trays Used as Equipment Grounding Conductor

<table>
<thead>
<tr>
<th>Maximum Fuse Ampere Rating, Circuit Breaker Ampere Trip Setting, or Circuit Breaker Protective Relay Ampere Trip Setting for Ground-Fault Protection of Any Cable Circuit in the Cable Tray System</th>
<th>Minimum Cross-Sectional Area of Metal</th>
<th>Minimum Cross-Sectional Area of Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Steel Cable Trays</td>
<td>Aluminum Cable Trays</td>
</tr>
<tr>
<td></td>
<td>mm²</td>
<td>in²</td>
</tr>
<tr>
<td>60</td>
<td>129</td>
<td>0.20</td>
</tr>
<tr>
<td>100</td>
<td>258</td>
<td>0.40</td>
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<tr>
<td>200</td>
<td>451.5</td>
<td>0.70</td>
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<tr>
<td>400</td>
<td>645</td>
<td>1.00</td>
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<tr>
<td>600</td>
<td>967.5</td>
<td>1.50</td>
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<tr>
<td>1000</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1200</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1600</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2000</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

(a) Total cross-sectional area of both side rails for ladder or trough cable trays, or the minimum cross-sectional area of metal in channel cable trays or cable trays of one-piece construction.

Steel cable trays shall not be used as equipment grounding conductors for circuits with ground-fault protection above 600 amperes.

(B) Aluminum cable trays shall not be used as equipment grounding conductors for circuits with ground-fault protection above 2000 amperes.

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(3) Where single conductors are installed in a single layer in uncovered cable trays, with a maintained space of not less than one cable diameter between individual conductors, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities in Table 310.17 and Table 310.19. Exception to (B)(3): For solid bottom cable trays the ampacity of single conductor cables shall be determined by 310.15(C).

(4) Where single conductors are installed in a triangular or square configuration in uncovered cable trays, with a maintained free airspace of not less than 2.15 times one conductor diameter (2.15 × O.D.) of the largest conductor contained within the configuration and adjacent conductor configurations or cables, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities of two or three single insulated conductors rated 0 through 2000 volts supported on a messenger in accordance with 310.15(B).

**FPN:** See Table 310.20.

(C) Ampacity of Type MV and Type MC Cables (2001 Volts or Over) in Cable Trays. The ampacity of cables rated 2001 volts, nominal, or over, installed according to 392.22(E) shall not exceed the requirements of this section.

(1) Multiconductor Cables (2001 Volts or Over). The allowable ampacity of multiconductor cables shall be as given in Table 310.75 and Table 310.76, subject to the following provisions:

(a) Where cable trays are continuously covered for more than 1.8 m (6 ft) with solid unventilated covers, not more than 95 percent of the allowable ampacities of Table 310.75 and Table 310.76 shall be permitted for multiconductor cables.

(b) Where multiconductor cables are installed in a single layer in uncovered cable trays, with maintained spacing of not less than one cable diameter between cables, the ampacity shall not exceed the allowable ampacities of Table 310.71 and Table 310.72.

(2) Single-Conductor Cables (2001 Volts or Over). The ampacity of single-conductor cables, or single conductors cabled together (triplexed, quadraplexed, etc.), shall comply with the following:

(a) The ampacities for 1/0 AWG and larger single-conductor cables in uncovered cable trays shall not exceed 75 percent of the allowable ampacities in Table 310.69 and Table 310.70. Where the cable trays are covered for more than 1.8 m (6 ft) with solid unventilated covers, the ampacities for 1/0 AWG and larger single-conductor cables shall not exceed 70 percent of the allowable ampacities in Table 310.69 and Table 310.70.

(b) Where single-conductor cables are installed in a single layer in uncovered cable trays, with a maintained space of not less than one cable diameter between individual conductors, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities in Table 310.69 and Table 310.70.

(c) Where single conductors are installed in a triangular or square configuration in uncovered cable trays, with a maintained free air space of not less than 2.15 times the diameter (2.15 × O.D.) of the largest conductor contained within the configuration and adjacent conductor configurations or cables, the ampacity of 1/0 AWG and larger cables shall not exceed the allowable ampacities in

III Construction Specifications

392.100 Construction

(A) Strength and Rigidity. Cable trays shall have suitable strength and rigidity to provide adequate support for all contained wiring.

(B) Side Rails. Cable trays shall have side rails or equivalent structural members.

392.110 Corrosion Protection. Cable tray systems shall be corrosion resistant. If made of ferrous material, the system shall be protected from corrosion as required by 300.6.

392.116 Nonmetallic Cable Tray. Nonmetallic cable trays shall be made of flame-retardant material.

Substantiation: As per the TCC to clarify the panel article, Article 392 was reorganized to more closely follow the suggested numbering system established in the NFPA style manual.

This rewrite was completed to format it as closely as possible to the common NFPA style manual.

- Old 392.3 (A) renumbered to 392.10 (A)
- Old 392.3 (A) renumbered to 392.10 (C)
- Old 392.6 (A) renumbered to 392.10 (D)
- Old 392.6 (A) renumbered to 392.10 (E)
- Old 392.7 (A) renumbered to 392.10 (F) and changed table reference to Table 392.6(A) to read Table 392.10 (F). This was an editorial change for adding “In all locations the” and removing “(A) Wiring Methods”
- Old Table 392.3 (A) (6) renumbered to Table 392.10 (F)
- Old 392.3 (B) renumbered to 392.10 (G) “In Industrial Establishments Only”
- Old 392.3 (B), first sentence table reference renumbered to 392.10 (F).
- Old 392.3 (B) second sentence to read “any of the cables in 392.10 (G) (1) to (G) (4)”
- Old 392.3 (B) (1) removed the sentence “(I) Single Conductors. Single-conductor cables shall be permitted to be installed in accordance with (B) (1) (a) through (B) (1) (c) as not needed sub heading.”
- Old 392.3 (B) (1) (A) renumbered to 392.10 (G) (1)
- Old 392.3 (B) (1) (B) renumbered to 392.10 (G) (2)
- Old 392.3 (B) (1) (C) renumbered to 392.10 (G) (3)
- Old 392.3 (B) (2) (d) renumbered to 392.10 (G) (4) and changed reference in article of 392.3 (B) (1) to 392.10 (G) (1)
- Old 392.3 (C) renumbered to 392.10 (H) and the grounding reference is changed from 392.7 to 392.60
- Old 392.3 (D) renumbered to 392.10 (I)
- Old 392.3 (E) renumbered to 392.10 (J)
- Old 392.6 (E) renumbered to 392.10 (K).
- Old 392.6 (F) renumbered to 392.10 (L)
- Old 392.6 (G) renumbered to 392.10 (M)
- Old 392.6 (H) renumbered to 392.10 (N) and change the reference within (N) identified as 392.6(G) renumbered to 392.10 (N)
- Old 392.6 (I) renumbered to 392.10 (O)
- Old 392.4 renumbered to 392.12.
- Old 392.6 “Installation” renumbered to 392.22 with a title of “Conductors and Cables” by adding the word “Multiconductor” that is referenced in the section due to the rewrite and numbering sequence. Change title to read “392.22 Conductors and Multiconductor Cables.”
- Old 392.8 (D) renumbered to 392.22 (A) and the contents within this article subdivided as two separate conditions to read:
  "Where single conductor cables comprising each phase, neutral; or grounded conductor of an alternating-current circuit are connected in parallel as permitted in 310.4, the conductors shall be installed in groups consisting of not more than one conductor per phase, neutral, or grounded conductor to prevent current imbalance in the paralleled conductors due to inductive reactance"
- Old 392.8 conductors shall be securely bound in circuit groups to prevent excessive movement due to fault-current magnetic forces unless single conductors are cabled together, such as triplexed assemblies.
- Old 392.8 (E) renumbered to 392.22 (B)
- Old 392.8 (A) (1) renumbered to 392.22 (C) (1) (a)
- Old 392.9 that was renumbered to 392.22 (C) with subsection (1) (b) to change the existing reference of Column 1 of Table 392.9 changed to Column 1 of Table 392.22 (C).
- Old 392.9 that was renumbered to 392.22 (C) with subsection (1) (c) to change the existing reference of Column 2 of Table 392.9 changed to Column 2 of Table 392.22 (C).
- Old Table 392.9 that was renumbered to Table 392.22 (C) to change the following table references with the table to read as follows:
  Ladder or Ventilated Trough Cable Trays 392.9 (A) renumbered to 392.22 (C) (1) SOLID BOTTOM CABLE TRAYS 392.9 (A) renumbered to 392.22 (C) (3) (1) (a) only
- Column 2 Application for 392.9 (A) (3) renumbered to 392.22 (C) (1) (c) only
- Column 3 Application for 392.9 (C) (2) renumbered to 392.22 (C) (2) (b) only
- Column 4 Application for 392.9 (C) (3) renumbered to 392.22 (C) (2) (c) only
- Old 392.9 (B) changed the section content now numbered 392.22 (C) (2) into parts (a) and (b) to follow previous article format and will read as follows: Where a ladder or ventilated trough cable tray having a usable inside depth of 150 mm (6 in.) or less contains multiconductor control and/or signal cables only, the sum of the cross-sectional areas of all cables at any cross section shall not exceed 50 percent of the interior cross-sectional area of the cable tray. A depth of 150 mm (6 in.) shall be used to calculate the allowable interior cross-sectional area of any cable tray that has a usable inside depth of more than 150 mm (6 in.).
- Old 392.9 (C) (1) renumbered to 392.22 (C) (3) (a)
- Old 392.9 (C) (2) renumbered to 392.22 (C) (3) (b) to update reference Table to new title of Table 392.22 (C).
- Old 392.9 (C) (3) renumbered to 392.22 (C) (3) (c) (e) to update reference Table to new title of Table 392.22 (C).
- Old 392.9 (D) renumbered to 392.22 (C) (4)
- Old 392.9 (D) changed the section content now numbered 392.22 (C) (4) into parts (a) and (b) to follow previous article format and will read as follows:
Cable Tray System. A unit or assembly of units or sections and associated fit-
tings. This article covers cable tray systems, including ladder, ventilated
trough, ventilated channel, solid bottom, and other similar structures.

This change was to correlate with the fitting and covers title line.

From the old 392.8 (C) enumerated as 392.46 “Bushed Conduit and Tubing”

Old 392.8 (A) renumbered as 392.56 “Cable Splices.”

Old 392.8 (C) renumbered as 392.46 “Bushed Conduit and Tubing”

From the old 392.7 Grounding has been renumbered to 392.60 to more
closely follow the NEC numbering sequence. Additionally, the title has been
touched to “Grounding and Bonding” for the title to more accurately describe

The old 392.7 (A) is renamed 392.60 (A) (1) “Metallic Cable Trays”

Old 392.7 (B) is renamed 392.60 (A) (2) “Steel or Aluminum Cable Tray Systems.”

Old 392.7 (B) (1) is renamed 392.60 (A) (2) (a)

Old 392.7 (B) (2) is renamed 392.60 (A) (2) (b) the table reference to

Table 392.7 (B) is renamed to Table 392.60 (A)

Old 392.13 renumbered to 392.80 (C) “Ampacity of Type MV and Type MC
Cables (2001 Volts or Over) in Cable Trays” as a sub title under ampacity.

The old 392.13 first sentence code reference should be renamed from

392.12 to 392.22 (E)

Old 392.13 renumbered as 392.80 (C) (1)

Old 392.13 (A) renumbered as 392.80 (C) (1)

Old 392.13 (A) (1) renumbered as 392.80 (C) (1) (a)

Old 392.13 (A) (2) renumbered as 392.80 (C) (1) (b)

Old 392.13 (B) renumbered as 392.80 (C) (2)

Old 392.13 (B) (1) renumbered as 392.80 (C) (2) (a)

Old 392.13 (B) (2) renumbered as 392.80 (C) (2) (b)

Old 392.13 (B) (3) renumbered as 392.80 (C) (2) (c)

Add Part “III Construction Specifications”

Change the old 392.5 to 392.100 and title as “Construction” to follow the
titles and location assigned to other articles.

Old 392.5 (A) is renamed as 392.100 (A)

Old 392.5 (D) is renamed as 392.100 (B)

Old 392.5 (C) is renamed as 392.110

Old 392.5 (F) is renamed as 392.116

Panel Meeting Action: Hold

Panel Statement: The panel believes that Comment 8-77 introduces material
that has not had public review in accordance with 4.4.6.2.2 of the Regulations
 Governing Committee Projects. In taking this action, the panel wishes to also
place Proposal 8-180 on hold for reconsideration in the next revision cycle.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

8-78 Log #1833 NEC-P08

Final Action: Hold (392)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 8-180

Recommendation: ARTICLE 392 Cable Trays

GENERAL

392.1 Scope

This article covers cable tray systems, including ladder, ventilated trough, ven-
tilated channel, solid bottom, and other similar structures.

Cable trays are mechanical support systems. Cable trays are not raceways. See
the definition of raceway in Article 100.

FPN: For further information on cable trays, see ANSI/NEMA—VE 1-1998,
Metal Cable Tray Systems; NEMA—VE 2-1996, Metal Cable Tray Installation
Guidelines; and NEMA—FG-1998, Nonmetallic Cable Tray Systems.

392.2 Definition

Cable Tray System. A unit or assembly of units or sections and associated fit-
tings forming a structural system used to securely fasten or support cables and
raceways.
INSTALLATION

392.410 Uses Permitted

Cable tray shall be permitted to be used as a support system for service conductors, feeders, branch circuits, communications circuits, control circuits, and signaling circuits.

1. Cable tray installations shall not be limited to industrial establishments.

2. Where exposed to direct rays of the sun, insulated conductors and jacketed cables shall be identified as being sunlight resistant.

3. Cable trays and their associated fittings shall be identified for the intended use.

(A) Wiring Methods The wiring methods in Table 392.410(A) shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.

Table 392.410(A) Wiring Methods

<table>
<thead>
<tr>
<th>Wiring Method</th>
<th>Article Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored cable</td>
<td>320</td>
</tr>
<tr>
<td>Communication raceways</td>
<td>800</td>
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<tr>
<td>Electrical metallic tubing</td>
<td>358</td>
</tr>
<tr>
<td>Electrical nonmetallic tubing</td>
<td>362</td>
</tr>
<tr>
<td>Fire alarm cables</td>
<td>760</td>
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<tr>
<td>Flexible metal conduit</td>
<td>348</td>
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<tr>
<td>Flexible metallic tubing</td>
<td>360</td>
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<tr>
<td>Instrumentation tray cable</td>
<td>727</td>
</tr>
<tr>
<td>Intermediate metal conduit</td>
<td>342</td>
</tr>
<tr>
<td>Liquidtight flexible metal conduit</td>
<td>350</td>
</tr>
<tr>
<td>Liquidtight flexible nonmetallic conduit</td>
<td>356</td>
</tr>
<tr>
<td>Metal-clad cable</td>
<td>330</td>
</tr>
<tr>
<td>Mineral-insulated, metal-sheathed cable</td>
<td>322</td>
</tr>
<tr>
<td>Multiconductor service-entrance cable</td>
<td>338</td>
</tr>
<tr>
<td>Multiconductor underground feeder and branch-circuit cable</td>
<td>340</td>
</tr>
<tr>
<td>Multipurpose and communications cables</td>
<td>800</td>
</tr>
<tr>
<td>Nonmetallic-sheathed cable</td>
<td>334</td>
</tr>
<tr>
<td>Power and control tray cable</td>
<td>336</td>
</tr>
<tr>
<td>Power-limited tray cable</td>
<td>725.61(C) and 725.82(E)</td>
</tr>
<tr>
<td>Optical fiber cables</td>
<td>770</td>
</tr>
<tr>
<td>Optical fiber raceways</td>
<td>770</td>
</tr>
<tr>
<td>Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays</td>
<td>344</td>
</tr>
<tr>
<td>Rigid metal conduit</td>
<td>352</td>
</tr>
<tr>
<td>Rigid nonmetallic conduit</td>
<td>352</td>
</tr>
</tbody>
</table>

(B) In Industrial Establishments The wiring methods in Table 392.410(A) shall be permitted to be used in any industrial establishment under the conditions described in their respective articles. In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installed cable tray system, any of the cables in 392.410(B)(1) and (B)(2) shall be permitted to be installed in ladder, ventilated, solid bottom, or ventilated channel cable trays.

1. Single Conductors Single-conductor cables shall be permitted to be installed in accordance with (B)(1)(a) through (B)(1)(c).

(a) Single-conductor cable shall be 1/0 AWG or larger and shall be of a type listed and marked on the surface for use in cable trays. Where 1/0 AWG through 4/0 AWG single-conductor cables are installed in ladder cable tray, the maximum allowable rung spacing for the ladder cable tray shall be 225 mm (9 in.).

(b) Welding cables shall comply with the provisions of Article 630, Part IV. Cable trays used to support welding cables are required to be dedicated for welding cable installation. See 630.42 for installation details.

(c) Single conductors used as equipment grounding conductors shall be insulated, covered, or bare, and they shall be 4 AWG or larger.

2. (Medium Voltage Single- and multiconductor medium voltage cables shall be Type MV cable. Single conductors shall be installed in accordance with 392.410(B)(1).)

(C) Equipment Grounding Conductors Metallic cable tray shall be permitted to be used as equipment grounding conductors where continuous maintenance and supervision ensure that qualified persons service the installed cable tray system and the cable tray complies with provisions of 392.410(B)(1).

(D) Hazardous (Classified) Locations Cable trays in hazardous (classified) locations shall contain only the cable types permitted in 501.10, 502.10, 503.10, 504.20, and 505.15.

(E) Nonmetallic Cable Tray In addition to the uses permitted elsewhere in 392.410, nonmetallic cable tray shall be permitted in corrosive areas and in areas requiring voltage isolation.

392.412 Uses Not Permitted

1. Cable tray systems shall not be used in hoistways or where subject to severe physical damage.

2. Cable tray systems shall not be used in ducts, plenums, and other air-handling spaces, except as permitted in 300.22, to support wiring methods recognized for use in such spaces.

392.9 22 Cable Tray Conductor Fill (A) Number of Multiconductor Cables, Rated 2000 Volts or Less, in Cable Trays

The number of multiconductor cables, rated 2000 volts or less, permitted in a single cable tray shall not exceed the requirements of this section. The conductor sizes herein apply to both aluminum and copper conductors.

(A)(1) Any Mixture of Cables Where ladder or ventilated trough cable trays contain multiconductor power or lighting cables, or any mixture of multiconductor power, lighting, control, and signal cables, the maximum number of cables shall conform to the following:

1. Where all of the cables are 4/0 AWG or larger, the sum of the diameters of all cables shall not exceed the cable tray width, and the cables shall be installed in a single layer.

2. Where all of the cables are smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables shall not exceed the maximum allowable cable fill area in Column 1 of Table 392.22 for the appropriate cable tray width.

3. Where 4/0 AWG or larger cables are installed in the same cable tray with cables smaller than 4/0 AWG, the sum of the cross-sectional areas of all cables shall not exceed the maximum allowable fill area resulting from the computation in Column 4 of Table 392.22 for the appropriate cable tray width.

(B)(1) Solid Bottom Cable Tray — Multiconductor Control and/or Signal Cables Only.

1. Where a solid bottom cable tray having a usable inside depth of 150 mm (6 in.) or less contains multiconductor control and/or signal cables only, the sum of the cross-sectional areas of all cables at any cross section shall not exceed 40 percent of the interior cross-sectional area of the cable tray.

2. Where 1000 kcmil or larger single-conductor cables are installed in cable tray systems under the conditions described in their respective articles and sections.

3. Cable tray systems shall not be used in ducts, plenums, and other air-handling spaces.

4. Cable tray systems shall not be used in hoistways or where subject to severe physical damage.

5. Unless the sum of the cross-sectional areas of all single conductor cables shall not exceed the maximum allowable cable fill area in Column 1 of Table 392.22 for the appropriate cable tray width.

(F) Solid Channel Cable Trays Where solid channel cable trays contain multiconductor cables of any type, the following shall apply:

1. Where only one multiconductor cable is installed, the cross-sectional area shall not exceed the value specified in Column 1 of Table 392.22(E).

2. Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cables shall not exceed the value specified in Column 2 of Table 392.22(E).

392.22 Cable Tray Conductor Fill Allowable Cable Fill Area for Multiconductor Cables in Ventilated Channel Cable Trays for Cables Rated 2000 Volts or Less

(D) (6) Solid Channel Cable Trays Where solid channel cable trays contain multiconductor cables of any type, the following shall apply:

1. Where only one multiconductor cable is installed, the cross-sectional area of the cable shall not exceed the value specified in Column 1 of Table 392.22(F).

2. Where more than one multiconductor cable is installed, the sum of the cross-sectional area of all cables shall not exceed the value specified in Column 2 of Table 392.22(F).

392.40 (A) Number of Single-Conductor Cables, Rated 2000 Volts or Less, in Cable Trays

The number of single-conductor cables, rated 2000 volts or less, permitted in a single cable tray section shall not exceed the requirements of this section. The single conductors, or conductor assemblies, shall be evenly distributed across the cable tray. The conductor sizes herein apply to both aluminum and copper conductors.

1. (1) Ladder or Ventilated Trough Cable Trays Where ladder or ventilated trough cable trays contain single-conductor cables, the maximum number of single conductors shall conform to the following:

2. Where all of the cables are 1000 kcmil or larger, the sum of the diameters of all single conductor cables shall not exceed cable tray width, and the cables shall be installed in a single layer. Conductors that are bound together to comprise each circuit group shall be permitted to be installed in other than a single layer.

3. (a) Where all of the cables are from 250 kcmil up to 1000 kcmil, the sum of the cross-sectional areas of all single-conductor cables shall not exceed the maximum allowable fill area in Column 1 of Table 392.22(G) for the appropriate cable tray width.

4. (b) Where 1000 kcmil or larger single-conductor cables are installed in the same cable tray with single-conductor cables smaller than 1000 kcmil, the sum of the cross-sectional areas of all cables smaller than 1000 kcmil shall not exceed the maximum allowable fill area resulting from the computation in Column 2 of Table 392.22(G) for the appropriate cable tray width.
Single Conductors

Where any of the single conductors installed in ladder or ventilated trough cable trays are 1/0 through 4/0 AWG, the sum of the diameters of all single conductor cables shall not exceed the cable tray width.

Where any of the single conductors installed in ladder or ventilated trough cable trays are 1/0 through 4/0 AWG, all single conductors shall be installed in a single layer.

Single conductors that are bound together to comprise each circuit group shall be permitted to be installed in other than a single layer.

Grounding

Metallic Cable Trays.

Metallic cable trays that support electrical conductors shall be grounded as required for conductor enclosures in accordance with 250.96.

Section 392.260 (A), together with 250.96, requires all cable tray systems that support electrical conductors (whether mechanically continuous or with individual segments) to be electrically continuous and effectively bonded and grounded. This requirement applies whether or not the cable tray is used as an equipment grounding conductor.

Steel or Aluminum Cable Tray Systems Steel or aluminum cable tray systems shall be permitted to be used as equipment grounding conductors, providing all the following requirements are met:

1. The cable tray sections and fittings shall be identified for grounding purposes.
2. The minimum cross-sectional area of cable trays shall conform to the requirements in Table 392.260 (B).
3. All cable tray sections and fittings shall be legibly and durably marked to show the cross-sectional area of metal in channel cable trays, or cable trays of one-piece construction, and the total cross-sectional area of both side rails for ladder or trough cable trays.
4. Cable tray sections, fittings, and connected raceways shall be bonded in accordance with 250.96, using bolted mechanical connectors or bonding jumpers sized and installed in accordance with 250.102.

Conductor Cables in the same Cable Tray.

Cable trays shall be installed as a complete system.

Field bends or modifications shall be so made that the electrical continuity of the cable tray system and support for the cables is maintained.

Cable trays shall be permitted to have mechanically discontinuous segments between cable tray runs or between cable trays run and equipment. Bonding shall be in accordance with 250.96.

Completed Before Installation. Each run of cable tray shall be completed before the installation of cables.

Supports. Supports shall be provided to prevent stress on cables where they enter raceways or other enclosures from cable tray systems.

Each tray shall be supported at intervals in accordance with the installation instructions and the requirements of 392.260.

Covers. In portions of runs where additional protection is required, covers or enclosures providing the required protection shall be of a material that is compatible with the cable tray.

Multiconductor Cables Rated 600 Volts or Less. Multiconductor cable trays rated 600 volts or less shall be permitted to be installed in the same cable tray.

Cables Rated Over 600 Volts. Cables rated over 600 volts and those rated 600 volts or less installed in the same cable tray shall comply with either of the following:
1. The cables rated over 600 volts are Type MC.
2. The cables rated over 600 volts are separated from the cables rated 600 volts or less by a solid fixed barrier of a material compatible with the cable tray.

Through Partitions and Walls. Cable trays shall be permitted to extend transversely through partitions and walls or vertically through platforms and floors in wet or dry locations where the installations, complete with installed cables, are made in accordance with the requirements of 300.21.

Exposed and Accessible Cable trays shall be exposed and accessible except as permitted by 392.6 (24) (G).

Adoptade Access. Sufficient space shall be provided and maintained about cable trays to permit adequate access for installing and maintaining the cables.

Raceways, Cables, Boxes, and Conduit Bodies Supported from Cable Tray Systems.

In industrial facilities where conditions of maintenance and supervision ensure that only qualified persons service the installation and where the cable tray systems are designed and installed to support the load, such systems shall be permitted to support raceways and cables, and boxes and conduit bodies covered in 314.1.

For raceways terminating at the tray, a listed cable tray clamp or adapter shall be used to connect the raceway to the cable tray system.

Additional supporting and securing of the raceway shall be in accordance with the requirements of the appropriate raceway article.

Fastened Securely. In other than horizontal runs, the cables shall be fastened securely to transverse members of the cable trays.

Cable Installation

Cable Splices. Cable splices made and insulated by approved methods shall be permitted to be located within a cable tray, provided they are accessible and do not project above the side rails.

Blushed Conduit and Tubing A box shall not be required where cables or conductors are installed in bushed conduit and tubing used for support or for protection against physical damage.

Connectors for cable trays shall be determined for the cables in 310.15 (C).

Where single conductor cables comprising each phase, neutral, or grounded conductor of an alternating-current circuit are connected in parallel as permitted in 310.4, the conductors shall be installed in groups consisting of not more than one conductor per phase, neutral, or grounded conductor to prevent current imbalance in the parallelized conductors due to inductive reactance.

Single conductors shall be securely bound in circuit groups to prevent excessive movement due to fault-current magnetic forces unless single conductors are cabled together, such as triplexed assemblies.

FNP: See Table 310.20.
8-80 Log #52 NEC-P08

Final Action: Accept

(Table 392.3(A))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 8-182

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action taken on Proposal 16-181. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 8-77.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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8-81 Log #234 NEC-P08

Final Action: Accept

(Table 392.3(A))

Submitter: Stanley Kaufman, CableSafe Inc.

Comment on Proposal No: 8-181

Recommendation: Accept this proposal.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel action on Comment 8-81.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

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8-82 Log #235 NEC-P08

Final Action: Accept

(Table 392.3(A))

Submitter: Stanley Kaufman, CableSafe Inc.

Comment on Proposal No: 8-182

Recommendation: Accept proposal 8-182 in principle by revising the columns “Wiring Method” and “Article” as shown below.

Table 392.3(A) Wiring Methods

<table>
<thead>
<tr>
<th>Wiring Method</th>
<th>Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored cable</td>
<td>320</td>
</tr>
<tr>
<td>CATV cables</td>
<td>320</td>
</tr>
<tr>
<td>CATV raceways</td>
<td>320</td>
</tr>
<tr>
<td>Liquidtight flexible nonmetallic conduit</td>
<td>356</td>
</tr>
<tr>
<td>Communications cables</td>
<td>800</td>
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<tr>
<td>Communications raceways</td>
<td>800</td>
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<td>Electrical metallic tubing</td>
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<td>Fire alarm cables</td>
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<td>Flexible metal conduit</td>
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<td>Flexible metallic tubing</td>
<td>360</td>
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<td>Instrumentation tray cable</td>
<td>362</td>
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<td>Intermediate metal conduit</td>
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<tr>
<td>Liquidtight flexible metal conduit</td>
<td>362</td>
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<td>Liquidtight flexible nonmetallic conduit</td>
<td>362</td>
</tr>
<tr>
<td>Metal-clad cable</td>
<td>330</td>
</tr>
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<td>Mineral-insulated, metal-sheathed cable</td>
<td>332</td>
</tr>
<tr>
<td>Multiconductor service-entrance cable</td>
<td>458</td>
</tr>
<tr>
<td>Multiconductor underground feeder and branch-circuit cable</td>
<td>540</td>
</tr>
<tr>
<td>Multipurpose and communications cables-</td>
<td>540</td>
</tr>
<tr>
<td>Network-powered broadband communications cables</td>
<td>350</td>
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<tr>
<td>Nonmetallic-sheathed cable</td>
<td>458</td>
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<tr>
<td>Non-power-limited fire alarm cable</td>
<td>760</td>
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<tr>
<td>Power and control tray cable</td>
<td>356</td>
</tr>
<tr>
<td>Power-limited fire alarm cable</td>
<td>760</td>
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<tr>
<td>Power-limited tray cable</td>
<td>760</td>
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<tr>
<td>Optical fiber cables</td>
<td>750</td>
</tr>
<tr>
<td>Optical fiber raceways</td>
<td>750</td>
</tr>
<tr>
<td>Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays</td>
<td>750</td>
</tr>
<tr>
<td>Rigid metal conduit</td>
<td>348</td>
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<tr>
<td>Rigid nonmetallic conduit</td>
<td>352</td>
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<tr>
<td>Signaling raceway</td>
<td>725</td>
</tr>
</tbody>
</table>

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8-79 Log #51 NEC-P08

Final Action: Accept

(392.3 and 392.4)
The panel noted that there were errors in the table. The table in the ROP is missing the title of the left-hand column (Wiring Method) which caused all the items in that column to move up one row. Panel 16 eliminated multipurpose cables in the last code cycle and succeeded in removing most references to multipurpose cables. See my comment on proposal 8-181.

The following cables and raceways should be added to the table in order to make it complete: CATV cables, CATV raceways, Class 2 & 3 cables, signaling raceways and network-powered broadband cables.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-83 Log #236 NEC-P08 Final Action: Accept in Principle (Table 392.3(A))

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 8-182
Recommendation: Revise the columns “Wiring Method” and “Article” as shown below.

<table>
<thead>
<tr>
<th>Wiring Method</th>
<th>Article</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored cable</td>
<td>520</td>
<td>392.3</td>
</tr>
<tr>
<td>CATV cables</td>
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<td>Class 2 &amp; 3 cables</td>
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<tr>
<td>Signaling raceway</td>
<td>222</td>
<td>392.3</td>
</tr>
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</table>

Substantiation: Panel 16 eliminated multipurpose cables in the last code cycle and succeeded in removing most references to multipurpose cables. The following cables and raceways should be added to the table in order to make it complete: CATV cables, CATV raceways, Class 2 & 3 cables, signaling raceways and network-powered broadband cables.

Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 8-81.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

8-86 Log #2158 NEC-P08 Final Action: Accept in Principle (392.8(A))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 8-192a
Recommendation: Proposal 8-192a should be an “Accept in Principle” and revise the text for 392.8(A) to read as follows:
(A) Cable Splices. Cable splices made and insulated by approved methods shall be permitted to be located within a cable tray, provided they are accessible. Splices that are subject to physical damage shall not project above the side rails.

Substantiation: The current text accepted by Panel 8 indicates that the only time a splice is permitted is when it is exposed to physical damage. The proposed rewording in this comment attempts to state that splices are allowed in a cable tray. When the splice is subject to physical damage, the splice cannot project above the side rails of the cable tray.

Panel Meeting Action: Accept
Panel Statement: Revise the text for 392.8(A) to read as follows:
(A) Cable Splices. Cable splices made and insulated by approved methods shall be permitted to be located within a cable tray, provided they are accessible. Splices that are subject to physical damage shall not project above the side rails.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the TCC. See panel action and statement on Comment 7-62.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

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Final Action: Accept

Submitter: Code-Making Panel 5, Comment on Proposal No: 7-105

Recommendation: CMP-5 recommends that CMP-7 reject this proposal.

Substantiation: This proposal adds grounding requirements for the messenger cable that do not correlate with the grounding requirements in other parts of the code as has been pointed out by the negative vote comments. Context indicates that 396.12 has to do with the physical uses of the messenger cable. The submitter’s substantiation does not specifically address the physical use of the messenger cable. A more appropriate place to address grounding requirements for messenger cables is 396.60. Please refer to CMP-5’s comment on Proposal 7-106. This comment has been balloted through CMP-5 with the following results: 15 Eligible to Vote 13 Affirmative 1 Negative 1 Not Returned (W. Helfrich) Mr. D. Brender voted negatively stating: “Vote on Panel 5 and Task Group recommendation is negative. Recommendation: Revise the proposed new 396.12(B) as follows: “The messenger shall not be used as a continuous current-carrying conductor such as a neutral unless otherwise permitted in this code.”

Substantiation: The NEC generally requires conductors to be insulated. The panel considered the recommendations to reject Proposal 7-105. CMP-5 disagrees that 230.41 allows current-carrying conductors to be bare or covered. The exception simply states that other sections in the NEC might allow such an installation. While it is normal practice for the electrical utilities to install service drops using bare neutral conductors, these service drops are not covered by the code given the exclusion in 90.2(B)(5).

Mr. D. Hammel voted affirmatively stating: “Accept the proposal in principle and create a new section for the use of the messenger as a current-carrying conductor as follows: "396.XX Use of Messenger as current-carrying Conductor. The messenger shall only be used as a grounded conductor as provided in 396.XX(A) or (B), (A) Grounded Service Conductor. The messenger shall only be used as a grounded service conductor as provided in 230.22 exception. (B) Grounded Feeder Conductor. The messenger shall only be used as a grounded conductor in accordance with 250.32(B)(2)." Note: If the CMP-5 action on Proposal 5-119 continues to hold through the 2008 NEC development process, the reference to 250.32(B)(2) should be changed to reference 250.32(B)(1) Exception.

CMP-5 agrees with the concepts introduced in this proposal that restricts messengers from being used as current-carrying conductors. By inserting the words “unless used as a grounded conductor in accordance with 250.32(B)(2)" places a restriction on this use while at the same time allows existing installations to continue this use because the installation met previous requirements in the NEC. The actions taken by CMP-5 on Proposal 5-119 will place further restrictions on this use to only existing installations where the conditions of the exception (former 250.32(B)(2)) have been met. CMP-5 recommends that CMP-7 checks the accept action to accept in principle on this proposal and add the text suggested for consistent correlation with the CMP-5 actions on Proposal 5-119. This action should meet the intent of the submitter while continuing to recognize the allowance for messengers to carry current under restrictive existing installations only.

Panel Meeting Action: Accept

The panel accepts the comment and rejects Proposal 7-105. This panel action will delete 396.12(B)(1) as accepted by the panel action on Proposal 7-105, and shown in the ROP, and return 396.12 to the text shown in the 2005 Code.

Panel Statement: The panel considered the recommendations to reject Proposal 7-105 submitted in CMP5 Comment 7-62, CMP4 Comment 7-63 and CMP19 Comment 7-64 and the substantiations and recommendations provided in those comments.

The CMP5 action to accept in principle Proposal 5-119 changed 250.32(B)(2) into an Exception to 250.32(B)(1).

Acceptance of Proposal 7-105 would introduce a conflict with the accept in principle action on Proposals 5-21 and 5-36 to add a definition of “neutral conductor” in Article 100. The Article 100 definition, as modified in Proposal 5-36, states “Neutral Conductor. The conductor connected to the neutral point of a system that is intended to carry current under normal conditions.” Proposal 7-105 recommends the addition of 396.12(B)(2) to read “(B) The messenger shall not be used as a continuous current carrying conductor such as a neutral conductor.” Acceptance of Proposal 7-105 would also introduce a conflict with 310.15(B)(4).

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

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Final Action: Accept

Submitter: Code-Making Panel 4, Comment on Proposal No: 7-105

Recommendation: The following is the Final Action of a task group appointed to review Proposal 7-105. CMP-4 recommends rejecting the proposal.

Substantiation: CMP-4 has rejected Proposal 4-6 to delete permission to use a bare or covered conductor as a grounded circuit conductor. A bare messenger cable conductor from generally being used as a grounded circuit conductor throughout the country for overhead utility company service drops without any problems and is permitted by 230.41, Exception for service entrance conductors. Overhead branch circuits and feeders are permitted to be installed in an outside application where the wires are distributed using overhead poles similar to utility company distribution of service conductors. Section 225.4 only requires installation or covering on branch circuit or feeder cables installed using overhead poles where within 10 ft of any building or structure (structures other than supporting poles or towers). If phase conductors can be uninsulated from pole to pole, it would stand to reason that the grounded conductor could be uninsulated. The evidence is offered that any of the incidents cited by the submitter is or has been corrected by the application of insulated neutrals; no evidence is offered that “Zipps’s Law” has credence or is accepted by any recognized authority; and no evidence is offered that using the messenger as a current-carrying conductor is a hazard.

This comment was balloted through CMP-4 with the following results: 10 Eligible to Vote 10 Affirmative

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 7-62.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

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Final Action: Accept

Submitter: Code-Making Panel 19, Comment on Proposal No: 7-105

Recommendation: The following is the Final Action of a task group appointed to review Proposal 7-105. CMP-19 recommends rejecting this proposal.

Substantiation: CMP-5, not Article 396, should determine grounding requirements including stipulations for the grounded conductor. Based on Proposal 5-119, CMP-5 did not accept the concept of deleting 250.32(B)(2) from the NEC because there are instances where this method of grounding is warranted. They did retain and incorporate the text of 250.32(B)(2) into an exception to the main rule in 250.32(B)(1). CMP-19 agrees with these changes, but points out that they apply to branch circuits and feeders, not services. Proposal 7-105 makes no distinction. Additionally, this new language poses unnecessary restrictions in instances where repairs are needed such as if an entire cable comes down and needs to be replaced.

This comment was balloted through CMP-19 with the following balloting results:

14 Eligible to Vote 12 Affirmative 2 Not Returned (W. Bowman and R. Carlson)

Mr. M. Ewing voted affirmatively stating: “Applying Proposal 7-105 to NEC 396.21(1), (2) and (3) makes sense because these messengers are not intended to be used as a current-carrying conductor. A bare messenger cable with a bare conductor and a separate bare messenger is an acceptable configuration.”

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 7-62.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14
7-65 Log #964 NEC-P07 Final Action: Reject (396.12(B))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 7-105
Recommendation: Revise as follows:

396.12 Uses Not Permitted. (A) Messenger supported wiring shall not be used under the following conditions:

1. In hoistways or
2. Where subject to physical damage
3. Where the messenger shall not be used as a continuous current carrying conductor, such as a neutral conductor.

Substantiation: This proposed change follows the format in other wiring method articles and more closely follows the NEC Style Manual.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-62.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-66 Log #1173 NEC-P07 Final Action: Accept (396.12(B))

Comment on Proposal No: 7-105
Recommendation: Reject Proposal 7-105.
Substantiation: The submitter’s intent is to prohibit the use of the messenger from ever being a current carrying conductor. Sections 250.32(B)(1) and 250.32(B)(2) in the 2005 NEC clearly set forth the rules for when this conductor can be a grounding conductor and when it can be a grounded conductor. Acceptance of this proposal would negate these applicable requirements when this wiring method is used. Article 396 should be used to determine the use, installation, and construction specifications for messenger supported wiring. Article 250 should be used to determine the grounding requirements. No evidence is offered that any of the incidents cited by the submitter is, or has been corrected by the application of insulated neutrals. No evidence is offered that using the messenger as a current carrying conductor is a hazard.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 7-62.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-67 Log #1515 NEC-P07 Final Action: Reject (396.12(B))

Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 7-105
Recommendation: The Panel Action should be to Accept in Principle and instead of adding 396.12(B), revise 396.30 to read as follows.

396.30 Messenger.
(A) Support. The messenger shall be supported at dead ends and at intermediate locations so as to eliminate tension on the conductors. The conductors shall not be permitted to come into contact with the messenger supports or any structural members, walls, or pipes.
(B) Neutral Conductor. Where the messenger is used as a neutral conductor, it shall comply with the requirements of 225.4, 250.184(A), 250.184(B)(7), and 250.186(B).
(C) Equipment Grounding Conductor. Where the messenger is used as an equipment grounding conductor, it shall comply with the requirements of 250.32(B), 250.118, 250.184(B)(8), and 250.186(D).
Substantiation: Requirements already exist in the Code for neutral conductors and equipment grounding conductors. It is not necessary nor appropriate to introduce additional requirements in Article 396 that may conflict with other requirements in the Code that address the concerns of the submitter of the Proposal.
CMP7 has the responsibility to define the construction and installation requirements for Messenger Supported Wiring. CMP5 has adequately defined the specific requirements when the messenger is used as a neutral conductor or an equipment grounding conductor.
Expansion of 396.30 will locate all the requirements related to the application and use of the messenger within one section.
The change in the title of 396.30 was made to be consistent with the new text added into the section. The two sentences in (A) are unchanged from the 2005 Code.
This Comment has been correlated with my comment on Proposal 7-106.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-62.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-68 Log #1684 NEC-P07 Final Action: Reject (396.12(B))

Submitter: Donald W. Zipse, Electrical Forensics, LLC
Comment on Proposal No: 7-105
Recommendation: The Code Making Panel No. 7 is correct and is to be congratulated in accepting the changes made in the messenger section.
Substantiation: I urge Code Making Panel No. 7 to stay with their decision to make the messenger a non-current-carrying conductor.
If Code Making Panel 5 disagrees with your outstanding work, just remember that it took them 21 years to get the electric ranges and dryer wired correctly with 4-wires. I beg you to continue to make this Code electrically correct as you have done in accepting the change to prohibit the messenger from carrying continuous electric current and not to listen to others that lack the knowledge that this Code Panel possesses.
Likewise, since Code Making Panel 19 is having problems understanding stray current, again please disregard them if they are negative on this proposal.
Code Making Panel 19 appears to lack any understanding of Ohm’s Law, so how are they to understand the principles that you have grasped. Keep up the GREAT WORK.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-62.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-69 Log #48 NEC-P07 Final Action: Accept (396.60)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 7-106
Recommendation: The Technical Correlating Committee directs that further consideration be given to the comments expressed in the voting and that this proposal be reconsidered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action on Comment 7-76.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

7-70 Log #286 NEC-P07 Final Action: Accept in Principle (396.60)

Submitter: Code-Making Panel 5,
Comment on Proposal No: 7-106
Recommendation: It is recommended that CMP-7 continue to accept this proposal.
Substantiation: If the CMP-5 action on Proposal 5-119 continues to hold through the 2008 NEC development process, the reference to 250.32(B)(2) should be changed to reference 250.32(B)(1) Exception.
This comment was balloted through CMP-5 with the following balloting results:
15 Eligible to Vote
13 Affirmative
1 Negative
1 Not Returned (W. Helfrich)
Mr. D. Brender voted negatively stating: “Vote on Panel 5 Task Group recommendation is negative.
Recommendation: Reject the proposal.
Substantiation: CMP-5 intends that the practice of grounding the neutral at buildings or structures supplied by a feeder or branch circuit be allowed only where done as provided in editions of the NEC preceding the A2008. As a result, the additional sentence accepted in Proposal 7-106 should not be added.”
Mr. D. Hammel voted affirmatively stating: “It is recommended that CMP-7 reject the suggested changes to this section but accept the proposal in principle and refer to the CMP-7 action and carrying support cabling 7-105.
CMP-5 agrees with the concepts introduced in this proposal that restricts messengers from generally being used as current-carrying conductors but feels that the restrictive text more appropriately belongs in a separate section. By removing the words “only be used as a grounded conductor in accordance with 250.32(B)(2)”, it places a restriction on this use while at the same time allows existing installations to continue this use because the installation met previous requirements in the NEC. The actions taken by CMP-5 on Proposal 5-119 will place further restrictions on this use to only existing installations where the conditions of the exceptions (former 250.32(B)(2) have been met). CMP-5 recommends that CMP-7 adjust the accept action to accept in principle on this proposal and refer to the panel action and statement on Proposal 7-105. This action should meet the intent of the submitter while continuing to recognize
the allowance for messengers to carry current under restrictive existing installations only as currently allowed in 250.32(B)(2)."

Panel Meeting Action: Accept in Principle

The panel accepts in principle the comment by accepting in principle Proposal 7-106.

Panel Statement: The panel agrees with the substantiation to change the reference to 250.32(B)(1) Exception; see panel action on Comment 7-76.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

7-71 Log #298 NEC-P07 Final Action: Accept in Principle (396.60)

Submitter: Code-Making Panel 4,
Comment on Proposal No: 7-106
Recommendation: The following is the Final Action of a task group appointed to review Proposal 7-106. CMP-4 recommends rejecting this proposal.

Substantiation: CMP-4 has rejected Proposal 4-6 to delete permission to use a bare or covered conductor as a grounded circuit conductor. A bare messenger wire is used as the grounded conductor throughout the country for overhead utility company service drops without any problems and is permitted by 230.41, Exception for service entrance conductors. Overhead branch circuits and feeders are permitted to be installed in an outside application where the wires are distributed using overhead poles similar to utility company distribution of service conductors. Section 225.4 only requires insulation or covering on branch circuit or feeder cables installed using overhead poles where within 10 ft of any building or structure (structures other than supporting poles or towers). If phase conductors can be uninsulated from pole to pole it would stand to reason that the grounded conductor could be uninsulated or covered. Service-entrance cable (SE) is an example of a cable where the grounded conductor is only covered, not insulated in accordance 388.10(B)(2) and (B)(4). Section 338.104, last paragraph, permits service entrance (SE) or USE to be constructed with one conductor (the grounded conductor) uninsulated. Accepting this proposal as written, would affect the permission with 338.10(B)(2) and (B)(4), granted for exterior installations of SE cables in not only 225.4, but also in 338.10.

This comment was balloted through CMP-4 with the following results:
10 Eligible to Vote
1 Negative

Mr. J. Young voted negatively stating: "CMP-7 has responsibility for this issue."

Mr. J. Rogers voted affirmatively stating: "I am voting in the affirmative on this comment, however, I do believe that the submitter is correct in his concern that the use of messenger cables as grounded circuit conductors has to be further defined. The exception to 225.4 allows this type of an installation for an outside branch circuit or feeder, but there is no defining language as to where and how. It is my belief that the onus is on CMP-4 to clarify this in the next code cycle and that clarification will be dependent upon some of the actions taken by CMP-5 in this code cycle. I do not believe that the 10 ft exception for energized conductors is intended to apply to grounded or grounding conductors. To reference type SE cable in the Panel statement, could tend to create further confusion as Article 338 would only allow type SE cables to be used in this fashion when they are supported by a messenger cable, thus bringing the uninsulated messenger cable back into the picture."

Panel Meeting Action: Accept in Principle

Panel Statement: The panel did not accept the recommended sentence in Proposal 7-106 but did include in 396.30 references to the applicable sections in the Code when the messenger is used as a neutral conductor or an equipment grounding conductor.

See panel action on Comment 7-76.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

7-72 Log #307 NEC-P07 Final Action: Accept in Principle (396.60)

Submitter: Code-Making Panel 19,
Comment on Proposal No: 7-106
Recommendation: The following is the Final Action of task group appointed to review Proposal 7-106. CMP-19 recommends rejecting this proposal.

Substantiation: Present language in 396.60 requires the messenger in messenger supported wiring to be grounded as required by 250.80 and 250.86 for enclosure grounding. New language in Proposal 7-106 stating that the messenger can only be used as a current carrying conductor if it is a grounded conductor is redundant.

This comment was balloted through CMP-19 with the following balloting results:
14 Eligible to Vote
11 Affirmative
1 Negative
2 NotReturned (W. Bowman and R. Carlson)

Mr. T. McNeive voted negatively stating: "NEMA considers Panel 7 to have jurisdiction."

Panel Meeting Action: Accept in Principle

Panel Statement: The panel did not accept the recommended sentence in Proposal 7-106 but did include in 396.30 references to the applicable sections in the Code when the messenger is used as a neutral conductor or an equipment grounding conductor.

See panel action on Comment 7-76.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

7-73 Log #965 NEC-P07 Final Action: Reject (396.60)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 7-106
Recommendation: Provide proper coordination between this proposal (7-106) and 396.12(B) in proposal 7-105 by adding "except as permitted in 396.60" at the end of 396.12(B) as follows:

396.60 Grounding
The messenger shall be grounded as required by 250.80 and 250.86 for enclosure grounding. The messenger shall not be used as a current-carrying conductor unless used as a grounded conductor in accordance with 250.32(B)(2).

The Panel Action in Proposal 7-105 as follows:

396.12 Uses Not Permitted.

(B) The messenger shall not be used as a continuous current carrying conductor such as a neutral conductor except as permitted in 396.60.

Substantiation: The last sentence in this section (396.60) is in direct conflict with the action to add the following text in 396.12(B) in Proposal 7-105 since a grounded conductor in accordance with 250.32(B)(2) can be a continuous current carrying conductor as prohibited in the new text in 396.12(B).

Panel Meeting Action: Reject

Panel Statement: The submitter's recommendation is no longer valid due to the panel action on Comments 7-76 and 7-62.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

7-74 Log #1175 NEC-P07 Final Action: Accept in Principle (396.60)

Comment on Proposal No: 7-106
Recommendation: Reject Proposal 7-106.

Substantiation: A bare messenger is permitted to be used as a current carrying conductor by the Code for service entrance applications as well as for feeders or branch circuits as allowed in 250.32(B)(2). Section 230.22 allows the grounded conductor of a multi-conductor overhead service drop to be bare. Bare messenger wire is used as the grounded conductor for overhead service drops as permitted by Article 230. Accepting this proposal as written would create a conflict with permission granted for overhead installation of SE cable.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel did not accept the recommended sentence in Proposal 7-106 but did include in 396.30 references to the applicable sections in the Code when the messenger is used as a neutral conductor or an equipment grounding conductor.

See panel action on Comment 7-76.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

7-75 Log #1516 NEC-P07 Final Action: Accept in Principle (396.60)

"TCC Action" The Technical Correlating Committee understands that the panel action on Comment 7-76 removes the sentence added to 396.60 by the panel action on Proposal 7-106 and that this information is now contained in revised 396.30, along with the appropriate references.

Submitter: James Daly, Upp. Saddle River, NJ
Comment on Proposal No: 7-106
Recommendation: The Panel Action should be to Accept in Principle and revise the reference from "250.32(B)(2)" to "250.32(B)(1) Exception".

Substantiation: The change in reference is due to the Panel Action on Proposals 5-76 and 5-119. This reference may have to be changed based on the Panel Action on Comments submitted on Proposal 5-119.

Panel Meeting Action: Accept in Part

The Panel Accepts the change in reference to 250.32(B) and adds (1) to the reference but does not Accept the additional word "Exception."

Panel Statement: The reference should be to 250.32(B)(1), not 250.32(B)(1) Exception since 250.32(B)(1) specifies the size of the equipment grounding conductor and the Exception specifies the applicable conditions of use.

See panel action on Comment 7-76. This panel action will modify the action on Comment 7-70.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

70-242
This Comment has been correlated with my comment on Proposal 7-105. On a 4-wire, 3-phase, wye circuit where the load consists of nonlinear loads, there are harmonic currents present in the line. This proposal tries to reduce the number of splices in an electrical system. The real reason to revisit this proposal has to do with practical utility. When wiring systems break down, they usually do so where conductors are spliced. This proposal tries to reduce the number of splices in an electrical system. The original panel statement on Proposal 6-84 addresses the requirement in Article 400 to begin with, namely, that cord ampacities anticipated operation in unconfined spaces. In fact, if the panel statement were correct, we should establish that the insulation of this limitation was based on entirely erroneous information since the assigned ampacities already anticipated a diminished air circulation. Not true, of course. The panel disagrees with attaching the cord to the structure other than as permitted by other articles in the Code. The Code already requires strain relief for the cord. The panel disagrees with attaching the cord to the structure other than as permitted by other articles in the Code. The Code already requires strain relief for the cord.

ARTICLE 400 — FLEXIBLE CORDS AND CABLES

6-69 Log #417 NEC-P06 (400.8(1)(4)) Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 6-84
Recommendation: Accept proposal revised:
(1) As a substitute for the fixed wiring of a structure methods covered in Chapters 2 and 3. (4) Where attached to buildings or structures surfaces except as permitted in this code.
Substantiation: Fixed wiring is not defined; it may be interpreted as wiring methods covered in Chapters 2 and 3, or “permanent wiring”, although 555.13(A)(2)(1) permits power cables as permanent wiring. The phrase “as permitted in this code” is used in other sections. Structures which are not deemed buildings should be included, such as poles, posts, Fences etc.
Panel Meeting Action: Reject
Panel Statement: The original panel statement on Proposal 6-84 addresses the definition of “Fixed Wiring.” The changes recommended in the comment are already addressed in 400.8 Exception to (4).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-70 Log #1930 NEC-P06 (400.8(4) Exception) Final Action: Reject

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-86
Recommendation: Accept the proposal.
Substantiation: The panel statement overlooks the substantiation that puts this restriction in Article 400 to begin with, namely, that cord ampacities anticipated operation in unconfined spaces. In fact, if the panel statement were correct, we should establish that the insulation of this limitation was based on entirely erroneous information since the assigned ampacities already anticipated a diminished air circulation. Not true, of course. The real reason to revisit this proposal has to do with practical utility. When wiring systems break down, they usually do so where conductors are spliced. This proposal tries to reduce the number of splices in an electrical system. When cord is used at the outer end of control or other circuits to accommodate frequent repositioning, it can be brought back intact to control terminals in an industrial control panel, or it can enter a box for a transition to building wire. Normally avoiding the splices is the better design choice.
Panel Meeting Action: Reject
Panel Statement: The panel disagrees with attaching the cord to the structure other than as permitted by other articles in the Code. The Code already requires strain relief for the cord.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-71 Log #1931 NEC-P06 (400.14) Final Action: Reject

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-88
Recommendation: Accept the proposal.
Substantiation: The panel statement overlooks the substantiation that puts this restriction in Article 400 to begin with, namely, that cord ampacities anticipated operation in unconfined spaces. In fact, if the panel statement were correct, we should establish that the insulation of this limitation was based on entirely erroneous information since the assigned ampacities already anticipated a diminished air circulation. Not true, of course. The real reason to revisit this proposal has to do with practical utility. When wiring systems break down, they usually do so where conductors are spliced. This proposal tries to reduce the number of splices in an electrical system. When cord is used at the outer end of control or other circuits to accommodate frequent repositioning, it can be brought back intact to control terminals in an industrial control panel, or it can enter a box for a transition to building wire. Normally avoiding the splices is the better design choice.
Panel Meeting Action: Reject
Panel Statement: The panel disagrees with attaching the cord to the structure other than as permitted by other articles in the Code. The Code already requires strain relief for the cord.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

ARTICLE 404 — SWITCHES

9-43 Log #2267 NEC-P09 (404) Final Action: Reject

Submitter: Mathew Tarring, Bana Corporation
Comment on Proposal No: 9-82
Recommendation: Revise to read:
Connection points, such as screws on sides of snap switches shall be adequately protected from accidental or inadvertent contact. When installed in areas where they may come in contact with unqualified people or persons.
Substantiation: Although a system is not complete without switch covers, it is inevitable that said covers will be damaged, removed, or discarded at some point. At that time, leaving a safety risk for any unqualified persons. Throughout the code book there are multiple provisions set forth to protect the end user and/or unqualified persons from safety risks.
for the life of the system. I feel adding this text will help take yet another step forward towards an even safer installation. I would also like to site 406.4(F) to further express the need to continue a trend of safety.

Panel Meeting Action: Reject
Panel Statement: The proposal is not properly submitted since it does not identify a specific location in the NEC. The cover plate is required to complete the enclosure and provides an effective level of protection from accidental or inadvertent contact of energized contact points. If the cover plate is removed the circuit is to be de-energized.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-2 Log #60 NEC-P17
Final Action: Accept

404.2(C)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 9-85
Recommendation: It is suggested that the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 17 for Action in Article 422. This action will be considered by Code-Making Panel 17 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the responsibility for Proposal 9-85 but rejects its recommendation. See panel action and statement on Comment 17-3.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 9
Ballot Not Returned: 1 Gill, C.

17-3 Log #904 NEC-P17
Final Action: Reject

404.2(C) (New)

Submitter: John McCamish, Amboy, WA
Comment on Proposal No: 9-85
Recommendation: Add a new subsection (C) to read:
(C) Off indication. A switch with a marked off position shall disconnect all ungrounded conductors to the load it controls.

Substantiation: The submitter provides adequate substantiation and description of an unsafe installation practice that is currently legal. Although the panel statement states that this is a maintenance issue-requiring field marking, Panel 9 covers installation practices. This is an allowable practice due to a loophole in the NEC and needs to be corrected. Marking only allows the installer to continue to violate safe installation practices. The term “OFF” is clear and should be applied in its intended context.

Panel Meeting Action: Reject
Panel Statement: Requirements already exist in 422.34.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 9
Ballot Not Returned: 1 Gill, C.

17-4 Log #1441 NEC-P17
Final Action: Reject

404.2(C)

Submitter: Lawrence Cross, Local Union #98 IBEW
Comment on Proposal No: 9-85
Recommendation: None given.

Substantiation: I agree with Mr. Belisle, R. This is a very unsafe practice. An off position with a switch should be deenergized.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 17-3.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 9
Ballot Not Returned: 1 Gill, C.

9-44 Log #793 NEC-P09
Final Action: Reject

404.2(C) (New)

TCC Action: Based on the Technical Correlating Committee action on Comment 9-44, the Technical Correlating Committee directs that Comment 9-44 be reported as “Reject”.

Submitter: Ian McDonald, Underwriters Laboratories Inc.

Comment on Proposal No: 9-84
Recommendation: Add a new subparagraph 404.2(C) and exception to read as follows:

404.2 Switch Connections.

(C) Switches Controlling Lighting Loads. Where switches control lighting loads supplied by a grounded general purpose branch circuit, a grounded circuit conductor shall be provided at the switch location.

Exception: Grounded conductors shall not be required in installations where it is possible to install conductors into the device boxes without damaging the building structure or building finish.

Substantiation: Acknowledging the ever-increasing use of these devices which need a return path for inbound control circuitry, a step in the right direction would be to add language that limits the new requirement to only those installations where it is impractical to add the grounded conductor at a future date. The reality of such an exception is that, in most installations where a cable wiring method is used, the grounded conductor will be required. This would include the majority of residential applications where the homeowner, unaware of the safety issues related to current flow on the equipment grounding conductor, would have a grounded conductor available at all switch locations which control lighting loads. The exception would have the opposite affect in most commercial applications where raceways are employed and trained electrical workers appreciate the need for a grounded conductor. It is in these applications, due to the presence of a raceway, that the installer has the ability to install the required conductor without damage to the building structure or building finish.

It is important to note that, since the ROP Meeting, proposals to revise the applicable product standards have been unsuccessful. The original substantiation for Proposal 9-83 cited that the UL Standard for Nonindustrial Photoelectric Switches for Lighting Control, ANSI/UL 773A was being revised to require a grounded conductor termination for control current; however, in the recirculation process of the Standards Technical Panel (STP), this decision was reversed and the proposal was rejected. This decision was due in part to a concern from the manufacturers that the Code does not suggest a need for this wiring method at the switch box. Based on the action of this STP, it was determined that similar proposals to other standards would be unsuccessful. As such, an opportunity now exists, for placing language in the Code, which would provide the installer with the means to correctly terminate these devices with a proper return path for the monitoring current.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-47.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:
BREITKREUTZ, B.: This comment should be rejected because it would add a spare conductor for future use.

MCCULLOUGH, R.: See my explanation of negative vote on Comment 9-47.

9-45 Log #819 NEC-P09
Final Action: Reject

404.2(C)

Submitter: Rod Belisle, NECA-IBEW Electrical Training Center
Comment on Proposal No: 9-84
Recommendation: Accepted in principle with the following addition to clarify the scope of the proposal.

Add: In dwelling locations, switches controlling lighting loads supplied by a grounded general purpose branch circuit…

Substantiation: This proposal created a great deal of discussion and concern for the CMP. The proposal has merit and should be required by the NEC in cable wiring methods, where the addition of a grounded conductor is not feasible or practical. The submitter’s proposal is all-inclusive and probably not necessary for commercial and industrial applications, as wiring methods would typically permit the addition of a grounded conductor to those specific modified locations.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-47, which meets the intent of the submitter.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-46 Log #1240 NEC-P09
Final Action: Reject

404.2(C) (New)

Submitter: Rhett Roe, JATC #26 IBEW/NECA
Comment on Proposal No: 9-84
Recommendation: Add new text as follows:

404.2 Switch Connections.

(A) Three-Way and Four-Way Switches. Three-way and four-way switches shall be wired so that all switching is done only in the ungrounded circuit conductor where all circuit conductors are disconnected simultaneously, or where the device is arranged so that the grounded conductor cannot be disconnected until all the ungrounded conductors of the circuit have been disconnected.

(B) Grounded Conductors. A grounded conductor shall be provided in all device boxes to permit connection of switches with a grounded conductor termination.
BREITKREUTZ, B.: This comment should be rejected because it would add an extension would be required to contain the additional conductor, which the raceway wiring would have to be included in order to eliminate any installation problems before and after construction to avoid possible connection to the equipment grounding conductor.

Panel Meeting Action: Reject
Panel Statement:

Substantiation: Although the Code panel feels it is the responsibility of the installer to provide the grounded conductor during construction and the manufacturers of products needing additional grounded conductors to provide appropriate clear and legible warnings and instructions on their products and installation instructions. This proposal should be revisited and recommended to be accepted in order to eliminate any installation problems before and after construction to avoid possible connection to the equipment grounding conductor.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Recommendation: In principle and revise the proposed text as follows: 404.2 Switch Connections.

Panel Meeting Action: Reject
Panel Statement:

Substantiation: NEMA agrees with the comments of panel members that the original proposal has been too broad in requiring a grounded conductor in all installations. The wording of the proposal in this comment is intended to require the grounded conductor in an initial installation only where it is impractical to later install a grounded conductor. For example, a conduit system would permit pulling a grounded conductor into the box after the initial installation whereas, in part, we were told, because a method defined by a finish method clearly, such as NM cable used in a dwelling, may be difficult to retrofit with an additional conductor.

The intent of this proposal is to provide an installation for lighting control products that will not require the use of the grounding conductor for low-level standby current. The requirement of grounding conductor to be installed in all installations would be allowed to migrate from using the grounding conductor to using the grounded conductor for the standby current. Without a code requirement it is unlikely that the present wiring installation practices will change and designers of these products will be forced to continue to rely on the grounding conductor.

Occupancy sensors are permitted by UL 773A to have a current of up to 0.5 mA on the grounding conductor. This is allowed because the operation of an occupancy sensor requires a low level standby current. The standard permits this current of up to 0.5 mA on the grounding conductor because in a typical installation there is no grounded circuit conductor in the switch box which can be used as the return conductor for the standby current. There was a recent proposal to revised UL 773A to delete the section that allows 0.5 mA on the grounding conductor. The UL 773A Standards Technical Panel rejected this change to the standard. Consequently, UL 773A continues to permit 0.5 mA on the grounding conductor.

Products that have ground leakage are not uncommon. There are more than 200 UL listed unit leakage current devices. The use of this requirement will help to eliminate the need for leakage current on the grounding conductor in lighting control devices and other similar products. The design of these products will eventually change to use the grounding conductor for standby current if the code is changed to ensure that the grounded conductor is available or could be easily installed at the switch location.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 6 Negative: 5

EXPLANATION OF NEGATIVE" بناء على نص الصفحة المقدمة، يمكنني قراءة النص بشكل طبيعي كالتالي:

BREITKREUTZ, B.: This comment should be rejected because it would add an extension would be required to contain the additional conductor, which the raceway wiring would have to be included in order to eliminate any installation problems before and after construction to avoid possible connection to the equipment grounding conductor.

Panel Meeting Action: Reject
Panel Statement:

Substantiation: Although the Code panel feels it is the responsibility of the installer to provide the grounded conductor during construction and the manufacturers of products needing additional grounded conductors to provide appropriate clear and legible warnings and instructions on their products and installation instructions. This proposal should be revisited and recommended to be accepted in order to eliminate any installation problems before and after construction to avoid possible connection to the equipment grounding conductor.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Recommendation: In principle and revise the proposed text as follows: 404.2 Switch Connections.

Panel Meeting Action: Reject
Panel Statement:

Substantiation: NEMA agrees with the comments of panel members that the original proposal has been too broad in requiring a grounded conductor in all installations. The wording of the proposal in this comment is intended to require the grounded conductor in an initial installation only where it is impractical to later install a grounded conductor. For example, a conduit system would permit pulling a grounded conductor into the box after the initial installation whereas, in part, we were told, because a method defined by a finish method clearly, such as NM cable used in a dwelling, may be difficult to retrofit with an additional conductor.

The intent of this proposal is to provide an installation for lighting control products that will not require the use of the grounding conductor for low-level standby current. The requirement of grounding conductor to be installed in all installations would be allowed to migrate from using the grounding conductor to using the grounded conductor for the standby current. Without a code requirement it is unlikely that the present wiring installation practices will change and designers of these products will be forced to continue to rely on the grounding conductor.

Occupancy sensors are permitted by UL 773A to have a current of up to 0.5 mA on the grounding conductor. This is allowed because the operation of an occupancy sensor requires a low level standby current. The standard permits this current of up to 0.5 mA on the grounding conductor because in a typical installation there is no grounded circuit conductor in the switch box which can be used as the return conductor for the standby current. There was a recent proposal to revised UL 773A to delete the section that allows 0.5 mA on the grounding conductor. The UL 773A Standards Technical Panel rejected this change to the standard. Consequently, UL 773A continues to permit 0.5 mA on the grounding conductor.

Products that have ground leakage are not uncommon. There are more than 200 UL listed unit leakage current devices. The use of this requirement will help to eliminate the need for leakage current on the grounding conductor in lighting control devices and other similar products. The design of these products will eventually change to use the grounding conductor for standby current if the code is changed to ensure that the grounded conductor is available or could be easily installed at the switch location.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 6 Negative: 5

EXPLANATION OF NEGATIVE" بناء على نص الصفحة المقدمة، يمكنني قراءة النص بشكل طبيعي كالتالي:

BREITKREUTZ, B.: This comment should be rejected because it would add a spare conductor for future use.

HARTWELL, F.: The comment should have been rejected. Although the concept of limiting the requirement to instances where a grounded conductor can be easily installed at later date is a substantial improvement over the original proposal, the exact wording of the exception is just not ready for prime time. Electricians routinely fish new cables into existing openings to address desired changes, and the more skilled among them very often do so without damaging the wall. What level of skill, then, should the AHJ assume while pondering a potential citation? Any time the wiring method uses a cabled wiring method, it could be improper to cite an instance where a wall wired with Type MC cable, but finished on only one side, failed to include a grounded conductor in a switch box. What then about the common commercial applications where the walls are only finished as far up as the suspended ceiling? Any electrician, almost regardless of skill, could replace a two-wire with a three-wire cable in that case. How would that be assessed by an AHJ? What about a box fed with a raceway wiring method, but fully loaded in terms of volume? Some form of extension would be required to contain the additional conductor, which the owner would probably resist in terms of appearance, but no damage to the wall would be required to complete the installation.

Good code is never necessarily code with which one is in technical agreement. It is code that will be consistently applied and understood. This wording does not pass either of those tests. It also does not respond to the presentation at the panel meeting that demonstrated a (to this member) surprising correlation between occupancy type and difficulty in applying the objectives of this comment, with good compliance in residential occupancies and very poor compliance in commercial occupancies. This deserves further study over the next code making cycle.

MCCULLOUGH, R.: This comment should be rejected. Writing code rules based on endless “what if” scenarios is not logical. Trying to come up with rules that cover every possible thing that may be done later is going to result in a book too large to carry and installations too expensive for anybody to afford. The proposed language and the exception would seem to unnecessarily burden the residential and small commercial markets where the buildings are typically wired using cable methods. These installations would more than likely require a grounded conductor be included as part of the original installation at every switch location. It is just not reasonable to assume that an occupancy sensor will replace every switch that controls lighting outlets. Since this is not a retroactive rule, it would be more reasonable to assume that design professionals would include the sensors on their plans taking into account those locations where the may actually be installed and then the grounded conductor would be included as part of the original installation. This way you wouldn’t have to run the grounded conductor to the switch(es) that controls your under cabinet lights, the eyeball spots over your fireplace, the light in your crawl space, the keyless in your furnace room, or lighting accenting wall pictures or other room decor.

The panel’s statement in rejecting (correctly) Proposal 9-84 is still valid and more attention should be paid by the manufacturers to the suggestion for clear warnings and instructions on these types of devices. There was much discussion at both the ROP and ROC meetings about UL 773A which allows 0.5mA on the grounding conductor and proposed changes to that standard. The proposed changes were not accepted in part we were told, because UL 773A didn’t require the grounded conductor at the switch. In my opinion this code doesn’t have to change to require the grounded conductor because 250.6 doesn’t allow for normal operating current to be imposed on the equipment grounding conductor now. Installers and the standards writers need to be aware of 250.6 and take the proper steps to ensure compliance. UL 773A could be changed to delete the allowance for the “standby current” on the grounding conductor, thus, bringing the installation into compliance with the existing rules of the code. This would force the manufacturers of the devices to market them in such a way so as to make it crystal clear to the installers that they have to make provisions for a connection to the grounded conductor of the circuit. 0.5mA doesn’t sound like much, but, think of the cumulative effect in a large building with perhaps hundreds of switch locations and there is considerable current flowing on the equipment ground system. In summary, this is clearly a design issue and the code should not be imposing requirements that may never be utilized.

SENGUPTA, S.: This provision of a grounded circuit as a spare in a switch, controlling lighting loads, will be interpreted as the only code requirement for any future modification. It may be a good idea for a specific purpose and should not be a code requirement without a whole host of issues. It is recognized that this grounded circuit conductor will be used in the future to facilitate a special switching arrangement like a dimmer, sensor, ceiling fan switch or other programmable switch. This conductor is not required for the present switching and will only be required for provision of a circuit for current for future switch modification. So, this spare grounded circuit conductor, required by 2008 NEC, is for convenience of a fast track introduction of a future controlling switch. The future switch may be a safe product, but its installation as a replacement of an existing switch may create a safety hazard, violating other requirements of the NEC. All modifications to any existing installations must take total safety into consideration following all code requirements. This 2008 NEC requirement of a grounded conductor in a switch may give a notion that there are no other code requirements to comply for modification of a switch.

YOUNG, R.: See the Comment on Negative Vote from IEEE (Mr. S. Sengupta).

Comment on Affirmative: RUPP, B.: The intent of this proposal is to provide an installation for lighting control products that will not require the use of the grounding conductor for low-level standby current. If this requirement is adopted the design of these products will be allowed to migrate from using the grounding conductor to using the grounded conductor for the standby current. Without a code requirement it is unlikely that the present wiring installation practices will change and designers of these products will be forced to continue to rely on the grounding conductor. Acceptance of this requirement will help to eliminate the need for leakage current on the grounding conductor in lighting control devices and other similar products. The design of these products will eventually change to use the grounding conductor for standby current if the code is changed to ensure that the grounded conductor is available or could be easily installed at the switch location.
Submission: Richard Shackelford, NEO Products LLC

Comment on Proposal No: 9-91
Recommendation: Revise as follows:

Voltage Between Adjacent Devices. A snap switch shall not be grouped or ganged in enclosures with other snap switches, receptacles, or similar devices unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts, or unless they are installed in enclosures equipped with identified, securely installed barriers or other means listed for the purpose between adjacent devices.

Substantiation: In the response, it was stated that if the devices were individually insulated, the insulation could be left off after a repair was made. Partitions could also be left out after a repair because all partitions sold now are removable. The advantage to an approved insulator on each device is if one device is replaced and left unprotected the other device insulator will still provide the separation. Another situation that occurs during building renovations is when lighting systems are changed from 120 volts to 277 volts using the existing conduits and boxes, the boxes are not always designed for partitions but an individual approved insulator would solve the problem. There have been numerous complaints from electricians (since the code requires the grounding of switches) that the bare ground wire of Romex is causing short circuiting. To use some approved means to insulate the devices would also solve this problem.

An insulating band is currently going through the UL approval process. This insulator has received raving reviews from twelve electrical inspectors, four chief inspectors, and three fire chiefs.

Letters of approval are available upon request.

Panel Meeting Action: Reject

Panel Statement: The barriers that are the focus of this section are independent of the switch. The barrier needs to be part of the enclosure and stay with the enclosure and not with the device.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-49 Log #1238 NEC-P09 Final Action: Accept

(404.9(B))

Submission: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 9-18
Recommendation: Accept CMP-9’s Panel actions on 404.9(B) in Proposal 9-18.

Substantiation: The NEC/TCG Task Group on Grounding and Bonding notes Proposal 9-93 was “Accept in Principle, see Panel action on Proposal 9-18.” As a result, the Panel action on Proposal 9-93 did not modify the Panel action on Proposal 9-18 as indicated in the Comment on the Panel votes. Refer to companion comment on Proposal 9-94.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-50 Log #1245 NEC-P09 Final Action: Accept

(404.9(B))

Submission: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 9-94
Recommendation: Continue to accept the Panel action on Proposal 9-94.

Substantiation: The TCC Task Group on Grounding and Bonding agrees with the Panel action to accept Proposal 9-94 in Principle and with the changes made to 404.9(B) in Proposal 9-18.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-51 Log #2101 NEC-P09 Final Action: Reject

(404.9(B))

Submission: Brent Kidman, Cheetah usa Corp., Dale C. Gledhill

Comment on Proposal No: 9-18
Recommendation: Wording below is from the 2008 draft. Because of changes to identification that switch shall be connected to an equipment grounding conductor, the additional wording telling how to do that is not needed, so it is being proposed to be removed. In addition, where there is no likelihood of shock, the exception should include those situations.

(B) Grounding. Snap switches, including dimmer and similar control switches, shall be connected to an equipment grounding conductor and shall provide a means to connect metal faceplates to the equipment grounding conductor, whether or not a metal faceplate is installed. Snap switches shall be considered to be at no effective ground fault current path if either of the following conditions is met [ROP 9-18]

(1) The switch is mounted with metal screws to a metal box or metal cover that is connected to an equipment grounding conductor. (A) Grounding. Snap switches, including dimmer and similar control switches, shall be connected to an equipment grounding conductor and shall provide a means to connect metal faceplates to the equipment grounding conductor, whether or not a metal faceplate is installed. Snap switches shall be considered to be at no effective ground fault current path if either of the following conditions is met [ROP 9-18]

An insulator band is going through the UL approval process. This insulator has received raving reviews from twelve electrical inspectors, four chief inspectors, and three fire chiefs.

Letters of approval are available upon request.

Panel Meeting Action: Reject

Panel Statement: The comment would eliminate necessary provisions that cover the characteristics of an acceptable equipment grounding return path with respect to snap switch yokes and metal faceplates. Those requirements exist in part because the exchanges of a nonmetallic faceplate for a metallic one will not, as a general rule, be supervised by qualified persons. There is no need for the additional wording in “Exception to (B)” since the existing requirement allows a plastic switch and cover plate to be installed.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-52 Log #820 NEC-P09 Final Action: Reject

(404.9(B)(1))

Submission: Rod Belisle, NECA-IBEW Electrical Training Center

Comment on Proposal No: 9-95
Recommendation: “Accept” to read as follows: Revise 404.9(B)(1) as follows: “The switch is mounted with metal screws to a surface-mounted metal box with at least one of the insulating washers removed or to a nonmetallic box with integral means for grounding devices.

Substantiation: The requirements in 404.9(B) state that a switch shall be “effectively grounded” The definition of effectively grounded in Article 100, states that it shall be sufficiently low impedance and have sufficient current carrying capacity to prevent the buildup of voltages that may result... It is not accurate to state that a switch mounted on a non-conductive surface, secured to a metal box that is recessed “”, therefore not touching the switch, meets the requirements of “Effectively grounded”. The CMP substantiated it’s vote by stating that the requirement is not the same as the requirement for receptacles, but the terminology used in 404.9(B) does not differentiate for the code user.

The use of the term “effectively grounded” needs to mean the same thing as used throughout the NEC, as it is described in Article 100.

Panel Meeting Action: Reject

Panel Statement: The proposed requirement is the same as 250.146(A) for receptacles and as such is not necessary for snap switches that do not have an internal means for connecting to an equipment grounding conductor. [ROP 9-26]

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Installation of a bonding jumper from the box to the device is a small request. BELISLE, R.: The panel should have accepted the comment and rejected the grounding. It is a poor practice and certainly does not provide a safe installation or working environment.

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Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:
BELISLE, R.: The panel should have accepted the comment and rejected the original proposal. Allowing switches mounted in raised industrial covers to be grounded via the cover, therefore, exposing the electrician to a shock hazard when mounting screws become loose, the cover is removed to service the device, take test measurements, or other activities OSHA would allow while the circuit is disconnected. Installation of a bonding jumper from the box to the device is a small request in exchange for a safe installation. The CMP needs to be reminded of the purpose of the NEC as described in 90.1.

Panel Meeting Action: Reject
Panel Statement: Refer to the panel statement on Comment 9-52. In addition, safe work on the energized terminals of a snap switch must involve other work procedures beyond the continuity of the equipment grounding return path in this instance. In fact, if there were a fault in the switch, and the enclosure and device were wired in accordance with the 2005 NEC, the circuit would have opened long before the electrician went to work on the box.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:
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These primary causes of fires from electrical faults are outlined in three primary reference documents used in the fire investigation industry. These documents include the following:

- **“Fire Ignition,”** Dr. Vyto Babrauskas, Fire Science Publishers, 2003
- **Chapter 10 “Electrical Causes of Fire”** by Chris Korinek, P.E.
- **“Guide to Fire and Explosion Investigations,”** NFPA 921

Additionally, 2D2C, Inc. has invented complimentary shock safety devices to prevent electrical faults caused by overheated receptacle contacts or terminals. Now the claim is that the products can prevent fires. To support a thermally protected receptacle indicating that the incidents resulted from overheated receptacle contacts or terminals. The technology works.

**NOTE:** PFCl and OFCl will prevent fires that presently occur in the presence of circuit breaker, AFCI and GFCI protection. The PFCl and OFCl protection is needed in a structural wiring system - protection does not presently exist for these faults. PFCl will prevent the super-heating of loose wire junctions inside wire nuts and screw connections that cause fires. PFCl will also protect against voltages up to 200-220 VAC across 120 VAC rated electrical devices caused by “floating neutral” conditions. OFCl will prevent against excess current heating in the small wires (18, 20, 22, 24 gauge) inside electrical devices caused by poor maintenance, damage, abuse, improper designs, and poor quality manufacturing. OFCl also limits current through each 120 VAC outlet to a cumulative maximum of 15 amps or (as rated for the outlet type) to prevent distribution wiring from overheating due to overloads allowed by improper size fuse or circuit breaker replacement (presently the company has not completed the designs for a 20A outlets - only 15A versions exist at the time of this writing).

Additionally, 2D2C, Inc. has invented complimentary shock safety technology to the Ground Fault Circuit Interrupter (GFCI). The GFCI prevents electrocutions from line-to-ground leakage paths. The Shock Fault Circuit Interrupter (SFCI) prevents shocks through the normal line-to-line paths. To accomplish this, the SFCI keeps electricity off at unused receptacles and only delivers electricity to tagged electrical plugs.

Please approve proposals 18-11, 18-12, and 18-13. Make this technology part of the 2008 Code. If the PFCl and OFCl technology had been installed in homes in our community where I serve as Fire Marshal, a number of fires would never have started. Please help me to save lives by requiring the use of PFCl and OFCl in the electrical outlets in residential wiring systems.

**Panel Meeting Action:** Rejected

**Final Action:** Rejected

**Ballot Results:** Affirmative: 12

18-4 Log #f1614 NEC-P18  
406.2 (New)  

**Submitter:** Steve Montgomery, OFI Inc.

**Comment on Proposal No:** 18-13

**Recommends:** Add new text to read as follows:

All 125-volt single phase receptacles electrical faults� Fault Circuit Interrupter protection.

**Substantiation:** Thank you for considering the Overload Fault Circuit Interrupter (OFCl) located in an electrical outlet for fire protection of structures. In these comments, I have tried to respond to your concerns as stated:

1) The submitter’s use of the term “should not” could be interpreted as not being mandatory language and may not satisfy the submitter’s original intent.

2) The surveys of other installations are the result of arcing faults on the interior wiring. The last code cycle, this data was used to support a thermally protected receptacle indicating that the incidents resulted from overheated receptacle contacts or terminals. Now the claim is that the incidents are resulting from electrical overload of connected utilization.

3) This appears to be a proposal that would recommend a “theoretical” product. CMP 18 is not aware of any such product on the market. Nor is CMP 18 aware of any standards or fact finding report covering such a product. Before considering a proposal such as this, CMP 18 would look for information from a standard or fact finding report dealing with performance characteristics such as (but not limited to) the following:

- Endurance
- Current to withstand overload and short circuit
- Ability to operate in normal and abnormal temperature ranges
- Ability to withstand surges
- Ability to withstand under-voltages
- Ability to withstand moisture/corrosive atmosphere

My comments are as follows:

1) Change the wording in Proposal 18-11 and 18-12 to match the Proposal 18-13 as follows:

“All receptacles shall incorporate Overload Fault Circuit Interrupter protection."

2) I would like the OFCI accurately state what percentage of electrically-ignited fires would have been prevented by the use of OFCI. It is impossible for anyone without the forensic evidence to accurately analyze the fire examples listed in Proposal 18-13. However, the OFCI covers many of the previous gaps in electrical fire protection.

As I am sure you know, the surveys that the NFPA conducts are mostly based upon Fire Marshal Reports. I am a member of the International Fire Marshals Association (IFMA) and have spoken to a number of Fire Marshals about the level of detail regarding their investigations. In addition to the fact that only about a third of the big fires leave enough evidence to trace back to the original source of the fire, some of them have been to fires where the products are not available to identify the specific cause. It is often an accomplishment for anyone to determine that an electrical fault, versus another ignition source, generated the fire, let alone what type of electrical fault caused it. The insurance company fire investigator gets more detail on cause, since they must try to find out whether a product manufacturer to assign the insurance payout burden away from the insurance company. But the product liability defense forensic expert, hired to prove the product manufacturer to be innocent, is the one with the best knowledge. He understands electricity very well, replicates ignition situations in his/her lab, and even X-rays burns electrical components (appliances, circuit breakers, etc.) to identify internal states to prove cause. Only these electrical forensic experts know the detailed fire cause facts, but rarely can they share them since the evidence is associated with a court case or simply held as confidential by the electrical appliance or device manufacturer.

To identify how many of electrically ignited fires would be prevented by OFCI, we interviewed several of these expert forensic electrical fire investigators including the following persons:

- Jon Finneman, ElectroTek Consultants Inc., 18925 SR 1, Spencerville, IN 46788, fire researcher, electrical forensic investigator, expert witness, co-author of “Fire Findings.”
- John S. Robison, Robison Consulting LLC, PO Box 680854, Prattville, AL 36068-0854, electrical forensic investigator, expert witness, ex Fire Marshal.

The general consensus is that only about a third of the big fires leave enough evidence to trace back to the original source of the fire. Third, would never have started. Please help me to save lives by requiring the use of PFCl and OFCl in the electrical outlets in residential wiring systems.

**Panel Meeting Action:** Rejected

**Final Action:** Rejected

**Ballot Results:** Affirmative: 12

18-4 Log #f1614 NEC-P18  
406.2 (New)  

**Submitter:** Steve Montgomery, OFI Inc.
High resistance connections

2. As a Fire Chief, I cannot provide an absolute analysis of fire data. Most of the data is collected from Fire Marshals and Fire Prevention Officers, not fire investigators, and few fire departments have forensic equipment or the resources to perform detailed analysis.

Additionally, the number of fires that occur each year in each fire department is not comprehensive, but they address several of the primary fault causes including:

- Inadequate voltage
- Overheating connections
- Poor wire connections at the outlet or inside the electrical box
- Poor connections at the power source

I first became aware of these product solutions in May 2005 at the Ontario Fire Chief Association meeting. 2D2C, Inc. has a product line called SafePlug electrical safety outlets that implement these products. I do not know if other companies are also making the product. Their research and development facility is located in Waterloo, Ontario, Canada and their corporate headquarters are in Gurnee Illinois. The leader of the Canadian operation is Steve Montgomery. He would be better prepared to provide the evidence of product performance characteristics and reliability than I would. I have requested that he provide this evidence directly to you.

Based upon my experience as a Fire Chief, I truly believe that this Overload and Power Fault Circuit Interrupter technology implemented either in new structure or retrofitted into existing structure electrical outlets would reduce the number of fires. Please require them in the 2008 NEC.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-4.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-5 Log #1621 NEC-P18 Final Action: Reject (406.2 (New) )

Submitter: Scott Tegler, City of Woodstock / Rep. Fire Department City of Woodstock

Comment on Proposal No: 18-13
Recommendation: All 125-volt single-phase 15- and 20-ampere receptacles shall have Overload Fault Circuit Interrupter and Power Fault Circuit Interrupter protection.

Substantiation: I do not have the information that you request to make a decision on this proposal. Nevertheless, since I proposed this code change, I am responding to your request for comments.

1. My proposal did comply with NFPA Regulations Governing Committee Projects and the NEC Manual of Style. I used the word “shall” and not “should”.

2. As a Fire Chief, I cannot provide an absolute analysis of fire data. Most of the data is collected from Fire Marshals and Fire Prevention Officers, not fire investigators, and few fire departments have forensic equipment or the resources to perform detailed analysis.

I presently act as an expert investigator for fire cause and am a retired fire marshal. As such, I have personal experience with identifying the cause of thousands of fires. On several occasions, the use of light bulbs of a higher rating than the fixture in which they were used has resulted in fires. The NFPA 101 Life Safety Code requires apartment building owners to provide annual information to tenants regarding safety procedures in the event of fire or the sounding of a fire alarm. I believe a portion of that information should include the maximum current draw rate of light fixtures. Unfortunately, this safety practice does not normally occur nor is it practical to regulate. OFCI is a practical solution to this fire cause.

Some examples of fires that OFCI would have prevented include the following:

A fatal apartment house fire where 100 watt bulbs were routinely installed in both interior and exterior fixtures, although the fixtures carry warnings regarding the use of bulbs in excess of 60 watts.

Several interior lamp fires where bulbs in excess of 60 watts were used overheating combustible shades.

Report on Comments A2007 — Copyright, NFPA
Warnings regarding this improper practice of over-sizing bulbs in fixtures and lamps are displayed on websites of nationally recognized safety organizations, however, the practice continues and fires do likewise.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-4.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

18-8 Log #306 NEC-P18 (406.3(G) (New)) Final Action: Reject

Submitter: Earl W. Roberts, Reptec

Comment on Proposal No: 18-15

Recommendation: Add new section 406.3(G), “Receptacle Testing”, as follows:

“This exception creates a direct conflict with other parts of the NEC and nationally recognized standards and can create an unsafe condition by permitting access to live parts in the outlet box. The NEC has installation requirements that support both of these safety objectives.

NEC 406.4(D) requires “After installation, receptacle faces shall be flush with or project from faceplates of insulating material and shall project a minimum of 0.4 mm (0.015 in.) from metal faceplates."

Article 406.5 requires “Receptacles faceplates shall be installed so as to completely cover the opening and seat against the mounting surface”. Clearly there has been a comprehensive and collaborative set of codes and standards requirements that recognize these relationships and work together to establish a safe environment.

NEC 406.5 Exception No. 1 recognizes this important relationship.

It permits “Listed kits or assemblies encompassing receptacles and nonmetallic faceplates that cover the receptacle face, where the plate cannot be installed on any other receptacle...”. This is a very reasonable exception. It permits a specific receptacle and faceplate to be tested, evaluated and listed for the purpose.

It also acknowledges the fact that it is not possible to determine if the face plate will function safely with the billions of other receptacle installations, produced or being designed and, thus, requires it to be non-interchangeable. NEC 406.5 Exception No. 2 looks this important relationship.

It universally permits “Listed nonmetallic faceplates that cover the receptacle face to a maximum thickness of 1 mm (.040 in.)...”. This exception in effect arbitrarily reduces the plug engagement on any receptacle where it is installed.

This would be the same as the NFPA allowing an exception for all plug blades to be 1 mm (.040 in.) shorter than the minimum length published in the ANSI standards.

There are several safety issues involved:

1. The typical duplex receptacle is designed to mount to an outlet box installed in a wall and the electrical enclosure is completed by the installation of a faceplate. To do this, it must seat on the surface of the wall. A faceplate as described in Exception No. 2 that covers the receptacle face must also seat on the receptacle face. It will only seat against the wall if its dimensions match the receptacle face height exactly. There are millions of receptacles being produced and installed that have a face height significantly higher than the minimum specified in ANSI/NEMA WD6. If the plate is designed to the minimum face height dimension, then it will not seat against the wall with these receptacles. This is a direct violation of NEC 406.5 cited previously and creates a potential safety hazard by permitting access to live parts in the outlet box.

2. If the plate is designed to be greater than the minimum face height dimension, in order to seat against the wall, then it may not seat against the face of the receptacle creating a gap between the plate and receptacle face precluding the full insertion of a plug even further. This can create an arcing path and potential for fire with any receptacle. This exception, if adopted, would be deeply recessed. The billions of installed receptacles have widely varying contact recesses as they are designed to work with a minimum length of plug blade.

3. Even if the receptacle and the plate are perfectly matched, the installation must also be perfect. If the receptacle is slightly raised, it will lift the plate off the wall. If the receptacle is slightly recessed it will result in a gap between the plate and receptacle resulting in far more than a .040 in. obstruction.

4. By its very nature this type of plate can be used to cover an improper receptacle or be used over an old worn or broken receptacle. The finished installation will look perfect while actually concealing the hazard. The TayMac code panel presentation cites a fact-finding to justify the exception. The test program is seriously flawed, as it does not follow the standard test protocols in the suitable ANSI/NEMA standards. However, even if corrected it would still be irrelevant as it cannot test or anticipate the wide variety of receptacle designs and installation conditions that can create the safety issues cited above. It can only demonstrate, at best, that it can work while it can work. There are many receptacle designs where the plate will not work safely because the plate will not seat on the wall or the plug engagement is significantly compromised.

This is a dimensional compatibility issue, not just a performance issue. Clearly, Exception No. 1 was intended to address this issue by allowing a National Recognition Testing Laboratory (NRTL) to evaluate and list nonmetallic faceplates that cover the receptacle face for use with specific receptacles and cannot be installed on non-tested receptacles. This in effect acknowledges that it is not possible to test or evaluate the face plate with the billions of other receptacles already installed, being produced or being designed.
Another issue raised is that 406.4(D) Exception No. 2 violates language that a cover plate or outlet box hood that is used with a receptacle shall not hinder the complete seating of an attachment plug of the type, intended for use with any receptacle will not produce a safety hazard. Panel members rely on dimensional compatibility issue of assuring that a cover plate when used with any receptacle will not produce a safety hazard. The demonstration in the meeting was very convincing, but was it an accurate representation of a test in UL498? (Note the Masque wallplate was held against the receptacle to make proper contact with the blades of a cord cap. The single receptacle that was used in the demonstration is no longer produced in the same configuration according to a representative of the manufacturer. The single receptacle could not be used over unsafe receptacles or improperly installed receptacles. The issue addressed from this side really is a case of an installation that is in violation of other sections of the NEC by the receptacle not being maintained in a serviceable condition or not installed with the plaster ears against the wall surface. This is similar to stating that a surface-mounted fluorescent luminaires should not be allowed because of the box: the box was not installed in a code compliant manner. The correction action is to require proper installation of the receptacle and not preclude the installation of the plate. The only operative issue that was presented concerns the ability of a receptacle to make proper contact with the blades of a cord cap. The single receptacle that was used in the demonstration is no longer produced in the same configuration according to a representative of the manufacturer. The panel does not support this proposal based upon the comments expressed in the voting. The revision does not always correspond to the revision cycles of UL or NEMA standards. Allowance is always made for other standards to catch up. For example, take the proposed new requirement for weather-resistance receptacles in damp and wet locations. At the time the original proposal was made the current standards did not have requirements covering weather-resistant type receptacles. During this comment stage, statements were made that the standards are in the process of being revised and new listed devices should be available upon code implementation. Finally, both standards do allow cover plates that cover a receptacle specifically in the floor mounted receptacles. In conclusion, I did not see any presentation that an otherwise code compliant installation is designated by 406.4(D) Exception No. 2 or that existing standards could be modified to allow these coverplates under specified conditions and with appropriate installation instructions and restrictions.

Panel Meeting Action: Reject

18-10 Log #1607 NEC-P18  Final Action: Reject

(406.4(D) Exception No. 2)

Submitter: Robert W. Miller, Taymac, Inc.

Comment on Proposal No: 18-19

Recommendation: Continue to reject the proposal.

Substantiation: The substantiation for the proposal provides no evidence of field problems, although products meeting the provisions of the exception have been sold for over ten years, with millions of installations. Additional substantiation requested by some members of CMP-18 to retain the current wording is contained in the report provided.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: The panel does not support this proposal based upon the dimensional compatibility issue of assuring that a cover plate will not produce a safety hazard. Panel members rely on technical facts and not on the basis of the number of unreported field problems or a series of tests that do not encompass the entire range of available products to justify continued acceptance. It is clearly evident that ANSI/NEMA WD6 standard contains the critical dimensional requirements to assure the safe usage of a receptacle and an attachment plug regardless of whom and where each is individually produced. The ANSI/UL 514D Standard, which states that a cover plate or outlet box hood that is used with a receptacle shall not hinder the complete seating of an attachment plug of the type, intended for use with the receptacle. The submitter has not demonstrated that the unimpeded plug insertion has been addressed as well as assured compliance with 406.5 regarding the seating of the faceplate against the wall surface. The panel urges the submitter to continue to address this issue through the ANSI Standard process for Cover Plates for Flush-Mount Wiring Devices, the ANSI/UL 514D.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative: OWENS, T: See my explanation of negative vote on Comment 18-9.

Comment on Affirmative:

PIERCE, J: See my explanation of Negative vote on Comment 18-9.

18-11 Log #328 NEC-P18  Final Action: Reject

(406.4(D)(1))

Submitter: Bruce King, Black & Veatch

Comment on Proposal No: 18-19a

Recommendation: (1) 2-pole, 3-wire, and 3-pole, 4-wire grounding, blade type receptacles shall have the ground pin oriented on the top for vertical installations, and to the left hand side for horizontal installations.

Substantiation: IEEE standard 602-1996 Section 4.2.2 specifically address’ ground prong orientation to be on top for vertical alignment, or on left when on horizontal installation. FDA has issued warnings attributing ground prong installation being on bottom as the cause of hospital bed fires. As a minimum, NFPA should include an FPN to this section taking a position that gives preference to the top or left position. Through use of an FPN, other orientations could still be allowed when based on either equipment manufacturer recommendations, or equipment installed location. This issue is a true safety concern, not a design preference, and needs to be addressed.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-15

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

BER, M.: This comment is a result of the perennial proposal to require the grounded prong to be on top in a receptacle installation. The only substantiation that has ever been presented to the panel is the “what if” defense. What if a receptacle had a metallic cover plate? What if the cover plate screw fell out? What if when the screw fell out there was a cord plugged into the receptacle? What if the cord plate fell down and contacted both grounded and ungrounded prongs at the same time? What if the switch controlling this receptacle was on? What if the resulting short tripped the breaker? Fin, Cased closed! Then there is the other scenario where: What if the cord cap was not all the way into the receptacle? What if some very thin conductive object fell between the cord cap and the cover plate? What if this object contacted the grounded and the grounded or the grounding prongs at the same time? What if the resulting short tripped the breaker? Fine, case closed. Too many “what ifs” to make this a code requirement, and not enough logic or gravity to make it a sure thing that upside down mounting would have a different result. But, if someone feels that they can save the world by installing receptacles upside down then let them proceed, there is nothing in current code language that would prohibit this.

18-12 Log #2147 NEC-P18  Final Action: Reject

(406.4(E))

Submitter: Brandon Lott, Gephart

Comment on Proposal No: 18-20

Recommendation: While technical substantiation is lacking, common sense should prevail. Gravity will hold any currents in the receptacle when not in use. It would make sense that a cover i.e., whether proof hinged cover is installed to protect the receptacle when not in use.

Substantiation: None given.

Panel Meeting Action: Reject

Panel Statement: In accordance with Sections 4.4.5(c) and 4.4.5(d) of the Regulations Governing Committee Projects this comment is rejected because the submitter has not provided specific code text to be added and has also not provided technical substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

18-13 Log #216 NEC-P18  Final Action: Accept

(406.4(G) (New))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 18-24

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Add a new 406.4(G) to read:

Corrected final text: no action
Voltage between Adjacent Devices. A receptacle shall not be grouped or ganged in enclosures with other receptacles, snap switches, or similar devices, unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts, or unless they are installed in enclosures equipped with identified, securely installed barriers between adjacent devices.

Panel Statement: The panel concludes that the hazard addressed by 404.8(B) for switches and other devices is also present for receptacles and other devices. Section 404.8(B) states: “Voltage Between Adjacent Devices. A snap switch shall not be grouped or ganged in enclosures with other snap switches, receptacles, or similar devices, unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts, or unless they are installed in enclosures equipped with identified, securely installed barriers between adjacent devices.” Therefore, a receptacle installed in a box with an adjacent switch whose voltage between devices exceeds 300 would require a barrier. The new section will require barriers where two receptacles are installed.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-14 Log #581 NEC-P18 Final Action: Accept in Principle (406.4(G))

Submitter: Russell LeBlanc, Peterson School of Engineering
Recommendation: This proposal should be accepted.
It’s a simple, logical extension of existing requirements for similar devices. Being proactive may prevent incidents in the first place. Why wait for an incident and then be reactive.

Substantiation: Sometimes logic and common sense is an appropriate reason for making changes instead of waiting for something bad to happen and then reacting to the incident. I urge the panel members to use forward thinking in this matter.

Panel Meeting Action: Accept in Principle
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-15 Log #2149 NEC-P18 Final Action: Reject (406.4(G), FPN (New))

Submitter: Charles Browning, Travis Tech
Comment on Proposal No: 18-21
Recommendation: A Fine Print Note should be added to give direction during installation as follows:
Receptacle orientation should be considered when installing receptacles for fixed or stationary equipment with the receptacle position best suited for the cord being installed.

Substantiation: None given.

Panel Meeting Action: Reject
Panel Statement: The panel is unable to accept a fine print note for a section that is non-existent. The proposed fine print note is informational concerning receptacle orientation when mounted in a vertical surface. There is not a current section that addresses this issue.
The panel reiterates that receptacle orientation is a recommended practice by many organizations but has not received sufficient technical documentation that a correctly installed receptacle and cord cap connection presents an inherently unsafe situation.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-15a Log #1299 NEC-P18 Final Action: Reject (406.8(A))

Submitter: Robert D. Dettet, Phoenix, AZ
Comment on Proposal No: 18-28
Recommendation: This proposal should be accepted.
The receptacle shall be a listed weather resistant sunlist resistant type if subject to solar exposure.

Substantiation: It should not be required to be weather-resistant since it is required to be protected by a weatherproof coverplate. It may or may not be subject to the effects of solar exposure depending on its location and the type of weatherproof cover installed.

Panel Meeting Action: Reject
Panel Statement: The panel rejects this comment as it presents new wording that is significantly different from the concept of the referenced proposal. The panel did not take a “Hold” action on this comment, in accordance with Section 4.4.6.2.2 of the Regulations Governing Committee Projects, because the submitter did not provide sufficient technical substantiation to support this comment being automatically resubmitted to CMP 18 as a proposal in the next NEC revision cycle.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-16 Log #1424 NEC-P18 Final Action: Accept in Principle (406.8(A))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 18-28
Recommendation: The Proposal should be accepted in Principle with the proposed text revised to read as follows and with the addition of a new Figure and FPN. This comment is a companion to the NEMA comments on Proposals 18-33 and 18-35.
15- and 20-ampere, 125- and 250-volt receptacles conforming to the configurations shown in Figure 406.8(B) shall be Listed weather-resistant type.

Substantiation: NEMA supports the intent of the proposals to require listed weather resistant receptacles in damp and wet locations. However, this requirement should be limited to 15 and 20 amperes, 125 and 250 volt straight blade receptacle configurations. These are the receptacles that were covered by NEMA/UL field study cited in the substantiation for the proposals. In reviewing available field data, the NEMA wiring device manufacturers have concluded that it is predominately 15 and 20 amperes straight blade receptacles that are affected by the conditions described in the substantiation. This is most likely due to use and installation practices commonly associated with these receptacles.

The new section will require barriers where two receptacles are installed.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-17 Log #2321 NEC-P18 Final Action: Reject (406.8(A))

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 18-28
Recommendation: Reject this Proposal.
Substantiation: There are no listed weather resistant receptacles. In fact, there are not even any requirements for a listed weather resistant receptacle. Why would the code panel agree to such a requirement when they have no idea if the claimed situation will be addressed by the ultimate requirements. In fact, the proposal doesn’t even outline the problems in enough detail.
We have code requirements for the installation of boxes and covers that are to handle the situation described. If the receptacle is performing poorly, then the receptacle manufacturers should improve their product designs to accommodate the intended installations. It’s clear that the receptacle manufacturers know that their product will be installed in these environments (since the code has requirements for certain installations to have outdoor receptacles), so they should have already taken this into account into their designs.
In addition, the requirement will end up applying to situations that are not impacted by some of the stated issues. One example is receptacles in Power Outlets. These receptacles are typically behind metal covers that can be closed with the cord in place. Why is a UV resistant receptacle needed?
Lastly, it is somewhat ridiculous to attempt to have two different receptacles. Contractors and inspectors will be faced with continual problems in trying to sort out the right receptacle for indoor versus outdoor. Receptacle applications such as this are universal. If the receptacle needs to be improved, then the receptacle manufacturers need to make the improvements - not complicate the code.

Panel Meeting Action: Reject
Panel Statement: The substantiation provided with Comment 18-16 indicates that these receptacles will be available prior to the effective date shown in Proposal 18-28.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-18 Log #1426 NEC-P18 Final Action: Accept in Principle (406.8(B)(1))
Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 18-33
Recommendation: The Proposal should be Accept in Principle with the proposed text revised as follows and with the addition of a new Figure and FPN. This comment is a companion to the NEMA comments on Proposals 18-28 and 18-35.

The receptacles conforming to the configurations shown in Figure 406.8(B) shall be Listed weather resistant type. The listed weather resistant requirements shall become effective on January 1, 2011.

FPN: Complete details of the configurations can be found in ANSI/NEMA WD6, National Electrical Manufacturers Association Standard for Dimensions of Attachment Plugs and Receptacles.

![Figure 406.8(B) Receptacle Configurations](image)

15-A, 125-V, 2-pole, 3-wire, grounding type
20-A, 125-V, 2-pole, 3-wire, grounding type
20-A, 125-V, 2-pole, 3-wire, grounding type
20-A, 250-V, 2-pole, 3-wire, grounding type
20-A, 250-V, 2-pole, 3-wire, grounding type

![Images of Receptacle Configurations](image)

18-19 Log #1884 NEC-P18 Final Action: Accept (406.8(B)(1))
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 18-30
Recommendation: Reject the proposal.
Substantiation: After reviewing Mr. Well’s negative comment, I believe he is correct. The receptacle type discussed in the proposal should be subject to 406.8(B)(2), not (B)(1).
Panel Meeting Action: Accept Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Substantiation: NEMA supports the intent of the proposals to require listed weather resistant receptacles in wet locations. However, this requirement should be limited to 15 and 20 ampere, 125 and 250 volt straight blade receptacle configurations. These are the receptacles that were covered by NEMA/UL field study cited in the substantiation for the proposals. In reviewing available field data, the NEMA wiring device manufacturers have concluded that it is predominantly 15 and 20 ampere straight blade receptacles that are affected by the conditions described in the substantiation. This is most likely due to the use and installation practices commonly associated with these receptacles. Requiring 15 and 20 ampere receptacles to be listed weather resistant type will ensure that the receptacles subject to the conditions described in the proposal substantiations will be of sufficiently robust design to withstand these conditions. Requiring all 15 and 20 ampere, 125 and 250 volt receptacles to be listed weather resistant type would include locking type receptacles of these ratings. NEMA wiring device manufacturers have been unable to identify any field reports that indicate that the locking receptacles are experiencing the same adverse affects that occur with the 15 and 20 amp straight blade receptacles installed in wet locations.

NEMA is currently working with UL to develop requirements for Listed weather resistant receptacles that will be included in UL 498. This will ensure availability of Listed weather resistant receptacles prior to the adoption of the 2008 NEC. NEMA recommends deleting the January 1, 2011 effective date from this proposal.

Panel Meeting Action: Accept in Principle
Revise the recommended text to read:

(B) Wet Locations.
(1) 15- and 20-Ampere Receptacles in a Wet Location. All 15- and 20-ampere, 125- and 250-volt receptacles installed in a wet location shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted. All 15- and 20-ampere, 125- and 250-volt nonlocking receptacles shall be listed weather resistant type. This listed weather resistant requirement shall become effective on January 1, 2011.


Insert the exception added by the panel action on Proposal 18-34 following the new fine print note.
Panel Statement: The panel revised the recommended text “through” to “and” as a result of their action on Comment 18-19 and 18-20. The panel has also revised the text and added a fine print note to clarify that only nonlocking receptacles are required to be listed and identified as weather-resistant type. The substantiation provided with this comment indicates that these receptacles will be available prior to the effective date shown in Proposal 18-28.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-20 Log #1932 NEC-P18 Final Action: Accept (406.8(B)(1))
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-30
Recommendation: Reject the proposal.
Substantiation: A 208Y/120-volt application should be addressed in 406.8(B)(2) that allows for receptacles to be behind wet location covers that only exclude water with the cord not inserted. This allows for screw-down covers with enclosed gaskets that easily withstand a hose stream exposure.
Panel Meeting Action: Accept Number Eligible to Vote: 12
Ballot Results: Affirmative: 12


18-21 Log #2322 NEC-P18 Final Action: Reject (406.8(B)(1))
Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 18-33
Recommendation: Reject the Proposal.
We have code requirements for the installation of boxes and covers that are to handle the situation described. If the receptacle is performing poorly, then the receptacle manufacturers should improve their product designs to accommodate the intended installations. It’s clear that the receptacle manufacturers know that their product will be installed in these environments (since the code has requirements for certain installations to have outdoor receptacles), so they should have already taken this into account into their designs.

In addition, the requirement will end up applying to situations that are not impacted by some of the stated issues. One example is receptacles in Power Outlets. These receptacles are typically behind metal covers that can be closed with the cord in place. Why is a UV resistant receptacle needed?

Lastly, it is somewhat ridiculous to attempt to have two different receptacles. Contractors and inspectors will be faced with continual problems in trying to sort out the right receptacle for indoor versus outdoor. Receptacle applications such as this are universal. If the receptacle needs to be improved, then the receptacle manufacturers need to make the improvements - not complicate the code.

Panel Meeting Action: Reject
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

18-22 Log #1425 NEC-P18 Final Action: Reject
(406.8(B)(1) Exception (New))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)

Comment on Proposal No: 18-34
Recommendation: NEMA agrees in Principle with the exception to not require an “in-use” cover under certain conditions, but does not agree with the reference to high-pressure spray washing. We recommend changing the exception as follows:

[406.8(B)(1) Exception (New)]

Exception: 15- and 20-ampere, 125- through 250-volt receptacles installed in a wet location and subject to routine high-pressure spray washing wash down, or similar procedures where cord openings of an in-use cover would allow water entry, shall be permitted to have an enclosure that is weatherproof when the attachment plug is removed.

Substantiation: Covers that are weatherproof only with the plug removed have not been tested for high-pressure spray washing. This exception would provide a weatherproof enclosure only with plug removed similar to 406.8(B)(2)(b), other receptacles attended while in use. There are covers and devices listed that can provide higher levels of protection as needed.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided sufficient technical substantiation to support the expansion of the applications covered in the exception.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 10 Negative: 2

18-24 Log #2323 NEC-P18 Final Action: Accept
(406.8(B)(2))

Submitter: Jim Pauley, Square D Company

Comment on Proposal No: 18-35
Recommendation: Reject the Proposal.
Substantiation: There are no listed weather resistant receptacles. In fact, there are not even any requirements for a listed weather resistant receptacle. Why would the code panel agree to such a requirement when they have no idea if the claimed situation will be addressed by the ultimate requirements? In fact, the proposal doesn’t even outline the problems in enough detail.

We have code requirements for the installation of boxes and covers that are to handle the situation described. If the receptacle is performing poorly, then the receptacle manufacturers should improve their product designs to accommodate the intended installations. It’s clear that the receptacle manufacturers know that their product will be installed in these environments (since the code has requirements for certain installations to have outdoor receptacles), so they should have already taken this into account into their designs.

In addition, the requirement will end up applying to situations that are not impacted by some of the stated issues. One example is receptacles in Power Outlets. These receptacles are typically behind metal covers that can be closed with the cord in place. Why is a UV resistant receptacle needed?

Lastly, it is somewhat ridiculous to attempt to have two different receptacles. Contractors and inspectors will be faced with continual problems in trying to sort out the right receptacle for indoor versus outdoor. Receptacle applications such as this are universal. If the receptacle needs to be improved, then the receptacle manufacturers need to make the improvements - not complicate the code.

Panel Meeting Action: Accept
Panel Statement: The panel does not agree with the substantiation provided by the submitter. See the panel action on Comment 18-23 which limits the application of the weather-resistant receptacles to 15- and 20-ampere, 125 volt and 250 volt nonlocking types.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
In the event that the device is being used in a manner that is not part of the premises wiring system, it shall be connected to the equipment grounding conductor of the premises wiring system. The directions to the TCC that the original proposal be forwarded to CMP 5 for comment is required by the proposal’s recommendation to disconnect the equipment grounding conductor to a piece of equipment. This would pose a violation of the requirements within Article 250 which is under the purview of CMP 5.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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It is ironic that the panel has recommended sending the proposal to Panel 5 “for action”, while taking the position that requirements for usage of a device not permanently connected to the premises wiring system do not belong in the NEC.

**Panel Meeting Action:** Reject

**Panel Statement:** The panel reiterates that the proposed device is intended for inclusion within the cord for a specific type of equipment and as such is part of the equipment listing process. The panel also reviewed the conditions presented in the original proposal as the justification for requiring this device. The issue presented is not with the equipment grounding conductor to which the equipment is connected. It is apparent that prior testing of the circuit for proper wiring with a listed circuit tester would alert the user to the unsafe condition. This proposed device would not correct the problem but bypass the same problem.

The directions to the TCC that the original proposal be forwarded to CMP 5 for comment is required by the proposal’s recommendation to disconnect the equipment grounding conductor to a piece of equipment. This would pose a violation of the requirements within Article 250 which is under the purview of CMP 5.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12
cap into the sample that was available during the panel meeting. At over 250 pounds I have always felt I was pretty strong, but I could not push the cord into the sample provided I am truly concerned as to how my 115 pound, 86 year old mother would be able to handle plugging in her oxygen pump.

BOYNTON, C.: I am voting against the panel and recommending to delete section 406.11. Tamper proof receptacles will be difficult for some people to use, not just due to the force, but because the blades have to be precisely aligned and perpendicular to the receptacle for the shutters to move. Any shaking by the hand or unsteady movement of the hand will result in extreme frustration in trying to insert the plug. I do not know of any data or studies that have proven this will not be an issue.

Deleting this proposal does not preclude the use of tamper proof receptacles if persons choose to do so. However, it allows persons who do not need them to not be forced to do so. Some of the examples seen in the presentation show children who have burns where the child chewed on the cord. This is not applicable unless “chew proof cords” are also mandated. As it stands, other options such as the caps can prevent children from inserting objects in the receptacle. The code is not a product standard. In addition, some of the objects that are inserted in the receptacle, which the presentation listed as “not perceived as dangerous by parents”, such as knives, pins, screws, nails, etc., to me are perceived as dangerous in the hands of a child regardless of a receptacle being involved or not.

Alan H. Nadon, City of Elkhart, IN

Comment on Proposal No: 18-40

Recommendation: The panel should reject this proposal.

Substantiation: The panel is correct in being concerned about the problems an aging population may have in using devices that comply with this new requirement. I agree with the comments of Mr. Wall that many households do not contain small children and may be only inhabited by adults, older children, the elderly or adults with physical impediments. I do not feel that there is sufficient substantiation to justify the installation and use of tamper resistant receptacles in all dwellings.

This is a design matter and does not belong in the Code.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative: BOYNTON, C.: See my explanation of negative vote on Comment 18-27.

18-29 Log #325 NEC-P18 Final Action: Reject (406.11)

Submitter: Alan H. Nadon, City of Elkhart, IN

Comment on Proposal No: 18-40

Recommendation: The panel should reject this proposal.

Substantiation: This is a design consideration and should not be mandated by the Code. Not just tamper resistant receptacles but, other products and design considerations are available at this time that will achieve the goal proposed by the submitter. The NFPA Electrical Safety Sheet recommends plastic safety covers as a product that would achieve this goal. The placement of receptacles at an elevation that would reduce the probability of an infant or small child from reaching a receptacle is a permitted design change that would achieve this goal. The latter would achieve the goal with no additional expense, and cause no additional problems for elderly persons or adults with physical impediments.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2


18-30 Log #326 NEC-P18 Final Action: Reject (406.11)

Submitter: Alan H. Nadon, City of Elkhart, IN

Comment on Proposal No: 18-40

Recommendation: The panel should reject this proposal.

Substantiation: The proposal is too broad as submitted. There is no allowance made for receptacles located above the level a small child could reach nor is there consideration for receptacles located behind large appliances, stoves, refrigerators, washing machines, etc.

To the best of my knowledge there are no GFCI receptacles designed as tamper proof.

In my experience I have seen these types of receptacles defeated through mis-use usually from being painted locking them in the open position and more troublesome in the closed position which leads occupants to use extension cords.

Well intentioned as this proposal may be the panel should reject it.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2


BOYNTON, C.: See my explanation of negative vote on Comment 18-27.

18-31 Log #339 NEC-P18 Final Action: Reject (406.11)

Submitter: Robert A. Jones, IEC Texas Gulf Coast

Comment on Proposal No: 18-40

Recommendation: Delete the following text:

406.11 Tamper Resistant Receptacles in Dwelling Units. In all areas specified in 210.52, all 125 volt, 15 and 20 ampere receptacles shall be listed tamper resistant receptacles.

Substantiation: This proposal is based on children inserting an object into a receptacle. The statistics suggest that the incidents are very rarely fatal, but will result in electric shocks and mild to severe burns.

Although the implementation of this proposal would minimize the potential of the insertion of objects into a receptacle, there still exists a remote possibility that the shutters of this receptacle could be compromised. Note, the panel is additionally concerned about the possible increased insertion force required for the aging population.

My suggestion is not to add this text, but to modify 210.8(A) by installing GFCI protection to all rooms in a dwelling unit. This would eliminate any hazard associated with objects being inserted into any receptacle, not just minimize the potential.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2


BOYNTON, C.: See my explanation of negative vote on Comment 18-27.

18-32 Log #616 NEC-P18 Final Action: Reject (406.11)

Submitter: Ronald Sweigart, Dupont

Comment on Proposal No: 18-40

Recommendation: This proposal should be rejected.

Substantiation: I am as concerned about the welfare of children as NEMA, however Code-Making Panel 18 was not provided with enough technical substantiation to require all 125-volt, 15- and 20-ampere receptacles in areas specified in 210.52 to be listed tamper resistant receptacles.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3


BOYNTON, C.: See my explanation of negative vote on Comment 18-27.

TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-33 Log #639 NEC-P18 Final Action: Reject (406.11)

Submitter: Robert A. Jones, IEC Texas Gulf Coast

Comment on Proposal No: 18-40

Recommendation: This proposal should be rejected.

Substantiation: The current requirements contained in UL 498 for tamper resistant receptacles only investigates single pole insertion of a test probe with a force of 8 ounces (1N) in an attempt to simulate someone (a child) to bypass the tamper resistant mechanism. A standard does not exist for the insertion force necessary to insert a two or three prong plug into a tamper resistant receptacle. The requirement for tamper resistant receptacles to be installed in dwelling units could have a serious affect on the safety of elderly or impaired people. These people may not have the strength to fully insert a plug into these types of receptacles. If the plug prongs are not fully engaged, then the exposed parts could lead to shock or fire hazards. This could be a very serious problem since the population of America is aging and more new dwelling units
are being built as assisted living and independent living housing in retirement communities. A study should be made and a standard developed for the insertion force necessary for these tamper resistant receptacles before the code requires they be installed in dwelling units.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject

18-34 Log #640 NEC-P18

Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

Submitter: Martin Schumacher, Howard County Government Electrical Plan Review

Comment on Proposal No: 18-40
Recommendation: Delete new section 406.11.

Substantiation: There is no clear evidence to substantiate this new article. Now that GFI and AFCI circuits are or will be installed throughout all or most of the house, this will reduce the hazards that are exposed with standard receptacles to our children. Without clear evidence that our children are being killed or severely injured, this article cannot be justified.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject

18-35 Log #691 NEC-P18

Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

Submitter: Gordon A. Stewart, Joe Swartz Electric Company, Inc. Ltd.

Comment on Proposal No: 18-40
Recommendation: This proposal should be rejected.

Substantiation: NEMA Business Information Services Department estimated the average new home cost will be increased by $37.50, however, that cost estimate does not cover the cost increase for a tamper resistant GFCI receptacle. At the present time, a tamper resistant GFCI receptacle is $19.50 higher than a non-tamper resistant GFCI receptacle. There is an average of 4 GFCI receptacles used in the average home. This equates to $115.50 plus tax, plus distributor, electrical contractor, and general contractor markup per home, not $37.50. Depending on percentage of markup the increase per home could be over $200.00.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject

18-36 Log #692 NEC-P18

Submitter: Gordon A. Stewart, Joe Swartz Electric Company, Inc. Ltd.

Comment on Proposal No: 18-40
Recommendation: This proposal should be rejected.

Substantiation: If Proposal 2-142 is made a requirement of the 2008 NEC, then all 125V 15 and 20 amp branch circuits will have arc fault protection. NEMA Business Information Services Department estimated the average new home cost will be increased by $37.50 for the addition of tamper resistant receptacles; however, that cost estimate does not cover the cost increase for the additional arc fault protection. Exactly how much will a new home’s cost be increased? Will anybody be able to afford to live in these ultra safe homes?

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject

18-37 Log #897 NEC-P18

Submitter: Michael P. O’Quinn, MOGO Enterprises, Inc.

Comment on Proposal No: 18-40
Recommendation: Reject this proposal.

Substantiation: Mr. Wall’s Explanation of Negative points out that no sufficient technical substantiation has been provided to warrant installation of tamper-proof receptacles in all dwelling locations, especially addressing the possible effects of these receptacles with the increase aging of the American population. There is also no data to note the effective cost or availability of tamper-resistant GFCI, which could cover a large percentage of the receptacles in question.

Please note that 210.60 and 210.18, along with this change, would require tamper-proof receptacles in guest rooms or guest suites with cooking provisions - probably not the intent of the submitter. There is also no provision for the allowance of tamper-proof receptacle covers - an alternative more likely to be installed in existing dwelling units with adults concerned about small children’s safety.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject

18-38 Log #907 NEC-P18


Comment on Proposal No: 18-40
Recommendation: Delete the following text:

406.11 Tamper resistant receptacles in dwelling units. In all areas specified in 210.52 all 125 volts, 15 and 20-ampere receptacles shall be listed tamper resistant receptacles. [ROP 18-40]

Substantiation: This entire wording should be deleted and revisited at a later code change cycle.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

Final Action: Reject

18-39 Log #1042 NEC-P18

Submitter: Gilbert L. Thompson, MEIA Codes and Standards

Comment on Proposal No: 18-40
Recommendation: The Panel should reconsider their action and reject the new proposal and delete all of the proposed new wording that would add a new Section 406.11. This is a manufactures' recommendation to make a drastic change to existing wiring devices without evaluating the problems that could be generated or the cost to the industry and public. There is no time table in the proposal to accommodate existing stocks. What happens to contractors, supply houses and discount stores with supplies on hand? Many jurisdictions have not adopted the new code and are still using other editions. Have GFCI and special outlets been designed for this new requirement? What happens to replacements and existing installations?

Substantiation: Our inspectors associations agree with the negative comments of Mr. Wall. There are many communities that cater to assisted living, elderly care residents and the only children in the units are the ones that visit. Tamper-resistant receptacles or covers for specific locations where children are located have already been addressed in Section 517.18(C) for pediatric care.
Also, many health care facilities that treat mental patients require these type receptacles in psychiatric wards. Parents and concerned parties already have alternate means (special covers, plastic inserts, etc.) to protect their children. An example of good sense are dangerous chemicals stored in kitchen cabinets and a simple lock for the cabinet doors keeps the children out. It still should be a choice for safety-minded people as to how to protect their children.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-40 Log #1192 NEC-P18 Final Action: Reject (406.11)
Comment on Proposal No: 18-40
Recommendation: Reject Proposal 18-40
Substantiation: Rejection of this proposal is based on the issues identified by Mr. C. Wall in his negative ballot comment on Proposal 18-40.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-41 Log #1297 NEC-P18 Final Action: Reject (406.11)
Comment on Proposal No: 18-40
Recommendation: This proposal should be rejected.
Substantiation: Please consider the information below before making a decision concerning this proposal.
There are major concerns about the insertion force required that would affect the elderly and the physically impaired as well as many people with physical ailments that would be limited by the strength in their hands.
According to the submitter, there would only be an additional cost of approximately 0.50 per receptacle. In speaking to suppliers in the area the estimated cost could range from $5.00 to $13.00 at today’s rates. This was based on calls made to get pricing for this product to 3 suppliers in the NH area. If using NEMA’s information concerning average receptacles in a house of 75, this could cost an average anywhere from $750.00 to $2,000.00 depending on the size of the house, and would place an undue burden on anyone purchasing a new home who can easily and very inexpensively install safety caps. We are not suggesting the additional expense for all of those people that do not have children within the age group that was referenced.
There is not enough true raw data to support any possible issues that a standard receptacle creates an additional hazard as opposed to a tamper resistant one. There is just an estimate based on sample counts. Even though what is shown is very informative it is not an actual count of the incidents, which we feel should be taken into consideration before making any decision on this proposal.
This will create possible conflicts with concerns to AFCI & GFCI outlets in the future. Not all conditions allow for circuit breakers to be installed, and if so, at an additional cost to the homeowner compared to receptacles. Presently, there is no such device available on the market to allow us to meet these requirements that would be set forth in this proposal or anything to show that this would have a dramatic affect with concerns to this issue.
The submitter’s data is based on sample counts and historical estimates and clearly states “The results of these incidents are rarely fatal”. This proposal should require additional research with proven facts and product development that would allow for this to become a possible option to homeowners in the future. The panel should also require the break down to show in which years these incidents occurred. It is our feeling that since 1991 the public awareness on the child safety issue with receptacles has dramatically increased. These statistics do not reflect that. They are, however, reflected within the fatality estimated reports which show that there has not been a fatality since 1998 through 2001, and only four in total.
We agree that any fatality is of grave concern and not acceptable. But as we are sure the panel knows you are unable to protect everyone in every situation from every danger. Some of this responsibility must remain on the parents or person responsible for the 2 year old child who is left unattended long enough to insert a foreign object into an outlet.
Even based on the information supplied by the submitter there were no deaths from 1998 through 2001. For almost 3 years there were no fatalities from what we believe was public awareness. And, we also believe that this trend has continued over the last 5 years, as more and more of our members see the plastic protective caps installed on outlets in a dwelling during routine service calls.
As far as safety caps go we are sure that some of the older ones may be removed with a little more ease then the newer ones. Anything over time will start to show signs of wear and tear, which includes the tensile strength of a tamper resistant outlet. Our experience is that we need to use a screwdriver to get them out and it takes quite a bit to get them out.
So instead of a homeowner being able to go out on their own, and get new safety caps if they are loosing there retention strength, they now have to call an electrician to replace the entire outlet for what is surely to be up to 5 times the cost. This does not seem to make a lot of sense. They are more likely to replace an outlet with a safety cap on it, as shown, long before they will call an electrician and spend almost $75-$90 on a service call with a new receptacle. Which then create a long lasting safety hazard because more than likely as long as the outlet works they won’t replace it. This is just human nature.
As an organization made up of Electrical Contractors and Associate members consisting of many suppliers within the area, we hope that you will take the time to consider these issues before making a decision. We thank you for your time in hearing our comments and look forward to working with you in the future.

Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-42 Log #1322 NEC-P18 Final Action: Reject (406.11)
Submitter: Tino Bermudez, TAG Electric
Comment on Proposal No: 18-40
Recommendation: This proposal should be rejected.
Substantiation: There was no evidence provided that the operation of these devices will not or cannot be circumvented by small children. The submitter has not provided a fact-finding report showing the potential reductions of the injuries with the implementation of the proposed solution of having all dwelling unit receptacles as tamper resistant.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-43 Log #1329 NEC-P18 Final Action: Reject (406.11)
Submitter: Larry W. Burns, Burns Electric, Inc.
Comment on Proposal No: 18-40
Recommendation: This proposal should be rejected.
Substantiation: Why start this requirement with dwelling units? The report given to Panel 18 states 71% of the injuries were in the home, but it did not state the extent of the injuries. The four fatalities stated in the report did not identify the occupancy where the fatality occurred. I would think the best place for this requirement would be for daycare centers, preschools, and elementary schools. The caregivers and teachers at these facilities are more overburdened with supervising children that are parent within their own home.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Explanation of Negative:
BER, M.: See my explanation of negative vote on Comment 18-27.
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.
18-44 Log #1330 NEC-P18  Final Action: Reject  
(406.11)  
Submitter: Tommy Skaff, OHMS Electric  
Comment on Proposal No: 18-40  
Recommendation: This proposal should be rejected.  
Substantiation: This proposal will only require the installation of tamper resistant receptacles in new dwelling units. The report submitted as substantiation did not identify if the incidents were occurring in new dwelling units or existing dwelling units. I don’t see how this new requirement is going to have a significant impact on reducing the number of incidents because new dwelling units are a very small percentage of available dwelling units.  
Panel Meeting Action: Reject  
Panel Statement: See the panel action and statement on Comment 18-56.  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 9 Negative: 3  
Explanation of Negative:  
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.  
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-45 Log #1331 NEC-P18  Final Action: Reject  
(406.11)  
Submitter: Bill Sherrill, Selo Industrial  
Comment on Proposal No: 18-40  
Recommendation: This proposal should be rejected.  
Substantiation: If NEMA is so concerned with protecting children from electrical shock or burns why not make the requirement for all occupancies? I guess the 696 children that will be injured in occupancies other than dwellings are of no concern to NEMA. A Code requirement is not needed. All NEMA has to do is quit manufacturing non-tamper resistant receptacles. I think their motive is more profit driven than protecting children. Obviously there is more profit in selling tamper resistant receptacles than non-tamper resistant.  
Panel Meeting Action: Reject  
Panel Statement: See the panel action and statement on Comment 18-56.  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 9 Negative: 3  
Explanation of Negative:  
BER, M.: See my explanation of negative vote on Comment 18-27.  
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.  
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-46 Log #1332 NEC-P18  Final Action: Reject  
(406.11)  
Submitter: Larry R. Brown, Seco Industrial Maintenance and Controls  
Comment on Proposal No: 18-40  
Recommendation: This proposal should be rejected.  
Substantiation: There is no evidence provided about the reliability of these devices. How many insertions can be made before the “automatic internal shutters” fail to operate properly? If the “shutter” fails does the receptacle remain in an open position? There may be tamper resistant receptacles that employ other means to achieve tamper resistant listing of the “automatic internal shutter” type seems to be most prevalent.  
Panel Meeting Action: Reject  
Panel Statement: See the panel action and statement on Comment 18-56.  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 9 Negative: 3  
Explanation of Negative:  
BER, M.: See my explanation of negative vote on Comment 18-27.  
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.  
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-47 Log #1429 NEC-P18  Final Action: Accept  
(406.11)  
Submitter: Vince Balcawski, National Electrical Manufacturers Association (NEMA)  
Comment on Proposal No: 18-40  
Recommendation: The panel should continue to Accept this Proposal.  
Substantiation: Tamper resistant receptacles will significantly reduce the number of injuries to children that result from children inserting foreign objects into a receptacle. Tamper resistant receptacles are readily available from the major receptacle manufacturers. Tamper resistant receptacles are also available as GFCI receptacles. Tamper resistant receptacles are listed in UL 498. UL 498 has a section that contains specific requirements for tamper resistant receptacles that ensure that a foreign object cannot be inserted into the receptacle and contact a live part.  
The panel expressed concern with the amount of force necessary to insert a plug into a tamper resistant receptacle. NEMA wiring device manufacturers conducted tests to compare the insertion forces required to insert a plug into a standard receptacle and into a tamper resistant receptacle. A NEMA 5-15P, 15 amps, 125 volt plug was used. The plug was mounted in a force measuring gauge as shown in the photograph. The receptacle was mounted to allow lateral movement to prevent binding of the plug upon initial insertion. The values for insertion forces with and without the tamper resistant mechanism were recorded.  
The typical insertion forces observed could be characterized as follows: When the plug blades are initially inserted into a tamper resistant receptacle, a small force of approximately 1 - 1.5 lb is required to overcome the initial resistance of the tamper resistant mechanism. This is followed by a drop in force as the plug blades have opened the tamper resistant mechanism and are passing through. As insertion continues, at the point where the blades reach and become engaged with the receptacle contacts the force increases. This is where the maximum force is observed.  
Finally, GFCI’s and AFCI’s are not intended to prevent the type of insertion force used from 10 - 20 lb, depending on the design of the receptacle. There was no appreciable difference in insertion force between tamper resistant receptacles and receptacles without the tamper resistant mechanism. The overriding forces required to open the receptacle contacts are far greater than the force exerted by the tamper resistant mechanism. The negative vote on this proposal mentioned several issues that merit comment. It was indicated that many homes do not have small children. While this may be correct at any point in time, houses are sold, kids visit grandparents and neighbors. Controlling where children are and aren’t possible, but providing a safer environment for them is...for under $40 per house.  
The negative vote also indicated that kids can’t defeat these receptacles. While the manufacturers would not claim that defeating them is impossible, they are, after all called tamper “resistant” not “proof”, the UL standard is quite thorough in testing the unintended insertion of objects. Further, for over 20 years, these products have been used in the pediatric area of new construction with no report of tampering.

The negative comment further stated that this requirement will require GFCI receptacles to be “tamper resistant”. This is correct and such GFCIs have been on the market for over a year.  
The negative comment stated that it was not demonstrated that AFCIs and GFCIs are not effective in preventing such incidents. First, AFCIs are not intended to protect against such incidents. They are intended to prevent arcing initiated fires, not burns to the finger. While GFCIs can provide some level of protection, they are only required on a limited number of circuits and only protect against some of the circumstances associated with such incidents.  
Finally, the negative comment indicated that each dwelling owner should be given the choice. Since most new home construction is speculative, prospective owners are not even known at the time the electrical installation is made. More importantly, considering the cost per home and the number of incidents a clear mandate to add these proven safety products is justified.

See my Proposal 18-40 (Log #1944) that was Accepted, along with the Explanation of Affirmative and Negative Comments on Vote for that proposal.  
Panel Meeting Action: Accept  
Panel Statement: The panel agrees with the substantiation provided with this comment and documentation with the voting during the ROP process. An identified safety hazard will be mitigated with the installation of tamper-resistant receptacles. The panel recognizes that not all receptacles listed within 210.52 are subject to child access. Yet, the overall material cost should outweigh the mind set of providing two different type of receptacles to the electricians in hopes that they would not accidentally install a standard receptacle in a location requiring the tamper-resistant type. This type of mistake could cost as much to correct, as well as the amount of the savings.  
The panel disagrees with the conclusions reached by most of the remaining submitters of comments to 406.11. Tamper-resistant receptacle costs cited in the substantiation provided with several comments are based on today’s limited demand and does not take into account the reduction that an increased demand with corresponding increase in supply. This would be similar to the difference in cost of GFCI receptacles today over when they first were required. Pediatric areas already require listed tamper-resistant receptacles.

Finally, GFCI’s and AFCI’s are not intended to prevent the type of burn incidences resulting from inserting conductive foreign objects into a receptacle. GFCI’s provide protection from electrocution resulting from low level ground faults and AFCI’s provide protection against fires resulting from arcing type faults.  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 9 Negative: 3  
Explanation of Negative:  
BER, M.: See my explanation of negative vote on Comment 18-27.  
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.  
TODD, S.: I am voting negative on Comment 18-47. EEI agrees that there is sufficient substantiation that tamper resistant type receptacles are more accessible to unattended small children is safer than standard receptacles in that same area. However, there is no justification presented for a requirement for these receptacles where they are not accessible to children. Tamper resistant
receptacles furthermore should not be required in homes that do not contain small children. The commenter requested the Panel continue to accept Proposal 18-40. Proposal 18-40 requires all 125-volt, 15- and 20-ampere receptacles in areas specified by 210.52 to be listed tamper resistant receptacles even though not all of the area will be accessible to small children (ages 9 months to 5 years) which are the people the substantiation states that these devices are to protect. This all-encompassing change puts an unnecessary burden on the end use customer for those installations of receptacles inaccessible to small children such as for refrigerators or for wall receptacles above countertops. Furthermore, tamper resistant receptacles or faceplates with tamper resistant features are not available at the $0.50 premium as discussed in the substantiation. Although EEI supports the safe installation of premises wiring in the Code and the concept proposed in the original proposal and this comment, EEI cannot accept this change without having the specific facts to broadly apply this requirement throughout the entire dwelling’s premises wiring.

Comment on Affirmative:
PIERCE, J.: I continue to recommend an affirmative vote on this proposal to add tamper resistant receptacles to this Article. Some have said the increased cost and intrusion into our homes is not worth it. I disagree. This is an improved design with obvious benefits. These points against the proposal are always used and we as Committee members should rise above those tired reasons to vote reject.

18-48 Log #1870 NEC-P18 Final Action: Reject (406.11)
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 18-40
Recommendation: This proposal should be rejected.
Substantiation: Child resistant caps are readily available for those people who want them. The fact that some end-users have children that stick things in outlets should not influence the end users who do not.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

18-49 Log #1934 NEC-P18 Final Action: Reject (406.11)
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-40
Recommendation: Reject the proposal.
Substantiation: There are a host of practical problems in this proposal, as well as, major issues of significant principle regarding the function of the NEC. The practical issues concern whether the new receptacle designs will be adult proof, and on what range of receptacles the features will be available. For example, my house is wired throughout with 5362 series industrial grade 20-amp duplex receptacles that cost on the order of $15 each. Would it be possible to achieve that level of quality in the future if this proposal goes forward? I rather doubt it, because the receptacle manufacturers will probably make the business decision that they will only make child-resistant receptacles in the residential and commercial grades of receptacle. Unless CMP 18 imposes the rule as a construction specification for all such receptacles, I would look forward to a decreased quality expectation regarding receptacle performance.

The more serious issue, however, concerns the extent to which The National Electrical Code is expected to act in loco parentis. I have raised four children, and part of the process of having a toddler is kid-proofing the house. Receptacle inserts go in all the unused receptacle slots, latch retainers go into the under-sink cabinets, etc. Then, when they get a little older, the inserts come out. Is it really necessary to impose a rule with practical problems that only has significant value during a very small fraction of the life cycle of a house or apartment? My house was built in 1868, and as near as I can figure from deed and probate records, toddlers only were in residence for about 10 percent of that time.

The debate over receptacle placements on kitchen island may be relevant here. CMP 2 was going to require, in effect, tombstone receptacle outlets on flat islands because a receptacle on the side of the island would be an attraction for a toddler, who might pull a hot appliance off the counter and get scalded. In the end, I was successful in convincing CMP 2 that the parent was the appropriate arbiter of when it was appropriate to use a receptacle on the side of an island, and not the code making panel. The same is true with toddler access to receptacles.

This proposal is one of several from NEMA this cycle that increase the value added to electrical products in mature markets, and as such are grounds for skepticism. This proposal does not comply with 90.1(B).

18-50 Log #1975 NEC-P18 Final Action: Reject (406.11)
Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 18-40
Recommendation: This Proposal should be Rejected.
Substantiation: There is no legitimate reason that every receptacle should be suitable for use around small children. Many are not installed where they would be accessible to small children - kitchen countertops, behind refrigerators and other dedicated spaces for appliances. Many products are available that preclude insertion, and people can easily obtain these items if they need them. This proposal is dramatic over-reaching in solving a problem that does not exist in the majority of dwelling units. Furthermore, the panel statement and comments on affirmative indicate that additional information should have been provided or obtained before a decision was made. This submitter agrees with the comment on negative by Mr. Wall.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

18-51 Log #2098 NEC-P18 Final Action: Reject (406.11)
Submitter: James H. Maxfield, Dover, NH
Comment on Proposal No: 18-40
Recommendation: Delete the following text:

406.11 Tamper Resistant Receptacles in Dwelling Units. In all areas specified in 210.52, all 125-volt, 15- and 20-ampere receptacles shall be listed tamper resistant receptacles.

Substantiation: The proposal appears to be unconvincingly substantiated. (unreadable) the acceptance of this proposal appears to provide a safer installation. It is a design specification rather than a minimum standard, for example, GFCI protection on luminaries and exhaust fans for tub/showers could be safer. However, proposals have been rejected for several code cycles. Secondly, the proposal only references 125-volt, 15- and 20-ampere receptacles. Alternate the proposed text would apply to receptacles which are not readily accessible. The proposal should be rejected as this previously accepted by Panel 18 during the proposal process. Lastly, I do not believe the industry manufacturers tamper resistant multi outlet assemblies.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3

18-52 Log #2121 NEC-P18 Final Action: Reject (406.11)
Submitter: Jason Evans, Moriaety Electric Co.
Comment on Proposal No: 18-40
Recommendation: Delete the following text:

406.11 Tamper Resistant Receptacles in a Dwelling Unit. In all areas specified in 210.52, all 125-volt, 15- and 20-ampere receptacles shall be listed tamper resistant receptacles.
Substantiation: Why tamper resistant receptacles should not be code for dwelling units. I agree with the increase. Insertion of force not only for the aging population, but for anybody. Also, the increased risk of using finger or other object to push aside the tamper resistant switch should apply to daycares, hospitals waiting areas.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

18-53 Log #2137 NEC-P18 (406.11) Final Action: Reject

Submitter: Robert Garza, Joe Swartz Electric Company

Comment on Proposal No: 18-40

Recommendation: This Proposal should be Rejected.

Substantiation: The report submitted to Code Panel 18 was dated 2002 and based on data collected years before. Since that time, arc fault protection requirements have been implemented in dwelling unit bedrooms. We have been told that arc fault protection is the answer to most injuries and fires in dwelling units. If the insertion of a conductive item in a receptacle causes a burn, then surely an arc will be present. The signature of this arc would be very different from that of an actual load and the arc fault protective device would operate and the circuit would be turned off. Why require another form of protection?

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

18-54 Log #2138 NEC-P18 (406.11) Final Action: Reject

Submitter: Scott Badger, Lebanon, ME

Comment on Proposal No: 18-40

Recommendation: Delete the following text:

406.41 Tamper-Resistant Receptacles in Dwelling Units. In all areas specified in 210.52, all 125-Volt, 15- and 20-ampere receptacles shall be listed tamper-resistant receptacles.

Substantiation: My concern is the elderly or physical impediments. This should be up to the home owner if they need tamper resistant. This code should be for child care facilities, not dwellings.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

18-55 Log #2143 NEC-P18 (406.11) Final Action: Reject

Submitter: Gordon A. Stewart, Joe Swartz Electric Company, Inc. Ltd.

Comment on Proposal No: 18-40

Recommendation: This Proposal should be Rejected.

Substantiation: Panel 18 needs to consider more than one report of injuries. The report submitted to the Panel is a probability sample not an actual report of injuries. The report states there were 129 reported incidents and somehow that translates to 3,277 incidents for 2002. Panel 18 should request information on what methodology was used to arrive at that figure. Also, of the 129 reported incidents what was the extent of the injuries? This report needs to be scrutinized because it seems to be written as a scare tactic.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-56.

Number Eligible to Vote: 12

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.

Ballot Results: See the panel action and statement on Comment 18-56.
Comment on Proposal No: 18-40
Recommendation: Proposal 18-40 (Log #1944) should be rejected.
Substantiation: 1. There are major concerns about the insertion force required that would affect the elderly and the physically impaired as well as many people with physical ailments that would limit the strength in their hands.
2. According to the submitter, there would only be an additional cost of 50 cents per receptacle. According to suppliers in the area, the cost could range from $5.00 to $13.00. This would place an undue burden on anyone purchasing a new home who can easily and very inexpensively install safety caps.
3. There is not enough data to support any possible issues that a standard receptacle devices.
4. This will create possible conflict with concerns to AFCI and GFCI outlets in the future. Not all conditions allow for circuit breakers to be installed, and if so, again at additional cost to the homeowner.
5. The submitter’s data is based on sample counts and historical estimates and clearly states: “The results of these incidents are rarely fatal.” This proposal should require additional research with proven facts and product development that would allow for this to become a possible option to homeowners in the future.

Panel Meeting Action: Reject
Panel Statement: The Panel has reviewed all comments and concludes that requiring tamper-resistant receptacles will effectively reduce child burns and electrocution. Specific responses to comments are as follows:
1. Test data presented to the panel indicates insertion and withdrawal forces will not be a problem for the aged or physically challenged. Insertion forces necessary to open the shutter at 20-25% those necessary to insert a plug into a receptacle and once the shutters are cleared no additional force is required to engage the plug into the receptacle contacts.
2. The safety justification is compelling. CPSC and CHIRPP use highly sophisticated statistical models that allow accurate estimates of the total universe. The fact that CPSC data was remarkably similar to a totally different study in Canada corroborates both sets of data.
3. The plastic safety caps mentioned in some substantiations have been available during the entire time of the hospital emergency room data collection in both the US and Canada and did not mitigate thousands of burn incidents each year.
4. The UL/ANSI standard has requirements and tests that attempt to defeat the shutters. UL fully tests with a probe to try to manipulate opening. Similar products have been in use for over 20 years in pediatric areas with no evidence of them being defeated. Shutters are commonly used in European electrical receptacle devices.
5. The NEMA cost estimate was based on the cost adder for residential type tamper resistant receptacles produced in the volumes this requirement would result in. Cost estimates based on hospital or specification grade products are based on today’s market size and do not provide a valid comparison.
6. The panel considered limiting the requirements. The hazard exists on vanity and kitchen countertops on which children are placed and which have easily accessed receptacles. Given the very few receptacles that would, under all circumstances, not be accessible and the modest cost of the receptacles, it was decided that a clear, unambiguous requirement would be easier to follow and enforce.
7. Neither AFCI nor GFCI eliminate the faults that result in the child burns.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
BOYNTON, C.: See my explanation of negative vote on Comment 18-27.
TODD, S.: This comment should have been accepted. See my explanation of negative vote on Comment 18-47.

18-58 Log #2115 NEC-P18 Final Action: Reject
(406.11 Exception (New)
Submitter: Matthew Hoffman, Dover, NH
Comment on Proposal No: 18-40
Recommendation: Add an Exception to read as follows:
This article will not apply to elderly housing, hospitals or other types of core facilities.
Substantiation: By adding this exception it will help prevent situations where elderly or disabled persons may have trouble using tamper resistant receptacles, due to the excessive force needed to insert a plug into this type of receptacle.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-56.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative: BOYNTON, C.: I am voting with the panel to reject this exception for the simple reason that I am rejecting 406.11 being in the code in the first place. See my explanation of negative vote on Comments 18-27 through 18-57.

ARTICLE 408 — SWITCHBOARDS AND PANELBOARDS

9-56 Log #61 NEC-P09 Final Action: Accept
(408.4)
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 9-101
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the Panel Action on Proposal 9-105. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The final text incorporates the actions on both Proposals 9-101 and 9-105. The resulting text is as follows:
Every circuit and circuit modification shall be legible identified as to its clear, evident, and specific purpose or use. The identification shall include sufficient detail to allow each circuit to be distinguished from all others. Spare positions that contain unused overcurrent devices or switches shall be described accordingly. The identification shall be included in a circuit directory that is located on the face or inside of the panel door in the case of a panelboard, and located at each switch on a switchboard. No circuit shall be described in a manner that depends on transient conditions of occupancy.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Every circuit and circuit modification shall be legibly identified as to its
as information to the user. These must be purchased through NECA. This
Notes, serves no benefit to the user of the National Electrical Code. These are
Substantiation: This is a direction from the National Electrical Code Technical
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See the action on Comment 9-56 for the resulting text.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Panel Meeting Action: Reject
Panel Statement: The intent of the panel is to be clear and use a method that
will be valid over an extended period of time.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Submitter: Mark Shapiro, Farmington Hills, MI
Comment on Proposal No: 9-105
Recommendation: Revise text to read as follows:
Every circuit and circuit modification shall be legibly identified as to its
clear, evident, and specific purpose or use. The identification shall include
sufficient detail to allow each circuit to be distinguished from all others. Spare
positions that contain unused overcurrent devices or switches shall be described
accordingly. The identification shall be included in a circuit directory that is
located on the face or inside of the panel door in the case of a panelboard, and
located at each switch on a switchboard.
Substantiation: This proposal should be accepted as written marking
switchboards panelboards is a major concern for building owners and operators
the term “and located at each switch on a switchboard” is a good practice when
the panel directories have been lost or not updated.
Panel Meeting Action: Accept in Principle
Panel Statement: The comment text appears to be a verbatim transcription
of the final panel action on Proposal 9-101, but does not include the action
on Proposal 9-105. Refer to the action on Comment 9-56 for the complete text.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

TCC Action: The Technical Correlating Committee does not agree with
the request of the submitter, as accepted by the panel, to globally prohibit
these types of Fine Print Notes and that each panel should continue to act
on the merits of such proposals, if any, within its purview.
Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 9-106
Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print
Notes, serves no benefit to the user of the National Electrical Code. These are
not standards, they are a compilation of generic information and do not serve
as information to the user. These must be purchased through NECA. This
FPN as written is nothing more than free advertisement for generic, readily
available information which must be purchased by the code user. A total of
seventeen new Fine Print Notes were proposed to reference NECA standards.
Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in
direct conflict with 90.1(C). The TCC should intervene to prohibit these types
of Fine Print Notes. CMP 9 should continue to reject this FPN. Failure to do
so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA,
NEI, SELA, AISI, API, ASHE, AHAM, CEEI, NYBFU and dozens of others
when they decide to develop income through generic standards development.
If this type of Fine Print Note is placed anywhere in the NEC an Annex should
be included with coupons for the code user. If the NEC is to be used for
advertisement purposes, coupons should be included.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Panel Meeting Action: Accept in Principle
Panel Statement: Not all of the itemized parts of Article 220 will apply in any
given case.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

TCC Action: The Technical Correlating Committee does not agree with
the recommendation of the submitter to move all such Fine Print notes
into an Annex as recommended in the substantiation. Each panel should
continue to act on the merits of such proposals.
Location of all references in an Annex does not enhance usability.
Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 9-106
Recommendation: The panel is encouraged to continue to Reject Proposal
9-106
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit
the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels
that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and
installation manuals exist and to only mention one does not adequately inform
the public about accepted industry practices. The NEC is not intended to be an
instruction manual for untrained persons. If the FPNs are allowed to reference
these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to
cover different models of equipment, approval of the FPN may lead many to
believe these standards can be used instead of listed or labeled manufacturer’s
instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the
Annex with the other references.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

(Note: The sequence no. 9-62 was not used.)
Proposal 9-117 should continue to be Accept in Principle, but the Exceptions need revisions. 408.36 should be revised as follows:

408.36 Overcurrent Protection. In addition to the requirements of 408.30, a panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

Exception No. 1: Individual protection shall not be required for a panelboard used as service equipment and containing not more than six overcurrent devices. For the purposes of this exception, the term “overcurrent protective device” means a single or a multipole circuit breaker, breakers, or single fuse or set of fuses, operable or disconnectable by a single motion of the hand and that supplies a single load, with multiple disconnecting means in accordance with 230.71. Each single-pole circuit breaker or single-pole fused switch within the disconnecting means shall be rated greater than 30 amperes. In panelboards protected by three or more main circuit breakers or sets of fuses, the circuit breakers or sets of fuses shall not feed a second bus structure within the same panelboard assembly.

Exception No. 2: Individual protection shall not be required for a panelboard individually protected on its supply side by not more than two main circuit breakers or two sets of fuses having a combined rating not greater than that of the panelboard. A panelboard constructed or wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of this exception, determining the maximum of 42 overcurrent devices, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.

Exception No. 3: For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual residential occupancy.

Panel Meeting Action: Accept in Principle

Take no action under this comment.

Panel Statement: The underlying text to which this comment refers is being deleted. Refer to the panel action and statement on Comment 9-70.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Proposal 9-118 should continue to be Accept in Principle, but the Exceptions need revisions. 408.36 should be revised as follows:

408.36 Overcurrent Protection. In addition to the requirements of 408.30, a panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

Exception No. 1: Individual protection shall not be required for a panelboard used as service equipment and containing not more than six overcurrent devices. For the purposes of this exception, the term “overcurrent protective device” means a single or a multipole circuit breaker, breakers, or single fuse or set of fuses, operable or disconnectable by a single motion of the hand and that supplies a single load, with multiple disconnecting means in accordance with 230.71. Each single-pole circuit breaker or single-pole fused switch within the disconnecting means shall be rated greater than 30 amperes. In panelboards protected by three or more main circuit breakers or sets of fuses, the circuit breakers or sets of fuses shall not feed a second bus structure within the same panelboard assembly.

Exception No. 2: Individual protection shall not be required for a panelboard individually protected on its supply side by not more than two main circuit breakers or two sets of fuses having a combined rating not greater than that of the panelboard. A panelboard constructed or wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of this exception, determining the maximum of 42 overcurrent devices, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.

Exception No. 3: For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual residential occupancy.

Panel Meeting Action: Accept in Principle

Take no action under this comment.

Panel Statement: The underlying text to which this comment refers is being deleted. Refer to the panel action and statement on Comment 9-70.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Panel Meeting Action: Accept in Principle

Refer to the panel action and statement on Comment 9-70.

Panel Statement: The actions and panel statement on Comment 9-70 address the concerns raised in this comment.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

Exception No. 1: Individual protection shall not be required for a panelboard used as service equipment and containing not more than six overcurrent devices. For the purposes of this exception, the term “overcurrent device" means a single or a multipole circuit breaker, or a single fuse or set of fuses in a switch, that can be opened operable or disconnectable by a single operation.

Exception No. 2: Individual protection shall not be required for a panelboard individually supplied on its supply side by not more than two main circuit breakers or two sets of fuses having a combined rating not greater than that of the panelboard. A panelboard wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of this exception, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.

Exception No. 3: For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual residential occupancy.

(A) Snap Switches Rated at 30 Amperes or Less. (No change.)

(B) Supplied Through a Transformer. (Retain existing text in main rule.)

Exception No. 1: A panelboard supplied by the secondary side of a transformer shall be considered as protected by the overcurrent protection provided on the primary side of the transformer where that protection is in accordance with 240.21(C)(1).

Exception No. 2: A panelboard containing not more than six overcurrent devices that is supplied by conductors complying with 240.21(C)(2)(C) shall not be required to have individual overcurrent protection on the supply side.

Exception No. 3: A panelboard containing not more than six overcurrent devices that is supplied by conductors complying with 240.21(C)(2) shall not be required to have individual overcurrent protection on the supply side.

For the purposes of 408.36(B) Exception No. 2 and 3, the term "overcurrent device" means a single or a multipole circuit breaker, or a single fuse or set of fuses in a switch, that can be opened by a single operation.

(C) Delta Breakers. (No change.)

(D) Back-Fed Devices. (No change.)

Substantiation: This Comment is intended to correlate the requirements of permits for exceptions on panelboards that are supplied by certain tap rules or through transformers as presently provided in the Code.

Substantiation for proposed Exception No. 2: The rule for 10-ft secondary conductors in 240.21(C)(2) permits the conductors to terminate in a “device” so long as the conductors have an ampacity not less than the rating of the “device.” In this case, the conductors on the secondary of the transformer are not required to terminate directly in an overcurrent device. Since CMP-9 has primary jurisdiction for overcurrent protection rules for the panelboard, adding the exception to recognize the provisions in 240.21(C)(2) will make the Code more “user-friendly”. Also, overcurrent protection for the panelboard is assured by the requirement in 408.30 that the panelboard be suitable for the calculated load.

Substantiation for proposed Exception No. 3: Note 2 to Tables 450.3(A) and 450.3(B) recognize up to six disconnecting means to be suitable for the overcurrent protection of transformers. Since the rule in 408.36 deals with overcurrent protection of panelboards, the rules need to be correlated. If it is acceptable to have up to six disconnects in one panelboard serve as the overcurrent protection for a service, why not for the secondary of transformers? Also, overcurrent protection for the panelboard is assured by the requirement in 408.30 that the panelboard be suitable for the calculated load. CMP-9 has long equated being suitable for the calculated load as overcurrent protection for power panelboards.

These proposed exceptions do not introduce a new concept as the provisions for overcurrent protection of secondary conductors in 240.21(C)(2) and the Notes to Tables 450.3(A) and 450.3(B) have been in the Code for some time. Correlating the language needs to be here in 408.36 to help the Code be “user friendly.”

Changes are proposed to improve the existing sentence in Exception No. 1 to 408.36 both technically and grammatically. A single fuse or set of fuses need to be in a switch to be operable. The phrase “motion of the hand” begs improvement as one wonders “What kind of a motion of the hand?” Finally, these overcurrent devices may supply a single load or many loads such as a multoutlet lighting or receptacle branch circuit or a feeder to a panelboard that has several branch circuit overcurrent devices.

Since the language relating to six operations for disconnecting means relates to more than just service equipment, it needs to be located where it clearly relates to the entire section.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle in Part

Accept the principle of the suggested changes in Exception No. 1 regarding disconnection through the reference to 230.71. Reject the proposed additional exceptions covering panelboards supplied from transformers.

Panel Statement: The intent of the revisions in 408.36 have been accomplished through the action on Comment 9-70, because the text now points to 230.71 instead of imperfectly restating those rules in this location.

The changes with respect to correlating the 240.21(C) rules with this section have not been previously considered because the second page of the proposal as submitted did not come to the panel and did not have public review. However, CMP 9 notes that wiring what used to be a power panelboard without individual protection to a transformer secondary would not be permitted under the revisions being made in this cycle, because all such panels will be required to have individual protection for the first time. The only permission made available for making such will be when the same effect is achieved through the winding arrangements in the transformer, as covered in what will be 408.36(B).

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-69 Log #1835 NEC-P09 Final Action: Reject (408.36)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 9-117

Recommendation: In the new Exception 2, add the words “Split Bus type panelboard” after the word “fuses”.

Substantiation: Clarifies that Exception 2 is referring to a split bus type panelboard. This term is used in the panel statement.

Panel Meeting Action: Reject

Panel Statement: This description is not required within the NEC text. The panel statement was necessarily descriptive, since it was making a thorough explanation of what was being done.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-70 Log #2268 NEC-P09 Final Action: Accept in Principle (408.36)

Submitter: James Wiseman, Schneider Electric / Square D

Comment on Proposal No: 9-117

Recommendation: Proposal 9-117 should continue to be Accepted in Principle, but the Exceptions need revisions. 408.36 should be revised as follows:

408.36 Overcurrent Protection. In addition to the requirements of 408.30, a panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

Exception No. 1: Individual protection shall not be required for a panelboard used as service equipment with multiple disconnecting means in accordance with 230.71, and containing not more than six overcurrent devices. For the purposes of this exception, the term “overcurrent device” means a single or a multipole circuit breaker, or a single fuse or set of fuses, operable or disconnectable by a single motion of the hand and that supplies a single load. Each circuit breaker or fused switch that is part of the disconnecting means, and which protects a circuit having a grounded conductor, shall be rated greater than 30 amperes. In panelboards protected by three or more main circuit breakers or sets of fuses, the circuit breakers or sets of fuses shall not feed a second bus structure within the same panelboard assembly.

Exception No. 2: Individual protection shall not be required for a panelboard containing not more than six main circuit breakers or two sets of fuses having a combined rating not greater than that of the panelboard. A panelboard constructed or wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of this exception determining the maximum of 42 overcurrent devices, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.

Exception No. 3: For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual residential occupancy.

Substantiation: The text of the main rule is acceptable as worded in the Panel Action.

Exception No. 1 - The first sentence of the proposed exception should return to wording similar to the original Exception to 408.36(B), in order to regain proper tie to the requirements of 230.71. This gives the proper rules for the disconnects and removes the need to attempt clarification of overcurrent protection requirements. (These are Service Equipment panelboards, in which the overcurrent protection is achieved through rules for loading.)

Eliminating the lighting and appliance panelboard rules has inadvertently resulted in permitting service disconnects to be rated 30 ampere or less in a multiple-disconnect service panelboard. Exception 1 as written in the ROP would permit, for example, a service of (6) – 20A single pole circuit breakers.
Exception No. 1: Individual protection shall not be required for a panelboard within the same enclosure. The proposed new third sentence addresses that more clearly.

Exception No. 2 - Deleting the words “individually” and “not more than” makes the wording of this exception better fit with the rest of the revised Section. Adding the words “constructed or” acknowledges the fact that panelboards normally will be built in this manner – not wired into the configuration. Changes to the last sentence are to make the “definition” for overcurrent devices apply only to the maximum count. As written, the definition would also apply to mains, in the first sentence, resulting in a single 2-pole main being the most that is permitted.

Exception No. 3 - This exception is no longer necessary. It was added to the NEC a number of years ago, to help clarify changes to the rules that previously permitted split-bus service panelboards having more than two mains. It has outlived its purpose.

Panel Meeting Action: Accept in Principle
Delete the second sentence of exception 1 in Comment 9-70. Exception 3 is to be retained. The final language is to read as follows:

408.36 Overcurrent Protection. In addition to the requirements of 408.30, a panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

Exception No. 1: Individual protection shall not be required for a panelboard used as service equipment with multiple disconnecting means in accordance with 230.71. In panelboards protected by three or more main circuit breakers or sets of fuses, the circuit breakers or sets of fuses shall not supply a second bus structure within the same panelboard assembly.

Exception No. 2: Individual protection shall not be required for a panelboard protected on its supply side by two main circuit breakers or two sets of fuses having a combined rating not greater than that of the panelboard. A panelboard constructed or wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of determining the maximum of 42 overcurrent devices, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.

Exception No. 3: For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual residential occupancy.

Panel Statement: The changes retain concepts from the 2005 NEC that were not addressed in either the original proposal or the panel action at the ROP meeting. The comment introduced new material because there was also no indication of intent to remove Exception No. 3 that could have been considered for public comment.

CMP 9 has broadened the present 408.36(B) Exception (Exception No. 1 in the new language) to apply to all panels in these limited service applications where greater inspectional supervision is normally expected. This action appropriately follows from the policy decision to remove the distinction between lighting and appliance branch circuit panelboards and power panelboards.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

11-7 Log #701 NEC-P09 Final Action: Accept in Principle (408.36 Exception No. 1)

Submitter: Michael J. Johnston, Plano, TX
Comment on Proposal No: 9-117
Recommendation: As proposed by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard. The exception, as proposed introduces the concept of motions of the hand, which may lead to varying differences in application in this field. The exception should refer to the equipment and characteristics of the equipment or installation rather than how many moves of the hand it takes to operate a service disconnect or multiple service disconnects grouped together in the same enclosure.

Panel Meeting Action: Accept in Principle
Refer to the panel action and statement on Proposal 9-70, which address the submitter’s concern.

Panel Statement: CMP 9 takes this opportunity to note that 230.71(B) specifically refers to motions of the hand.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

11-7 Log #971 NEC-P09 Final Action: Accept in Principle (408.36(B))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 9-121
Recommendation: Change the last sentence “…and the neutral conductor that with the voltage being less that the nominal voltage between the ungrounded conductors.”

408.36(B) Power Panelboard Protection. In addition to the requirements of 408.30, a power panelboard with supply conductors that include a neutral conductor, and having more than 10 percent of its overcurrent devices protecting branch circuits rated 30 amperes or less, shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard. To qualify for this classification, the panelboard shall be supplied by no fewer than two ungrounded conductors that have an equal nominal voltage between them and the neutral conductor that with the voltage being less that the nominal voltage between the ungrounded conductors.

Substantiation: This change provides corrected text for the added final sentence.

Panel Meeting Action: Accept in Principle
Make no changes other than those incorporated in the panel action on Proposal 9-70.

Panel Statement: The comment addresses a provision that is being removed through the acceptance of Proposal 9-117 and Comment 9-70.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-73 Log #1507 NEC-P09 Final Action: Accept in Principle (408.36(B))

Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc.
Comment on Proposal No: 9-121
Recommendation: If action to delete text that uses the term “neutral” is not accepted then use the wording accepted by the Panel.

Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.” Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC), Paul Dobrowsky (CMP 5), Walter Skuggevi (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP2), Jim Daly (CMP 6, CMP 7, TCC), Bill Laidler (CMP 6), and Oran Post (CMP 6). The TCC directed that the action on this proposal be sent to the TG for review and comment.

The TG takes no position on proposal 9-117, however TG concurs with the proposed wording if CMP 9 chooses to retain 408.36(B).

Panel Meeting Action: Accept in Principle
Make no changes other than those incorporated in the panel action on Proposal 9-70.

Panel Statement: The comment addresses a provision that is being removed through the acceptance of Proposal 9-117 and Comment 9-70.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

11-1 Log #2325 NEC-P11 Final Action: Accept (409.104(B))

Submitter: David Fisher, Rockwell Automation
Comment on Proposal No: 11-8
Recommendation: Revise text to read as follows: 409.104 Wiring Space in Industrial Control Panels.

(B) Wire Bending Space. Wire bending space for the main supply terminals shall be in accordance with the requirements in 312.6. Wire bending space within industrial control panels or other field wiring terminals shall be in accordance with the requirements in 430.10(B). The gutter space shall comply with 431.2.

Substantiation: The proposal should have been accepted in principle for the following reasons:

1. 312.6 offers two wire bending options with a number of exceptions. The options necessitate the knowledge of where the field connected conductors will enter the enclosure. This is seldom known at the time of the placement of the components in an industrial control panel unless it is field assembled at the installation site. A panel assembler remote from the installation could comply with the requirements of 312.6 by placing the components in a panel suitable for conductor entry at 90° to the component terminals, effectively allowing
only about one half the space required for a “straight in” entry that might be
needed at the installation. Such a misapplication can’t happen with the wire
bending space according to Table 430.10(B) since its spacing requirements
account for the worst case installation. Further, the panel statement indicating
that 312.6 provides “increased wire bending space for supply terminals” seems
to imply an advantage, but that would only be true if there was evidence
that the spacings required in Table 430.10(B) did not provide adequate wire
bending space for supply terminals. The spacings shown in Table 430.10(B)
have been unchanged for years and have been applied for all types of field
connected terminals and there was no proposal to change them during this code
cycle.
2. The existing text in the second sentence “for other terminals” is ambiguous
as to whether these “terminals” are for field connection or those that are
interconnected with other components in the panel during its assembly and
wiring. The changing to the revised text “for field wiring terminals” mitigates
this problem.
3. The last sentence should have been eliminated from 409.104(B), as
proposed, since the gutter requirements in 312.8 are essentially part of the
409.104(A) existing text.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

18-49 Log #218 NEC-P18 Final Action: Accept
(410.2)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 18-49
Recommendation: The Technical Correlating Committee directs that the Panel
clarify the Panel Action on this Proposal and correlate with the action taken
on Proposal 18-43. This action will be considered by the Panel as a Public
Comment.
Substantiation: This is a direction from the National Electrical Code Technical
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Panel Meeting Action: Accept
Delete 410.2 in the 2005 NEC. This action also deletes 410.3 and its associated
table as accepted in Proposal 18-43.
Panel Statement: The panel has reconsidered their action on Proposals 18-43,
18-48 and 18-49 and concludes that in this section it is not necessary to have
any cross-references to other articles in the NEC.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 410 — LUMINAIRES (LIGHTING FIXTURES),
LAMPHOLDERS, AND LAMPS

18-59 Log #2106 NEC-P18 Final Action: Accept in Principle
(410)

Submitter: Michael S. O’Boyle, Lightolier Division of the Genlyte Group,
LLC
Comment on Proposal No: 18-40a
Recommendation: Revise text to read as follows:
410.10 Spacings. Spacings between live bare metal parts in feeder circuits
shall not be less than specified in Table 430.97.
Exception: Spacings shall be permitted to be less than those
that specified in Table 430.97 at circuit breakers and switches and as otherwise
permitted in listed components installed in industrial control panels.
Substantiation: The UL508A Industrial Control Panel standard provides
requirements for minimum spacing of components in feeder circuits. The
present wording of the exception in proposal 11-9 could potentially conflict
with those requirements in that it could permit use of listed components in
feeder circuits with smaller spacings than those required of UL508A, as well
as prevent use of components in feeder circuits that would be otherwise be
acceptable. The changes submitted would help ensure consistency of permitted
spacings within field built and listed industrial control panels. In addition, the
term “the distance” in the exception should be revised to “spacings” to align
with the requirement text.
Panel Meeting Action: Accept in Part
Change 409.106 to read as follows:
409.106 Spacings. Spacings between live bare metal parts in feeder circuits
shall not be less than specified in Table 430.97.
Exception: Spacings shall be permitted to be less than those specified in
Table 430.97 at circuit breakers and switches and in listed components installed in
industrial control panels.
Panel Statement: The panel accepts the change in terminology from
distance to spacing and from that to those.
The panel rejects the second part of the submitter’s exception. The panel’s intent is to allow for “listed parts” installed in industrial control panels to be
permitted a smaller spacing if that particular part was listed with a smaller
spacing due to its particular construction. The spacing requirements in UL
508A are consistent with the spacing requirements in Table 430.97.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

18-60 Log #217 NEC-P18 Final Action: Accept
(410.2)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 18-48
Recommendation: The Technical Correlating Committee directs that the Panel
clarify the Panel Action on this Proposal and correlate with the action taken
on Proposal 18-43. This action will be considered by the Panel as a Public
Comment.
Substantiation: This is a direction from the National Electrical Code Technical
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Panel Meeting Action: Accept
Delete 410.2 in the 2005 NEC. This action also deletes 410.3 and its associated
table as accepted in Proposal 18-43.
Panel Statement: The panel has reconsidered their action on Proposals 18-43,
18-48 and 18-49 and concludes that in this section it is not necessary to have
any cross-references to other articles in the NEC.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 410 — LUMINAIRES (LIGHTING FIXTURES),
LAMPHOLDERS, AND LAMPS

18-61 Log #218 NEC-P18 Final Action: Accept
(410.2)

Submitter: Michael S. O’Boyle, Lightolier Division of the Genlyte Group,
LLC
Comment on Proposal No: 18-40a
Recommendation: Revise text to read as follows:
410.10 Spacings. Spacings between live bare metal parts in feeder circuits
shall not be less than specified in Table 430.97.
Exception: Spacings shall be permitted to be less than those specified in
Table 430.97 at circuit breakers and switches and as otherwise
permitted in listed components installed in industrial control panels.
Substantiation: The UL508A Industrial Control Panel standard provides
requirements for minimum spacing of components in feeder circuits. The
present wording of the exception in proposal 11-9 could potentially conflict
with those requirements in that it could permit use of listed components in
feeder circuits with smaller spacings than those required of UL508A, as well
as prevent use of components in feeder circuits that would be otherwise be
acceptable. The changes submitted would help ensure consistency of permitted
spacings within field built and listed industrial control panels. In addition, the
term “the distance” in the exception should be revised to “spacings” to align
with the requirement text.
Panel Meeting Action: Accept in Part
Change 409.106 to read as follows:
409.106 Spacings. Spacings between live bare metal parts in feeder circuits
shall not be less than specified in Table 430.97.
Exception: Spacings shall be permitted to be less than those specified in
Table 430.97 at circuit breakers and switches and in listed components installed in
industrial control panels.
Panel Statement: The panel accepts the change in terminology from
distance to spacing and from that to those.
The panel rejects the second part of the submitter’s exception. The panel’s intent is to allow for “listed parts” installed in industrial control panels to be
permitted a smaller spacing if that particular part was listed with a smaller
spacing due to its particular construction. The spacing requirements in UL
508A are consistent with the spacing requirements in Table 430.97.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

ARTICLE 410 — LUMINAIRES (LIGHTING FIXTURES),
LAMPHOLDERS, AND LAMPS

18-62 Log #214 NEC-P18 Final Action: Accept
(410.2)

Submitter: Michael S. O’Boyle, Lightolier Division of the Genlyte Group,
LLC
Comment on Proposal No: 18-40a
Recommendation: Revise text to read as follows:
410.10 Spacings. Spacings between live bare metal parts in feeder circuits
shall not be less than specified in Table 430.97.
Exception: Spacings shall be permitted to be less than those specified in
Table 430.97 at circuit breakers and switches and in listed components installed in
industrial control panels.
Panel Statement: The panel accepts the change in terminology from
distance to spacing and from that to those.
The panel rejects the second part of the submitter’s exception. The panel’s intent is to allow for “listed parts” installed in industrial control panels to be
permitted a smaller spacing if that particular part was listed with a smaller
spacing due to its particular construction. The spacing requirements in UL
508A are consistent with the spacing requirements in Table 430.97.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

ARTICLE 410 — LUMINAIRES (LIGHTING FIXTURES),
LAMPHOLDERS, AND LAMPS

18-63 Log #592 NEC-P18 Final Action: Reject
(410.4(d))

N.C. Ellis Cannady Chapter of I.A.E.I
Comment on Proposal No: 18-51
Recommendation: We support the proposal.
Substantiation: None given.
Panel Meeting Action: Reject
Panel Statement: The comment is rejected because it fails to comply with
Section 4.4.5(d) of the Regulations Governing Committee Projects since there is
no substantiation offered to support the comment. The panel notes that the
action on this comment does not change their accept action on Proposal 18-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-64 Log #1211 NEC-P18 Final Action: Reject (410.4(D))

Submitter: James W. Carpenter, International Association of Electrical Inspectors
Comment on Proposal No: 18-51
Recommendation: We support the panel’s action in Accepting this Proposal as written.
Substantiation: None.
Panel Meeting Action: Rejection
Panel Statement: The comment is rejected because it fails to comply with Section 4.4.5(d) of the Regulations Governing Committee Projects since there is no substantiation offered to support the comment. The panel notes that the action on this comment does not change their accept action on Proposal 18-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
OWENS, T.: I think the appropriate action on this comment is accept. CMP-
18-50a

18-65 Log #2188 NEC-P15 Final Action: Accept in Principle (410.6, 410.27(B) & (C), 410.30(C), and 410.30(C)(1)(2)(c))

Submitter: Frederick L. Carpenter, Lithonia Lighting
Comment on Proposal No: 18-40a
Recommendation: Change the proposed text to read as follows:
410.xx Listing Required. All luminaires and lampholders and lighting assemblies shall be listed.
Additionally, the text of 410.27(B), 410.27(C), 410.30(C)(1), and 410.30(C)(1)(2)(c) should be modified by adding the word “listed” back into the sections as shown below:
410.27(B) Size Unless part of listed decorative lighting assemblies, pendant conductors shall not be smaller than 14 AWG for mogul-base or medium-base screw-shell lampholders or smaller than 18 AWG for intermediate or candelabra-base lampholders.
410.27(C) Twisted or Cabled Pendant conductors longer than 900 mm (3 ft) shall be twisted together where not cabled in a listed lighting assembly.
410.30(C)(1) Cord-Connected Installation. A listed lighting assembly shall be permitted to be cord connected if the following conditions apply:
410.30(C)(1)(2)(c) Is terminated in a grounding-type attachment plug cap or busway plug, or is a part of a listed lighting assembly incorporating a manufactured wiring system connector in accordance with 604.6(C), or has a luminaire (fixture) assembly with a strain relief and canopy.
Substantiation: The term “lighting assemblies” is undefined, vague, and likely to lead to a variety of interpretations from different authorities having jurisdiction. Will optional parts that are normally shipped separately from a listed assembly be considered to be lighting assemblies which must carry a listing mark? (For instance, visors or vandal guards). Are poles lighting assemblies? To address this problem, the term “lighting assemblies” should be removed from this proposed general listing requirement, and the requirement for listing should be added back into the appropriate specific sections that previously referenced “listed assemblies”.
Panel Meeting Action: Accept in Principle
Accept the recommendation as submitted with the following revision to 410.30(C)(1):
(1) Cord-Connected Installation. A luminaire or a listed assembly shall be permitted to be cord connected if the following conditions apply: (remainder of 410.30(C)(1) to remain as is in the 2005 NEC)
Panel Statement: The panel accepts the recommendation with the addition of the words “luminaire or” to 410.30(C)(1) to restore the text to that of the 2005 NEC. The panel notes that “fixture” will be removed throughout the NEC based on the TCC direction.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-66 Log #1407 NEC-P18 Final Action: Accept in Principle (410.8(B)(3) (New))

Submitter: Lee Ward, Arcdee Lighting Inc.
Comment on Proposal No: 18-56
Recommendation: This Proposal should be Accepted.
410.8 Luminaries (Fixtures) in Clothes Closets.
(8) Luminarie (Fixture) Types Permitted. Listed luminaries (fixture) of the following types shall be permitted to be installed in a closet:
(1) A surface-mounted or recessed incandescent luminaire (fixture) with a completely enclosed lamp.
(2) A surface-mounted or recessed fluorescent luminaire (fixture).
(3) A listed surface-mounted or wall-mounted clothes rod luminaire installed in accordance with the manufacturer’s installation instructions.
Substantiation: This luminaire or fixture is intended to supply supplemental low voltage or fluorescent lighting to areas of the closet that cannot be reached by conventional fixtures.
The panel statement in the Report on Proposal 18-56 mentioned that “There currently are no tests in the luminaire standard, ANSI/UL 1598, that determine the suitability of a luminaire for use in a clothes closet”. Panel Rejected the Proposal.
Since receiving the ROP, an independent test lab tested the clothes rod luminaire in an IC test box built to simulate a worse case situation in the storage area of a clothes closet. All external surfaces are less than 90°C which is a requirement in UL 1598. These tests were witnessed by UL. We feel that the clothes rod luminaire listed Type IC should be permitted for use in the storage area of a clothes closet.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Accept in Principle
Revise 410.8 by adding the following:
410.8(B)(3) Surface mounted fluorescent or LED luminaires identified as suitable for installation within the storage area.
410.8(D)(5) Surface mounted fluorescent or LED luminaires shall be permitted to be installed within the storage space where identified for this use.
Panel Statement: The panel action allows for the use of listed luminaires that can be installed within the storage area of a clothes closet.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-67 Log #2220 NEC-P18 Final Action: Accept (410.10(B))

Submitter: Jeff FitzZoff, State of Idaho Division of Building Safety
Comment on Proposal No: 18-40a,
Recommendation: Revise text to read as follows:
(D) Bathhtub and Shower Areas. No parts of cord connected luminaires, chain-, cable-, or cord-suspended luminaires, lighting track, pendants, or ceiling-suspended (paddle) fans shall be located within a zone measured 900 mm (3 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower stall threshold. This zone is all encompassing and includes the space directly over the tub or shower stall. Luminaires located within the actual outside dimension of the bathtub or shower to a height of 2.5 m (8 ft) vertically from the top of the bathtub rim or shower threshold shall be marked for damp locations, or marked for wet locations where subject to shower spray. [ROP 18-40a, 18-50a]
Substantiation: This change helps to clearly identify the location and the requirements for lights in showers and bathtubs.
Panel Meeting Action: Accept
Panel Statement: The panel notes that the correct proposal references shown in the recommendation should be 18-40a and 18-51, not 18-40a and 18-50a.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-68 Log #416 NEC-P18 Final Action: Reject (410.14(B))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 18-66
Recommendation: Accept proposal.
Panel Statement: The definition of “concealed” in Article 100 is rendered inaccessible. 314.29 requires boxes to be accessible. The requirements of this section provide for access. How can a box be inaccessible (concealed) when access is provided?
Panel Meeting Action: Reject
Panel Statement: The panel reiterates that 314.29 requires “Boxes shall be installed so that the wiring contained in them can be rendered accessible without removing any part of the building.” Clearly the box may be concealed whereas the wire must be accessible. The intent of 410.14(B) is to render the wiring in the box accessible without the removal of an independently (not to the box) supported electric discharge luminaire.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Report on Comments A2007 — Copyright, NFPA

18-69 Log #273 NEC-P18
Final Action: Reject
(410.18(B) Exception No. 2)

Submitter: Dennis Downer, Morrisville, VT

Comment on Proposal No: 18-41
Recommendation: Delete Exception No. 2 of 410.18(B).
410.18 Exposed Luminarie (Fixture) Parts.
(B) Made of Insulating Material Luminaries (fixtures) directly wired or
attached to outlets supplied by a wiring method that does not provide a ready
means for grounding shall be made of insulating material and shall have no
exposed conductive parts.

Exception No. 2: Where no equipment grounding conductor exists at the
outlet, replacement (reinstall) luminaries (fixtures) that are GFCI-protected shall not be
required to be connected to an equipment grounding conductor.

Substantiation: This was added to the 2005 NEC and as noted in NEC
handbooks and Code update presentation as similar protection as provided for
receptacles. This is not the same, receptacles are installed in the wall were no
parts are exposed to the general public, but a Luminarie could have ground
fault by means of a nicked wire in the fixture box and because there is no
grounding conductor the fixture could become energized and sit there waiting
for the first person to come along and touch the fixture and have to receive a
shock in order to trip the GFCI protecting the fixture. Also, the person could
be on an aluminum ladder and receive this shock and jump also introducing a
fall hazard. Yes, I know this provides a least some protection, but I believe it
should be installed according to the main text or Exception No. 1, but not allow
Exception 2.

Panel Meeting Action: Reject
Panel Statement: In accordance with 4-4.6 of the Regulations Governing
Committee Projects, the panel is to consider and act on all comments that are
directly related to the substantive content of the Report on Proposals. Since
there were no proposals on Section 410.18(B) Exception No. 2, the panel is
rejecting this comment. Proposal 18-41 was simply a reorganization of Article
410 and did not address any technical issues.

The panel rejects the substantiation for deleting Exception No. 2 to
410.18(B). In response to this substantiation, a luminaire installed to a box
without an equipment grounding conductor is not any different than a luminaire
plugged into a receptacle without an equipment grounding conductor. Both
cases require GFCI protection and provide the same level of protection.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-70 Log #1977 NEC-P18
Final Action: Reject
(410.30(C)(1)(2)(c))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 18-78
Recommendation: This Proposal should have been Rejected.

Substantiation: While the proposal may address the prohibition of running a
cord through a hole in a ceiling by installing it in a raceway, it does not address
other potential conflicts and will still be seen as a code violation by many AHJs. For example, 400.8 also prohibits the cord being above the suspended
or dropped ceiling and from being used as a substitute for fixed wiring. In
addition, it prohibits the installation of cord in a raceway. Admittedly, this
proposal would overcome that prohibition by specifically permitting it.
However, other aspects of the installation are not addressed by the proposal:

1. The wording implies that the raceway is for attachment to an outlet above
the ceiling, but that is not clear. (2) If the cord is to emerge from the raceway,
how is this transition made, and how is the cord protected? A better solution
would be to devise a box that could be installed over the grid member, or to
use a flexible raceway or cable for the connection, so that the provisions of
400.8 do not have to be violated.

Panel Meeting Action: Reject
Panel Statement: See panel action on Comment 18-77. Proposal 18-78
requires that the raceway be attached to an outlet box above the ceiling.
The cord would emerge from the raceway into the outlet box and be totally
exposed and protected.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-71 Log #2185 NEC-P18
Final Action: Accept
(410.31)

Submitter: Frederick L. Carpenter, Lithonia Lighting

Comment on Proposal No: 18-40a
Recommendation: Return the text of 410.31 to the text in the 2005 NEC by
adding the word “listed” as shown below:

410.31 Luminaries as Raceways. Luminaries shall not be used as a raceway
for circuit conductors unless listed and marked for use as a raceway.

Substantiation: The use of the word “listed” is necessary to indicate that the
products being discussed need to be listed for a specific requirement, in
addition to the general requirements for listed luminaires. The word “listed”
needs to remain in this section to clearly identify that listing as a raceway is
required. When the panel removed the word “listed” from this section because
they added a general requirement for listing luminaires elsewhere in the article,
the intent of this section lost clarity.

Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-72 Log #2186 NEC-P18
Final Action: Accept
(410.32)

Submitter: Frederick L. Carpenter, Lithonia Lighting

Comment on Proposal No: 18-40a
Recommendation: Return the text of 410.32 to the text in the 2005 NEC by
adding the word “listed” as shown below:

410.32 Wiring Supplying Luminaries Connected Together. Luminaries
designed for end-to-end connection to form a continuous assembly, or
luminaries connected together by recognized wiring methods, shall be
required to contain the conductors of a 2-wire branch circuit, switching the
connected luminaires and need not be listed marked as a raceway. One additional 2-wire branch circuit separately supplying one or more of the connected luminaires shall also be permitted.

Substantiation: The use of the word “listed” in 410.32 is necessary to indicate that the products being discussed need to be listed for a specific requirement, in addition to the general requirements for listed luminaries. The word “listed” needs to remain in this section to clearly identify that listing as a raceway is required. When the panel removed the word “listed” from this section because they added a general requirement for listing luminaires elsewhere in the article, the intent of this section lost clarity.

Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-73 Log #440 NEC-P18
Final Action: Reject
(410.33)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 18-79
Recommendation: Revise panel action:

Feeder and branch circuit conductors within 75 mm (3 in.) of a ballast shall
have a temperature rating not lower than marked on the ballast or luminaire,
(fixture) and not lower than 90°C (194°F) unless supplying a ballast or
luminaire (fixture) listed and marked for a different lower temperature.

Substantiation: Definition of luminaire indicates it is a complete unit
(singular) that may contain a ballast. Where the ballast is remote the luminaire
may have a temperature marking lower than 90°C. Literal wording does not
permit a feeder or branch circuit which does NOT supply a luminaire with
lower temperature rating requirements to be less than 90°C and permits a lower
than 90°C rating if the marking is for a HIGHER (different) than 90°C rating.

Panel Meeting Action: Reject
Panel Statement: The temperature limit on the enclosure of a listed Class P
ballast is 90°C. Some ballast manufacturers mark electronic ballasts with a
maximum temperature limit that is less than 90°C for warranty purposes. This is
a ballast manufacturer declared value and is not related to the testing performed
for safety certification.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-74 Log #2187 NEC-P18
Final Action: Reject
(410.35)

Submitter: Frederick L. Carpenter, Lithonia Lighting

Comment on Proposal No: 18-79a
Recommendation: Proposal 18-79a should be Rejected and the text should be
returned to the text of 410.35 of 2005 NEC if Proposal 18-40a is Rejected.

Substantiation: The substantiation for eliminating the minimum letter height
of this marking because the visibility requirements are already addressed in
the listing standard is only valid if all luminaires are required to be listed.
Currently, the codes do not require listing of all luminaires. If Proposal 18-40a
comes accepted throughout the code revision process, then this Proposal
(18-79a) would be acceptable. However, if Proposal 18-40a is rejected,
Proposal 18-79a should be rejected by the panel and the text should revert to
the text of 410.35 in the 2005 NEC.

Panel Meeting Action: Reject
Panel Statement: The action taken by the panel on Comment 18-65 addresses the
commentor’s concerns with Proposal 18-40a. Therefore, since Proposal
18-40a is being accepted, the concerns raised in this comment have been addressed.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

70-269
18-75 Log #1124 NEC-P18  Final Action: Reject (410.35(A))


Comment on Proposal No: 18-80

Recommendation: Please reconsider this proposal.

Substantiation: This proposal is concerned with branch circuit wiring in old homes. Evidently, the Panel feels that a luminaire that requires conductor insulation to be rated at an ambient temperature of 194 degrees Fahrenheit is OK - Just read the label.

Panel Meeting Action: Reject

Panel Statement: The panel understands that the NEC applies to new installations versus existing older wiring. However, the panel does not agree that markings on luminaires are ineffective. The only way to insure proper installation of a luminaire is through the markings and installation instructions. The panel will not create specialized language to assure those installers who refuse to follow the directions provided by manufacturers.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

18-76 Log #1125 NEC-P18  Final Action: Reject (410.36)


Comment on Proposal No: 18-82

Recommendation: See comment for Proposal 18-80.

Substantiation: The panel claims that "substantial changes have been made to the safety standards over the past 60 years" BUT WE STILL SEE THE LABEL RESTRICTING THE BRANCH CIRCUIT CONDUCTORS TO 75/90C! The Panel comments on new wiring but THE CONCERN IS WITH THE 60 YEAR OLD WIRING.

Panel Meeting Action: Reject

Panel Statement: The panel understands that many existing wiring installations contain the older 60° C rated conductors. It also understands that most new luminaires are marked for 75°/90° C conductors only. The installer of a new luminaire on an older wiring installation must make provisions to upgrade the conductors of the wiring to meet the new luminaire marking. Again, the panel will not create specialized language to assure those installers who refuse to follow the directions provided by manufacturers.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

18-77 Log #905 NEC-P18  Final Action: Reject (410.62(C)(2)(c))

Submitter: Michael Lenherr, Pendant Systems

Comment on Proposal No: 18-78

Recommendation: Delete the following text:

having a maximum 152 mm (6 in.) long section of raceway for attachment to an extended ceiling.

Substantiation: There clearly exists alternatives to produce the inline look of the feed end side suspension on the T-bar of the indirect fluorescent lighting systems in today’s lighting market place. I have provided product information from Pendant Systems, Fnelite and Light Control showing code compliant installations within the workings of 400.8. The typical wiring seen in these documents, as we have seen in the past is the use of a 1/2 in. offset nipple with a bushing on the front of the canopy into a 1900 box mounted sideways on to suspended ceiling grid attached to a IDS type clip. (see photo). This type of installation does not provide strain relief at the canopy location as with the canopy over the junction box at the ceiling level and relies on the contractor to us a UL knot in the 1900 box above the ceiling. It would also be easier for the AHJ to verify cord strain relief at the canopy level as there is the possibility that these fixture may be removed. Also, in the first sentence, change the words “double ended” to “double-ended” and the word “ballast” to “ballast(s)”. In the second sentence, change the word “disconnect” to “disconnecting means”. Section 410.73(G) would read as follows:

(G) Disconnecting Means. In indoor locations, other than dwellings and associated accessory structures, fluorescent luminaires that utilize double-ended, double-ended lamps and contain ballast(s) that can be serviced in place shall have a disconnecting means either internal or external to each luminaire. When connected to multwire branch circuits, the disconnecting means shall simultaneously break all the supply conductors of the ballast, including the grounded conductor. The line side terminals of the disconnecting means shall be guarded. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast. Where the disconnecting means is external to the luminaire, it shall be a single device, located in sight of the luminaire.

Existing five exceptions to remain as written in the 2005 NEC.

Substantiation: The word “associated” was inadvertently changed to “assorted” by the panel. The words “double ended” should be change to “double-ended”, and the word “ballast” should be changed to “ballast(s)” to remain consistent with the previous code language and to clarify that a luminaire may contain more than one ballast.

Panel Meeting Action: Accept in Principle

Revise 410.73(G) to read:

(G) Disconnecting Means.

(1) General. In indoor locations, other than dwellings and associated accessory structures, fluorescent luminaires that utilize double-ended lamps and contain ballast(s) that can be serviced in place shall have a disconnecting means either internal or external to each luminaire. The line side terminals of the disconnecting means shall be guarded.

Exception No. 1: A disconnecting means shall not be required for luminaires installed in hazardous (classified) location(s).

Exception No. 2: A disconnecting means shall not be required for emergency illumination required in 700.16.

Exception No. 3: For cord-and-plug-connected luminaires, an accessible separable connector or an accessible plug and receptacle shall be permitted to serve as the disconnecting means.

Exception No. 4: A disconnecting means shall not be required in industrial establishments with restricted public access where conditions of maintenance and supervision ensure that only qualified persons service the installation by written procedures.

Exception No. 5: Where more than one luminaire is installed and supplied by other than a multwire branch circuit, a disconnecting means shall not be required for every luminaire when the design of the installation includes...
disconnecting means such that the illuminated space cannot be left in total darkness.

(2) Multiwire Branch Circuits. When connected to multiwire branch circuits, the disconnecting means shall simultaneously break all the supply conductors to the ballast, including the grounded circuit conductor.

(3) Location. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast. Where the disconnecting means is external to the luminaire, it shall be a single device, and shall be attached to the luminaire or the luminaire shall be located within sight of the disconnecting means.

Panel Statement: The panel has revised the last sentence of the recommendation regarding the location of the luminaire disconnecting means to clarify that an external disconnecting means is either required to be attached to the luminaire (could be attached to the luminaire and located above an accessible ceiling area) or that the luminaire is required to be located within sight of the disconnecting means. In addition this section has been reorganized in order to place multiple requirements into separate subdivisions. This action also aids the user in understanding the application of the exceptions.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Comment on Affirmative: O’BOYLE, M.: I would like to emphasize that this requirement was promulgated because of reports of unsafe work practice by personnel during their servicing of double ended lamp luminaires. Since no safety device can protect against all of the possible hazards involved in servicing electrical equipment, all personnel involved in such service operations must be cognizant of the fact that the disconnects required by this section should not be relied upon as the primary means of assuring service personnel protection.

Proper servicing techniques, including the de-energizing the branch circuit and or the use of appropriate protective equipment, must be observed by service personnel to ensure safety. These basic safety tenets must continue to be the foundation of training, supervision and work methods employed by those involved with servicing luminaires.

18-80 Log #2108 NEC-P18 Final Action: Accept in Part (410.73(G))
Submitter: Michael S. O’Boyle, Lightolier Division of the Genlyte Group, LLC
Comment on Proposal No: 18-94
Recommendation: Revise text to read as follows:

(410.73(G)) Disconnecting Means. In indoor locations, other than dwellings and associated accessory structures, fluorescent luminaires that utilize double ended lamps and contain ballast that can be serviced in place, supplied by branch circuits with voltage exceeding 150-volts to ground, shall have a disconnecting means either internal or external to each luminaire. When connected to multiwire branch circuits, the disconnect shall simultaneously break all the supply conductors of the ballast, including the grounded conductor. The line side terminals of the disconnecting means shall be guarded. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast. Where the disconnecting means is internal to the luminaire it shall be a single device, located in sight of the luminaire. Existing five exceptions to remain as written in the 2005 NEC.

(Base language is from Proposal 18-90b).
Substantiation: As a function of magnitude, voltages below 150-volts present a lower level of risk than those exceeding 150-volts. 210.5(B) and 210.5(C) recognize this by allowing ordinary screwshell lampholders with accessible live parts or components or ‘assemblies’ might be considered to be covered by this term by various Authorities Having Jurisdiction.

18-81 Log #2144 NEC-P18 Final Action: Reject (410.73(G))
Submitter: Gary Martin, Brite Electric
Comment on Proposal No: 18-90b
Recommendation: Revise text to read as follows:

Fluorescent luminaires that utilize double ended lamps and contain ballast that can be serviced in place.

Substantiation: This is a serious problem, not only on luminaires with double ended lamps, but on all luminaires where the ballast can be serviced in place.

Panel Meeting Action: Reject
Panel Statement: The commenter has provided no data to substantiate his claim that the unsafe work practice of replacing ballasts without first disconnecting power is a serious problem on all luminaire types where the ballast can be serviced in place. The provisions of 410.73(G) were adopted to address an unsafe work practice that involved people performing maintenance on linear fluorescent luminaires without first disconnecting power or using the appropriate personal protective equipment. It is hoped that the requirements of 410.73(G) will minimize the number of shock incidents associated with this unsafe work practice, but the requirements are not intended to circumvent the need to wear the appropriate personal protective equipment or to disconnect power before servicing live electrical equipment.

Extending the requirements of 410.73(G) to luminaires other than linear fluorescent luminaires would expose the workers to greater risks from additional shock hazards since other types of electric-discharge lighting systems are more likely to have exposed live electrical parts located within the electrical enclosure, such as exposed capacitor terminals, core & coil (open-coil) ballasts, open-coil relays, open-board starters, etc.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-82 Log #2145 NEC-P18 Final Action: Reject (410.73(G))
Submitter: Steve Egyed, H & G Services
Comment on Proposal No: 18-92
Recommendation: Delete the following text:

And installed on branch circuits with voltages exceeding 150 volts to ground

Substantiation: Luminaires operating at 120 volts to ground are just as hazardous as those of higher voltages as they produce a hold current that prevents one from letting go of.

Panel Meeting Action: Reject
Panel Statement: The panel did not accept that part of Proposal 18-92 limiting the disconnecting means requirement to luminaires installed on circuits over 150 volts. See the panel action on Comment 18-80.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-83 Log #2303 NEC-P18 Final Action: Accept in Principle (410.73(G))
Submitter: Edward Yandek, GE Lighting
Comment on Proposal No: 18-90b
Recommendation: I support this proposal as written and recommend it be adopted.

Substantiation: This proposal improves previously identified technical issues with the requirements in 410.73(G). It would make the requirements more practical to implement. It also properly limits application of the requirements to luminaire types for which there are incident reports.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 18-79.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-84 Log #2306 NEC-P18 Final Action: Reject (410.73(G))
Submitter: Edward Yandek, GE Lighting
Comment on Proposal No: 18-40a
Recommendation: Reject adoption of this Proposal.

Substantiation: The term ‘lighting assembly’ is not defined. Without a sufficient definition this term has no inherently clear or consistent meaning. Adoption would present an unacceptable situation for manufacturers and installers since it would lead to inconsistent interpretations on what equipment parts or components or ‘assemblies’ might be considered to be covered by this term by various Authorities Having Jurisdiction.
Panel Meeting Action: Reject
Panel Statement: The issues raised by the commenter have been addressed by the panel action and panel statement on Comment 18-65. The panel notes that the section (410.73(G)) referenced in the comment is incorrect.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-85 Log #2308 NEC-P18 Final Action: Reject
(410.73(G))

Submitter: Edward Yandek, GE Lighting
Comment on Proposal No: 18-92
Recommendation: This proposal would limit requirements to luminaires greater than 150 volts-to-ground. This limitation should be adopted.
Substantiation: Incident data presented previously by the Electrical Safety Authority of Canada would support limiting provisions to luminaires that are greater than 150 volts-to-ground. This would also harmonize requirements in the NEC with requirements in the Canadian Electrical Code, which would result in a more practical ability of manufacturers to develop consistent product implementation schemes.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-80.
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative: CARPENTER, F.: See my explanation of negative vote on Comment 18-80.

18-86 Log #2309 NEC-P18 Final Action: Reject
(410.73(G))

Submitter: Edward Yandek, GE Lighting
Comment on Proposal No: 18-93
Recommendation: This proposal would limit the requirements to luminaires greater than 150 volts-to-ground. This limitation should be adopted.
Substantiation: Incident data presented previously by the Electrical Safety Authority of Canada would support limiting provisions to luminaires that are greater than 150 volts-to-ground. This would also harmonize requirements in the NEC with requirements in the Canadian Electrical Code, which would result in a more practical ability of manufacturers to develop consistent product implementation schemes.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-80.
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative: CARPENTER, F.: See my explanation of negative vote on Comment 18-80.

18-87 Log #786 NEC-P18 Final Action: Reject
(410.73(G), [410.120(G)])

Submitter: Michael J. Johnston, Plano, TX
Comment on Proposal No: 18-90b
Recommendation: Accept in Principle the proposed text in 18-91 and revise the proposed last sentence of 410.73(G) as follows:

Where the disconnecting means is external to the luminaire, it shall be readily accessible from the luminaire.

Substantiation: Proposal 18-91 (Log #489) is an effort to clarify the external disconnecting means location while at the same time maintaining the spirit and objective of the original rule accepted in the 2005 NEC cycle, which is worker safety. The substantiation provided with proposals 18-92 (Log #1780) and 18-93 (Log #3421) in the 2004 ROP indicated the need for a means of disconnecting for workstring purposes. The location of such disconnecting means is an important part of this requirement to achieve the primary objective of the original requirement. The action on Proposal 18-90b actually results in lessening the requirements gained in 410.73(G) of the 2005 NEC. Perhaps this is what CMP-18 intends. Based on the actions and resulting requirements in the 2005 NEC, CMP-18 intended requirements that would provide workers a ready means for disconnecting power to ballasts during service operations that would reduce the risks that are currently being taken by workers in the field faced with these decisions. While it was clear that CMP-18 does not condone unsafe work practices, the requirements in 410.73(G) have been reduced as a result of inserting the concept of location a disconnect “in sight” of the luminaire in this section. By definition, this allows the disconnect to be visible from and up to 50 ft away from the luminaire which invites the risks that the original rule was intended to reduce. The general requirements of this section should be geared toward providing a ready means to establish an electrically safe work condition for workers on ladders, lifts, and so forth, and the exceptions to this rule should relax the requirement under specific alternatives that offer equal and effective means for providing equivalent safety objectives. Consider the proposed adjustment or reject the original proposal to revert back to the 2005 language.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree that the action taken on Proposal 18-90b lessens the requirements of 410.73(G). The revisions in Proposal 18-90b and Comment 18-79 now require the disconnecting means to be either attached to the luminaire or that the luminaire is within sight of the disconnecting means. In accordance with the 2005 NEC the disconnecting means could have been located anywhere in the building. Locating an external disconnecting means within sight accomplishes the objective of allowing the luminaire that needs to be serviced to be disconnected from the branch circuit without rendering the entire space dark. The panel did not intend that the disconnecting means has to be readily accessible from the luminaire in those case where a luminaire is within sight of a local switch used as the disconnecting means. See the panel action on Comment 18-79.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-88 Log #977 NEC-P18 Final Action: Accept in Principle
(410.101(B))

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 18-65
Recommendation: Replace the word “fixtures” with “luminaires” in the newly added Fine Print Note as follows:

410.101 Installation. (B) Connected Load. The connected load on lighting track shall not exceed the rating of the track. Lighting track shall be supplied by a branch circuit having a rating not more than that of the track.

FPN: The load calculation in 220.43(B) is not intended to limit the number of feet of track on a single branch circuit nor is it intended to limit the number of fixtures on an individual track.
Substantiation: The word “fixtures” was replaced with “luminaires” to make it consistent with the remainder of the NEC.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel action on Comment 18-89 addresses the recommendation.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-89 Log #1944 NEC-P18 Final Action: Accept
(410.101(B), FPN )

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-65
Recommendation: Revise as follows:

FPN: The load calculation in 220.43(B) does not limit the length of track on a single branch circuit, and it does not limit the number of luminaires on single track.
Substantiation: This rewording omits statements of intent, changes “fixtures” to “luminaires”, and by using “length” instead of “number of feet” avoids a metrical problem.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-90 Log #474 NEC-P18 Final Action: Hold
(410.130(G))

Submitter: Gregory J. Steinman, Thomas & Betts Corporation
Comment on Proposal No: 18-90b
Recommendation: Revise as follows:

(G) Disconnecting Means. In indoor locations, other than dwellings and associated accessory structures, fluorescent luminaires that utilize double-ended lamps and contain ballast(s) that can be serviced in place shall have a disconnecting means either internal or external to each luminaire. For existing installed luminaires without disconnecting means, at the time a ballast is replaced, a disconnecting means shall be installed. When connected to multwire branch circuits, the disconnect shall simultaneously break all the supply conductors of the ballast, including the grounded conductor. The line side terminals of the disconnecting means shall be guarded. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast. Where the disconnecting means is external to the luminaire, it shall be a single device, located in sight of adjacent to the luminaire.
Substantiation: Disconnecting means provide a safe working environment for the electrician. It can be added easily at the time a ballast is replaced and will provide a safer installation of the next ballast replacement. There are several ballast disconnecting components available that can be easily installed during ballast replacement. Per Article 100, the words “in sight of” mean within 50 feet. This is too far for a safe replacement. The disconnecting means shall be easily accessible to the electrician.
Panel Meeting Action: Hold
Panel Statement: In accordance with 4.4.6.2.2 and 4.4.6.2.3 of the Regulations Governing Committee Projects, this comment is being held because it introduces new material that has not had adequate public review.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
ARTICLE 411 — LIGHTING SYSTEMS OPERATING AT 30 VOLTS OR LESS

18-91 Log #974 NEC-P18 Final Action: Accept in Principle (411.2)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.
Comment on Proposal No: 18-105
Recommendation: Delete “shall each be” and replace with the word “are” to read as follows:

Lighting Systems Operating at 30 Volts or Less. A lighting system consisting of an isolating power supply, the low voltage luminaires (lighting fixtures), and associated equipment, all identified for the use. The output circuits of the power supply are shall each be rated for not more than 25 amperes and operate at 30 volts (42.4 volts peak) or less under all load conditions.

Substantiation: The NEC Style Manual does not permit mandatory text in a definition so the mandatory text is being replaced with the word “are.”

Panel Meeting Action: Accept in Principle
Revise 411.2 to read:

Lighting Systems Operating at 30 Volts or Less. A lighting system consisting of an isolating power supply, the low voltage luminaires, and associated equipment, all identified for the use. The output circuits of the power supply are shall each be rated for not more than 25 amperes and operate at 30 volts (42.4 volts peak) or less under all load conditions.

Panel Statement: The panel has made an editorial revision in the first sentence and has also deleted the term (lighting fixture).

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-92 Log #219 NEC-P18 Final Action: Accept (411.3)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 18-106
Recommendation: The Technical Correlating Committee directs that the Panel reconsider the proposal and add headings to (A) and (B). This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Make the following revisions to 411.3:

Listing Required. Lighting systems operating at 30 volts or less shall comply with 411.3(A) or 411.3(B)

(A) Listed System. Lighting systems operating at 30 volts or less shall be listed as a complete system. The luminaires, power supply and luminaire fittings (including the exposed bare conductors) of an exposed bare conductor lighting system shall be listed for the use as part of the same identified lighting system.

(B) Assembly of Listed Parts. A lighting system assembled from the following listed parts shall be permitted.

Retain existing list items (1) through (6)
Panel Statement: The panel has added headings as directed and has also revised and reorganized the text to clarify application.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-93 Log #1876 NEC-P18 Final Action: Reject (411.4)

Submitter: Steven D. Holmes, Underwriters Laboratories Inc.
Comment on Proposal No: 18-107
Recommendation: Accept 411.4(B) as proposed.

Substantiation: This proposal should be ACCEPTED IN PRINCIPLE. We agree with the Panel action except for the rejection of the proposed text of 411.4(B). The panel concluded the proposed text of 411.4(B) was in conflict with, and less stringent than, the requirements of Section 680.22(B). Regrettably, the NFPA panel did not identify in the panel statement which of the multiple requirements that make up 680.22(B) of the 2005 NEC were more stringent than, or in conflict with, the requirements of proposed 411.4(B).

Proposed 411.4(B) required the following:
A) Power supply shall be GFCI protected if less than 10 ft horizontal from pool.
B) All system components less than 5 ft horizontal shall be minimum 12 ft above water.

The following table compares proposed 411.4(B) with each sub-section of 680.22(B).

<table>
<thead>
<tr>
<th>Subsection and scope of 680.22(B) requirements for luminaires near permanent pools</th>
<th>Key required parameters of 680.22(B) requirements for luminaires near permanent pools</th>
<th>Proposed 411.4(B) GFCI protected if &lt; 10 ft horiz. 12 ft or more vert. if &lt; 5 ft horiz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>680.22(B)(1) New Outdoor Installation Clearances</td>
<td>If luminaire above pool or ≤ 5 ft horiz., Req = 12 ft or more vert.</td>
<td>Does proposed 411.4(B) conflict with 680.22(B)(j)? Is proposed 411.4(B) less stringent than 680.22(B)(j)?</td>
</tr>
<tr>
<td>680.22(B)(2) Indoor Clearances</td>
<td>Same as outdoor, except a totally enclosed luminaire is permitted closer to pool than outdoor if GFCI protected and 7 ft 6 in. or more vert.</td>
<td>No</td>
</tr>
<tr>
<td>680.22(B)(3) Existing Installations (of luminaires)</td>
<td>If luminaire ≤ 5 ft horiz., Req = 5 ft or more vert., GFCI protected, and attached to structure</td>
<td>No</td>
</tr>
<tr>
<td>680.22(B)(4) GFCI Protection in Adjacent Areas</td>
<td>If luminaire 5 ft to 10 ft horiz., Req. = GFCI protected or (5 ft or more vert. and attached to structure)</td>
<td>No</td>
</tr>
<tr>
<td>680.22(B)(5) Cord-and-Plug-Connected Luminaires</td>
<td>If luminaire ≤ 18 ft radially, Req. = comply with 680.7. 680.7 Req. = Cord ≤ 3 ft, 12 gauge AWG grounding conductor, and grounding-type attachment plug</td>
<td>No</td>
</tr>
</tbody>
</table>
Proposed requirement 411.4(B) is at least as stringent as all of the multiple requirements in 680.22(B).

Existing 411.4(B) and Article 680, together, (a) permit luminaires as near as 1.5 m (5 ft) from permanent swimming pools, spas, hot tubs, and similar locations and (b) require luminaires to be no less than 3.0 m (10 ft) from storable pools, fountains, and similar locations. This difference in required minimum distance causes confusion and, as a result, inconsistent minimum installation distances being required in the field.

If the panel continues to find proposed 411.4(B) to be in conflict with, or less stringent than requirements of Article 680, submitter asks panel to:
A) Modify proposed 411.4(B) to remove the conflict or make more stringent as needed, and
B) Resolve the significant problem that prompted this proposal and revise 411.4(B) to permit installation distance for storable pools, fountains, and similar locations to be the same as required for permanent pools, spas, hot tubs, and similar locations. If the panel concludes the difference must remain, the submitter asks the panel to identify in a panel statement the safety-based rationale for requiring this difference.

Panel Meeting Action: Reject
Panel Statement: The panel reiterates that the requirements for luminaires adjacent to pools, fountains, spas, hot tubs and similar locations belong in Article 680. The submitter is directed to submit future proposals for changes concerning luminaires and pools to CMP 17 for their action. See action and statement on Comment 18-94.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-94 Log #304 NEC-P18 Final Action: Accept (411.4(B))

TCC Action: The Technical Correlating Committee directs that the text be revised to read as follows:

“(B) Pools, Spas, Fountains, and Similar Locations. Lighting systems shall not be installed less than 3 m (10 ft) horizontally from the nearest edge of the water unless permitted by Article 680.”

The Technical Correlating Committee revised the wording so that the text will comply with the NEC Style Manual.

Submitter: Code-Making Panel 17

Comment on Proposal No: 18-107
Recommendation: CMP-17 accepts the changes shown in the proposal for the title of 411.4 and section 411.4(A). CMP-17 has modified 411.4(B) to read as follows:

“(B) Pools, Spas, Fountains, and Similar Locations. Lighting systems shall be installed no closer than a minimum of 3 m (10 ft) horizontally from the nearest edge of the water. Unless permitted by Article 680.”

Substantiation: Actions of CMP-18. Furthermore, we believe that referring the user to Article 680 provides the user with a more detailed explanation of the requirements.

This comment has been balloted through CMP-17 with the following ballot results:
16 eligible to Vote
13 Affirmative
1 Negative
1 Abstention
1 NotReturned (B. Hanthorn)

Mr. T. Blewitt voted negatively stating: “The changes in headings are an improvement and are supported. The Panel’s proposed new text for 411.4(B) only restates the existing requirement in different sentence structure and is not supported. It does not clarify the requirement. In addition, the Panel comment (“...more detailed explanation of the requirements.”) is not supported. The submitter sought to clearly state the requirements in 411.4(B) so that they did not need to be explained. Such explanation becomes necessary due to the general reference to “Article 680,” a seeming noncompliance with 4.1.1 of the NEC Style Manual.”

Mr. R. Swiegart abstained from voting stating: “Since I am also a member of CMP-18, I do not want my vote to influence the collective vote of CMP-17.”

Mr. R. Yasenchak voted affirmatively stating: “We agree with the modifications set forth in this comment. The substantiation for this comment, however, is in conflict with the suggested action, by agreeing with the panel action on 18-107 and promoting no change. We believe that the substantiation should agree only with the intent of the panel action on Proposal 18-107, and endorse the suggested modification.”

Panel Meeting Action: Accept
Panel Statement: The panel notes that the requirement is a single sentence that reads: “(B) Pools, Spas, Fountains, and Similar Locations. Lighting systems shall be installed no closer than a minimum of 3 m (10 ft) horizontally from the nearest edge of the water unless permitted by Article 680.”

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-95 Log #2224 NEC-P18 Final Action: Reject (411.4(B))

Submitter: James Durkin, MBL Corporation

Comment on Proposal No: 18-107
Recommendation: As a manufacturer of Listed power supplies (transformers) for the low voltage landscape lighting industry we would like to make a suggestion to clarify the section of the NEC that deals with the spacing around pools, spas and fountains. To read as follows:

Low voltage power supplies (transformers) must be connected to a GFCI and be mounted no closer than 10 ft (3.05 m) of pools, spas, fountains or similar locations. Low voltage landscape fixtures should not be mounted closer than 5 ft (1.52 m) of pools, spas, fountains or similar locations and must be connected to a listed isolation type transformer.

Substantiation: We believe that this will help end some of the confusion and conflict and will add to the safe use of electrical equipment around pools.

Panel Meeting Action: Reject
Panel Statement: See the panel actions on Comments 18-93 and 18-94 and the panel statement on Comment 18-93.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

17-5 Log #1979 NEC-P17 Final Action: Reject (422.12, FPN (New))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 17-10
Recommendation: This Proposal should have been Accepted.

Substantiation: The proposed FPN was intended only to remind users that the exceptions do not alter the requirements of 210.23 which specify permissible loads. Contrary to the panel objection to the proposal being inadequate, a FPN could not say what is or is not permitted to be supplied - such prescriptive language must be in the code itself, as it is in 422.12. The second part of the panel statement that the FPN as proposed could be misleading to users is interesting in light of the completely inaccurate substantiation for this proposal for the 2005 NEC. That proposal and the panel’s acceptance of the proposal left many users (especially those who read the ROP and ROC for assistance in interpretation) to be misled that this new exception was actually likely to be usable or that the loads being non-coincident had anything to do with making the exception usable. Article 422 cannot modify Article 210 so the branch circuits covered by Article 422 must also comply with Article 210. Both Exceptions to 422.12 permit the circuit in question to be other than an individual branch circuit, but limit the other loads that may be supplied and, therefore, answer the question as to what may or may not be supplied.

Exception No. 1 is often useful because the other permitted loads are very small. Exception No. 2 is more difficult to use because the sum of the loads cannot exceed the branch circuit rating. In addition, many fixed central heating appliances have ratings that exceed 50 percent of the smallest permitted branch circuit and do not leave enough for permanently connected AC equipment. The proposed FPN is intended only to remind users that the requirements of 210.23 still apply.

Panel Meeting Action: Reject
Panel Statement: Branch circuits should be sized in accordance with the requirements of Articles 210, 220, 424, and 440. The addition of an FPN that just refers to 210.23 could mislead the user to believe that additional undefined loads could be added to the circuit dedicated to central heating.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gill, C.

ARTICLE 422 — APPLIANCES

17-6 Log #454 NEC-P17 Final Action: Reject (422.12 Exception No. 2)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-9
Recommendation: Accept proposal as modified:

Permanently Connected. Air conditioning equipment and central heating equipment shall be permitted to be connected to the same branch circuit where means are provided to prevent simultaneous operation.

Substantiation: There doesn’t seem to be a safety reason (or practical reason) why a cord-and-plug-connected room air conditioner should not be permitted. A circuit could supply an air conditioner receptacle and baseboard heating in the same room (baseboard heaters are not central heating). Means should be provided to prevent simultaneous outage. Older or infirm persons may suffer severe consequences if reliability is compromised. Simultaneous operation whether cord or permanently connected can be easily prevented with a selector switch.

Panel Meeting Action: Reject
Panel Statement: Cord- and plug-connected air conditioners require a receptacle that can accept other loads. Means to prevent simultaneous operation would compromise the assured power intended for central heating equipment.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gill, C.
I draw attention to a Power Point Presentation entitled “Fires Starting With...” for heaters are being investigated by UL as the Panel has been informed. The summary for appliances including room air heaters prior to and during the period under consideration. Improvements to power cord specification already adopted by manufacturers in 2002. It depicts an incident rate declining at a fairly uniform rate from 15,000 fires in May, 2005. Slide 14 is entitled “U.S. Cord or Plug Structure Fires, 1980 to 2002”. This trend will continue, particularly as further improvements to power cords, including other code rules, and their implementation by manufacturers have been achieved.

**Recommendation:**

Submitter: Joel Williams, Herriman, UT

**Comment on Proposal No:** 17-12

**Recommendation:** Accept proposed change.

**Proposal:**

Item 4 of my Explanation of Negative on the Panel Vote. This requirement does not correlate with the definition of Branch Circuit. This proposal for 2005 was to clarify if the 125% language was intended to imply that the branch circuit load was to be treated as a continuous load or not. Panel 17 accepted the proposal without apparent regard for the other unsubstantiated change that was made. The proposal and this comment are intended to repair that problem.

**Panel Meeting Action:** Accept

**Ballot Results:** Affirmative: 13

**Ballot Not Returned:** 1 Gill, C.

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17-8 Log #425 NEC-P17 (422.16(B)(4)(5))

**Final Action:** Reject

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 17-18

**Recommendation:** Accept proposal.

**Proposal:** Individual branch circuit is to provide for a possible equipment structure replacement although 90.1(A)(b) indicates the code relates to safety, not future expansion. There was no valid substantiation in Proposal 17-21 in the 2004 ROP for an individual circuit. An individual circuit is not required for a permanently connected (hard wired) range hood; these may also be replaced. This requirement does not correlate with the definition of Branch Circuit. Appliance, which permits more than one appliance on a circuit.

**Panel Meeting Action:** Reject

**Panel Statement:** The panel accepted the original substantiation for accepting 422.16(B)(4)(5) in the 2005 NEC. Section 90.1(B) is a warning to installers to let them know that meeting the minimum requirements of the NEC may not allow for future expansion of the installation; it is not a limitation on the Code for establishing minimum requirements for installations.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 13

**Ballot Not Returned:** 1 Gill, C.

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17-9 Log #1050 NEC-P17 (422.16(B)(5))

**Final Action:** Accept

**Submitter:** Richard J. Cripps, Association of Home Appliance Manufacturers

**Comment on Proposal No:** 17-13

**Recommendation:** Reject proposal.

**Proposal:** I am taking this opportunity to enlarge on an issue which I raised in Item 4 of my Explanation of Negative on the Panel Vote. I draw attention to a Power Point Presentation entitled “Fires Starting With Electrical Distribution Equipment” prepared for the NFPA by Dr. John Hall, Jr., in May, 2005. Slide 14 is entitled “U.S. Cord or Plug Structure Fires, 1980 to 2002.” It depicts an incident rate declining at a fairly uniform rate from 15,000 per year in 1980 to 4,300 in 2002. This substantial and sustained trend, I suggest, is the long term result of improvements to power cord specification already adopted by manufacturers for portable room air heaters prior to and during the period under review. The progressive decline reflects the aging and taking out of service and replacement of appliances manufactured prior to each successive specification enhancement; that is, the greater the proportion of appliances to post-enhancement specification in the overall population, the lower will be the number of incidents.

This trend will continue, particularly as further improvements to power cords for heaters are being investigated by UL as the Panel has been informed. The implementation of additional protective equipment at this time is, therefore, not justified in its final form as proposed by the original ballot at the NOP stage should be upheld.

**Note:** Supporting material is available for review at NFPA Headquarters.

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17-10 Log #1367 NEC-P17 (422.16(B)(5))

**Final Action:** Accept

**Submitter:** Wayne E. Morris, AHAM

**Comment on Proposal No:** 17-13

**Recommendation:** The Code Panel should Reject the original Proposal 17-13.

**Substantiation:** The CMP 17 should reject the original proposal 17-13 for the following reasons:

1. The original proposal used as substantiation newspaper clippings of supposed fires on portable electric room heaters. The information is based on inadequate support and poor information AHAM hired one of the preeminent safety statistics firms to report on the number of accidents that might be caused by power supply cords of heaters. The maker of the code proposal states...
The National Electrical Code panel responsible for circuit breakers has observed that item 5 of the submitter's substantiation does not address existing dwellings. Refer to panel action and statement for Comment 17-9.

Panel Meeting Action: Accept
Panel Statement: The panel accepts that documentation does exist of issues relating to power supply cords with portable electric heaters. The panel observes that item 5 of the submitter's substantiation does not address existing dwellings. Refer to panel action and statement for Comment 17-9.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.

Conclusion on Proposal No: 17-13
Support the code making panel’s recommendation to Reject the original Proposal. The NEC is not the proper place for portable product requirements. While this may be within the jurisdiction of the NEC and there is precedent for doing so, it is better to include end product requirements in the applicable product safety standards. End product requirements in the NEC are generally unenforceable by AHJs. The statistics cited by the proposer may not reflect safety improvements required by current editions of the product safety standards. Addition of an AFCI or LCDI will reduce the overall reliability of the product and may lead to consumers cutting the LCDI or AFCI off of the cord or making unsafe cord modifications or repairs. A UL task group has been looking into cord failures and may come up with better alternatives to deal with the root cause rather than the electronic band-aids that attempt to detect and respond to particular failures.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-9. The panel does not agree with the submitter’s substantiation.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.

Conclusion on Proposal No: 17-29
The code panel should reject Proposals 17-29 and 17-13.
Report on Comments A2007 — Copyright, NFPA

Substantiation: An AFCI and LCDI cannot detect a problem upstream of the protective device. Protection at the panel box will detect problems throughout the circuit including any issues with any appliances. Regulation should be focused at upgrading all home panel boxes to obtain the greatest benefit at the least expense.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comments 17-9 and 17-17. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative:
ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050) and Comment 17-17 (Log #1051).
Comment on Affirmative:
HIRSCH, B.: See my Comment under Comment 17-9.

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17-21 Log #1160 NEC-P17 Final Action: Accept
(422.16(B)(5), 422.52 (New ) )

Submitter: John N. Balough, The Hoover Company
Comment on Proposal No: 17-13
Recommendation: The code panel should reject Proposals 17-13 and 17-29.
Substantiation: The dependability of the LCDIs and AFCIs has not been proven and may lead to increased user involvement with the function of the equipment.

Changes to cord construction and design should be investigated before adding an additional component to the product cord, which the consumer could and most likely will remove if it becomes intermittent.

It is my belief there are better alternatives to improve product safety.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comments 17-9 and 17-17.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative:
ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050) and Comment 17-17 (Log #1051).
Comment on Affirmative:
HIRSCH, B.: See my Comment under Comment 17-9.

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17-22 Log #1166 NEC-P17 Final Action: Accept
(422.16(B)(5), 422.52 (New ) )

Submitter: Ramona Saar, AHAM
Comment on Proposal No: 17-13
Substantiation: The statistics upon which the proposals are (1) based are anecdotal in nature, not on research, and (2) do not take into account improvements made to the UL safety standards for fans and heaters. The devices (AFCI/LCDI) have not been proven to be reliable and the addition of these devices will (1) add additional possible sources of failure to the appliances and (2) lead to possible consumer tampering with devices - creating unsafe conditions.

UL’s Task Group on power cord safety advocates strengthening the safety tests for power cords - not mandating AFCIs and LCDIs. The recommendations of the technical experts that make up the UL Task Group should take precedence.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comments 17-9 and 17-17.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative:
ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050) and Comment 17-17 (Log #1051).
Comment on Affirmative:
HIRSCH, B.: See my Comment under Comment 17-9.

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17-25 Log #1292 NEC-P17 Final Action: Accept
(422.16(B)(5), 422.52 (New ) )

Submitter: Stephen T. Pastor, The Kirby Company
Comment on Proposal No: 17-13
Recommendation: The code panel should reject Proposals 17-13 and 17-29.
Substantiation: An AFCI and LCDI cannot detect a problem upstream of the protective device. Protection at the panel box will detect problems throughout the circuit including any issues with any appliances. Regulation should be focused at upgrading all home panel boxes to obtain the greatest benefit at the least expense.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comments 17-9 and 17-17.
The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative:
ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050) and Comment 17-17 (Log #1051).
Comment on Affirmative:
HIRSCH, B.: See my Comment under Comment 17-9.

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17-26 Log #1353 NEC-P17 Final Action: Accept
(422.16(B)(5))

Submitter: John N. Balough, The Hoover Company
Comment on Proposal No: 17-13
Substantiation: The submitter’s intent is to prohibit the use of the messenger free of ever being a current carrying conductor. Sections 250.32(B)(1) and 250.32(B)(2) in the 2005 NEC clearly set forth the rules for when this conductor can be a grounding conductor and when it can be a grounded conductor. Acceptance of this proposal would negate these applicable requirements when this wiring method is used. Article 396 should be used to determine the use, installation, and construction specifications for messenger supported wiring. Article 250 should be used to determine the grounding requirements. No evidence is offered that any of the incidents cited by the submitter is, or has been corrected by the application of insulated neutrals. No evidence is offered that using the messenger as a current carrying conductor is a hazard.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-9. The substantiation does not reflect the proposal for the code change. It is clearly based on some other proposal and not on Proposal 17-13.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative:
ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).
Comment on Affirmative:
HIRSCH, B.: See my Comment under Comment 17-9.
The protection shield of the LCDIs makes the power cord very stiff, their current design will not completely be resolved. Consumers/users are cutting the devices off due to nuisance tripping problems. The reliability of an AFCI or LCDI is less than a traditional plug and could lead to premature failures and to consumers making ill-advised or inappropriate repairs.

According to NFPA, receptacle, extension cord, power outlet strip, and house wiring electrical fires far outweigh any of the statistics from proven power supply cord issues. This would be a more impactful area of focus, rather than on the products which may be plugged into such devices.

Underwriters Laboratories has had a Task Group dedicated to investigating power supply cord issues and will be producing its second report shortly. This report is expected to make recommendations for changes to address the root cause of the issue, not add a component onto the product. This is a better way to address the issue and a better way to enforce the changes. The recommendation expands beyond appliances, suggests that extension cords should be enhanced to the same tough standards as portable appliances. The Code Panel should reject Proposal 17-13.

The NEC is not the most appropriate vehicle for mandating the requirements for consumer portable products. While this may be within the jurisdiction of the NEC, it would be better to use the applicable safety standards, which can be better enforced on products, let UL make the appropriate recommendations with support from the appliance industry, consumer groups, and the CPSC. UL has better knowledge of the appliance applications.

● The Code Panel action in January 2006 confused the issue, is inappropriate, and would cause interpretation problems for test agencies and authorities having jurisdiction (AHJs - i.e., electrical inspectors). [Note the panel action and statement on Proposal 17-9.]

17-31 Log #1430 NEC-P17 (422.16(B)(5), 422.52 (New))

Final Action: Accept

Submitter: Walter G. Birdsell, Kaz, Incorporated

Comment on Proposal No: 17-13


Substantiation: ● The NEC is not the most appropriate vehicle for mandating requirements to consumer portable products. While this may be within the jurisdiction of the NEC, it would be better to use the applicable safety standards, which can be better enforced on products, let UL make the appropriate recommendations with support from the appliance industry, consumer groups, and the CPSC. UL has better knowledge of the appliance usages in the field.

● The Code Panel action in January 2006 confused the issue, is inappropriate, and would cause interpretation problems for test agencies and authorities having jurisdiction (AHJs - i.e., electrical inspectors). [Note the panel action was to include the words, “422.52 single phase cord-and plug-connected electric fans shall be provided with factory-installed LCDI, AFCI, or other listed protection equal to or exceeding that of an LCDI or AFCI. The protection shall be of the attachment plug or receptacle located in the power supply cord within 100 mm (12 in.) of the attachment plug.”] The members noted that the addition of this language would make this section impossible to administer. The statement is open ended, thus needs to be better defined, this statement interjects the mandate of any technology that can be marketed, but not properly evaluated.

● UL has had, for the past 2 years, a Task Group dedicated to investigating power supply cord issues and will be unveiling its second report in a few weeks. This report will make recommendations for changes to address the root cause of the issue, not add a component onto the product. This is a better way to address the issue and a better way to enforce the changes. The recommendation expands beyond appliances, suggests that extension cords should be enhanced to the same tough standards as portable appliances. Extension cords per the NFPA Fire Stats 0505 report by Dr. John R. Hall, Jr., are indicated as a greater cause of fires than end appliances.

● There have been many problems identified in applying AFCIs and/or LCDIs to room air conditioners. These are only slowly coming to light and have not completely been resolved. Consumers/users are cutting the devices off cords or returning the products due to false tripping or nuisance activation. When these devices were added, the fault tree compound due to the complexity of going from a standard power plug to an electronic device that has a complex circuit that can fail due to power surges, or mishandling of the power cord. The devices are heavy, loose wall outlets compound the failure due to nuisance tripping problems. The reliability of an AFCI or LCDI is less than a traditional plug and could lead to premature failures and to consumers making ill-advised or inappropriate repairs.

17-32 Log #1730 NEC-P17 (422.16(B)(5) (New))

Final Action: Accept

Submitter: J.B. Hoyt, Whirlpool Corporation

Comment on Proposal No: 17-13


Substantiation: ● As a major manufacturer of Room Air Conditioners, Whirlpool Corporation has firsthand experience with the real world application of AFCI’s and LCDI’s. There have been many problems identified in applying these devices to room air conditioners.

● The dependability/reliability of the AFCIs and LCDIs have not been conclusively proven.

● Consumers/users are cutting the devices off cords or returning the products due to nuisance tripping problems.

● Nuisance tripping has also led to increased consumer complaints and service calls.

● The reliability of an AFCI or LCDI is less than a traditional plug and could lead to premature failures and to consumers making ill-advised or inappropriate repairs.

According to NFPA, receptacle, extension cord, power outlet strip, and house wiring electrical fires far outweigh any of the statistics from proven power supply cord issues. This would be a more impactful area of focus, rather than on the products which may be plugged into such devices.

Underwriters Laboratories has had a Task Group dedicated to investigating power supply cord issues and will be producing its second report shortly. This report is expected to make recommendations for changes to address the root cause of the issue, not add a component onto the product. This is a better way to address the issue and a better way to enforce the changes.
 Limit testing with AFCIs has shown that in many cases, the device will not open the circuit when encountering an arcing condition in the product. In addition, most AFCIs will not open circuit when encountering a series arc failure. LCDIs must have a fault only in the power cord. They do not work on arcs in the product.

Neither, the AFCI nor the LCDI can detect problems upstream in an extension cord or in the receptacle, which, according to NFPA data is a much bigger problem that, therefore, would not be addressed.

AFCI's and LCDI's are not the same and should not be looked upon as a solution to the issues that have been raised. There are many other ways to improve the safety other than adding an unproven component to the product.

AFCI and LCDI devices are electronic devices with a complexity that exhibits the potential of typical electronics failures such as arc track and component overheating or burnout etc. In comparison, these failure modes do not exist with power plug. Bad material choices and manufacturing issues have been observed. The question whether the increased risk and number of failures outweighs the alleged number of failures has not been answered satisfactorily. Meaning, are these devices really a safety improvement, especially considering reports of cut of devices, etc., in order to avoid nuisance tripping.

### Panel Meeting Action: Accept

Panel Statement: Also refer to the panel action and statement on Comment 17-9.

The panel does not agree with the submitter’s substantiation.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

### Explanation of Negative:

ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).

### Comment on Affirmative:

HIRSCH, B.: See my Comment under Comment 17-9.

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17-35 Log #1921 NEC-P17  
(422.16(B)(5))

Final Action: Accept

### Submitter:

Ralph Hudnall, Euro-Pro

### Comment on Proposal No:

17-13

### Recommendation:


### Substantiation:

The proposed devices are not designed to provide the level of protection required of the consumer. They do not accurately sense the problems that cause fires in consumer products. More research is needed to devise a best practice in this case.

### Panel Meeting Action: Accept

Panel Statement: Also refer to the panel action and statement on Comment 17-9.

The panel does not agree with the submitter’s substantiation.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

### Explanation of Negative:

ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).

### Comment on Affirmative:

HIRSCH, B.: See my Comment under Comment 17-9.

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17-37 Log #1927 NEC-P17  
(422.16(B)(5))

Final Action: Accept

### Submitter:

David Lindahl, Opelitea, AL

### Comment on Proposal No:

17-13

### Recommendation:

The panel should reject the indicated Proposal.

### Substantiation:

The problem should be addressed by making manufacturing of upstream AFCIs and LCDIs fix these products for reliability. With this proposal all that is being done is bandaiding the problem not correcting it.

### Panel Meeting Action: Accept

Panel Statement: Also refer to the panel action and statement on Comment 17-9.

The panel does not agree with the submitter’s substantiation.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

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17-41 Log #1937 NEC-P17  
(422.16(B)(5), 422.52 (New) )

Final Action: Accept

### Submitter:

Laura Hudnall, Opelitea, AL

### Comment on Proposal No:

17-13

### Recommendation:


### Substantiation:

AFCIs and LCDIs are not the same and should not be looked upon as a solution to the issues that have been raised. There are many other ways to improve the safety other than adding an unproven component to the product.

### Panel Meeting Action: Accept

Panel Statement: Also refer to the panel action and statement on Comment 17-9.

The panel does not agree with the submitter’s substantiation.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

### Explanation of Negative:

ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).

### Comment on Affirmative:

HIRSCH, B.: See my Comment under Comment 17-9.

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17-44 Log #2112 NEC-P17  
(422.16(B)(5) (New )

Final Action: Accept

### Submitter:

Mathew Hudnall, Opelitea, AL

### Comment on Proposal No:

17-13

### Recommendation:

The code panel should Reject Proposal 17-13.

### Substantiation:

There are other ways to improve safety other than adding an unproven component to the product.

### Panel Meeting Action: Accept

Panel Statement: Also refer to the panel action and statement on Comment 17-9.

The panel does not agree with the submitter’s substantiation.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

### Explanation of Negative:

ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).

### Comment on Affirmative:

HIRSCH, B.: See my Comment under Comment 17-9.
The substantiation is also incorrect in stating that a receptacle “cannot be HIRSCH, B.: The proposer makes the point that this is impossible to enforce. integrates product standards, installation standards, product testing and The Edison Electric Institute supports the entire electrical safety system that the National Electrical Code’s intent or scope to set requirements for end- wiring system are best covered by appropriate product standards. It is not electrical devices that would typically be purchased by the after market use electrical devices that are 

Proposal 17-19. No substantiation has been provided for new Item (7). comment on Proposal No: 17-19

Panel Meeting Action: Accept

Panel Statement: The panel reaffirms its original substantiation for rejecting Proposal 17-19. No substantiation has been provided for new Item (7).

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Gill, C.

17-13 Log #1983 NEC-P17 Final Action: Accept (422.33(A))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 17-23

Recommendation: This Proposal should have been Rejected.

Substantiation: The proposal said it was only editorial in nature (“Edit”), but it actually results in a significant and onerous change. This rule will require the receptacle for a refrigerator to be located in a space other than behind the refrigerator. Since a refrigerator in most existing installations and in common practice usually has to be pulled out a bit to access its receptacle outlet, the outlet is not readily accessible and another disconnect would be required. Similarly, a receptacle for a dishwasher or range that is accessible by pulling the appliance out from the wall would no longer qualify as a disconnect for that appliance. No substantiation was provided for these drastic changes in the requiremments for appliance disconnects.

The substantiation is also incorrect in stating that a receptacle “cannot be ‘not accessible’ (closed in by building finish)...”. This statement is based on the definition of accessible as applied to wiring methods. Receptacles are not “wiring methods” and are not covered by Chapter 3, they are a type of “Equipment for General Use” covered by Chapter 4. The definition of accessible that should be applied to receptacles is Accessible (as applied to equipment): “Admitting close approach; not guarded by locked doors, elevation, or other effective means.”

Panel Meeting Action: Accept

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Gill, C.

17-14 Log #407 NEC-P17 Final Action: Reject (422.45)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-25

Recommendation: Accept

Substantiation: This requirement is virtually impossible to enforce. It puts an obligation on the builder or electrical contractor which has never, to my knowledge, been enforced. At time of final inspection there may be no occupant; are follow-up inspections intended to enforce compliance? Such a requirement is more appropriate in manufacturer literature or instructions. How can it be ascertained if a portable smoothing iron is ever to be provided.

Panel Meeting Action: Reject

Panel Statement: The submitter has not provided any new substantiation to delete the text.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

Explanation of Negative: HIRSCH, B.: The proposer makes the point that this is impossible to enforce. The EEI/ELEP Companies agrees with this comment. The EEI also believes this is an appliance requirement and as such does not belong in the Code. It is the Edison Electric Institute’s position that the requirements for end-use electrical devices that are not installed as part of the permanent premises wiring system of a building covered by appropriate product standards. It is not the National Electrical Code’s intent or scope to set requirements for end-use electrical devices that would typically be purchased by the after market consumer.

The Edison Electric Institute supports the entire electrical safety system that integrates product standards, installation standards, product testing and evaluation, electrical inspection, manufacturer’s products, qualified electrical installation and maintenance, electric supply system characteristics, and the owner’s use and operation. Covering product standards in the National Electrical Code could negate the responsibility of the appropriate product standard and adversely impact the entire process.

The integrity of the electrical safety system is anchored in the systematic integration of the National Electrical Code, installation inspection, product safety standards and product testing. If non-premises end-use product safety issues are usurped by the National Electrical Code, the product safety standard process will be weakened resulting in the entire process being weakened. In addition, since non-premises end-use products are not normally in place during the inspection process, enforcement of such a requirement under the NEC would be impossible.

17-15 Log #463 NEC-P17 Final Action: Accept in Principle (422.52 (New))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-28

Recommendation: Accept proposal revised:
Electric drinking fountains shall be provided with ground-fault circuit-interrupter protection.

Substantiation: The submitter has proposed a good safety requirement.

Panel Meeting Action: Accept in Principle

Add new 422.52 to read as follows:
422.52 Electric Drinking Fountains. Electric drinking fountains shall be protected with ground-fault circuit-interrupter protection.

Panel Statement: The panel accepts the submitter’s recommendation but has added a title and used the word “protected” rather than “provided” for clarity. It has been brought to the attention of the panel that there have been documented fatalities that have been attributed to this kind of installation.

This requirement is not intended to apply to bottled water coolers.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Gill, C.

Comment on Affirmative:
BLEWITT, T.: A single incident was described to the panel though two were reported to have occurred. The described incident involved a water fountain where the factory-supplied grounding pin of the attachment plug cap was removed.

17-16 Log #1029 NEC-P17 Final Action: Accept (422.52 (New))

Submitter: Larry Johnson, National Presto Industries Inc.

Comment on Proposal No: 17-29

Substantiation: UL has had, for the past 2 years, a task group (I am a member of the group) dedicated to investigating power supply cord issues and will be unveiling its second report in a few weeks. This report will make recommendations for changes to address the root cause of the issue, not add a component onto the product. This is a better way to address the issue and a better way to enforce the changes.

Panel Meeting Action: Accept

Panel Statement: Also refer to panel action and statement on Comment 17-17.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:
ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).

Comment on Affirmative:
HIRSCH, B.: See my Comment under Comment 17-9.

17-17 Log #1051 NEC-P17 Final Action: Accept (422.52 (New))

Submitter: Richard J. Cripps, Association of Home Appliance Manufacturers

Comment on Proposal No: 17-29

Recommendation: Reject proposal.

Substantiation: I am taking this opportunity to enlarge on an issue which I raised in Item 4 of my Explanation of Negative on the Panel Vote.

I draw attention to a Power Point Presentation entitled “Fires Starting With Electrical Distribution Equipment” prepared for the NFPA by Dr. John Hall, Jr., in May, 2005. Slide 14 is entitled “U.S. Cord or Plug Structure Fires, 1980 to 2002.” It depicts an incident rate declining at a fairly uniform rate from 15,000 per year in 1980 to 4,300 in 2002.

This substantial and sustained trend, I suggest, is the long term result of improvements to power cord specification progressively adopted by manufacturers for appliances generally prior to and during the period reviewed. The decline which has been maintained reflects the aging, taking out of
These key issues were omitted from the comment's substantiation by HIRSCH, B.: See my Comment under Comment 17-9.

HIRSCH, B.: See my Comment under Comment 17-9

● Problems do not affect deaths or loss as much.

ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).

ROCK, B.: NEMA affirms its support for AFCI and LCDI technology to prevent cord fires. The significant amount of cord fires attributed to portable electric fans, combined with high probability of these products being operated and unattended, further attests to the need for these technologies to reduce cord fires.

The comment rationale relies heavily on a recent NFPA study that utilizes a new reporting system over the previous reports and is suspect as to whether the reduction in fires is a result of product improvements or flaws by the change in the reporting system. We base this on the statements made by the author of this study, Dr. John Hall, as cited below:

● Estimates of fire incidents and nonfatal injuries after 1998 are not yet reliable.
● Rapid, deep declines that seem to relate to unresolved analysis problems rather than reality.
● We’re still working on this.
● Problems do not affect deaths or loss as much.

These key issues were omitted from the comment’s substantiation by extracting only a page from the entire report. Of particular note, the number of reported deaths is not declining as rapidly as the reported fire data. Fires are resulting from damaged cords and can be prevented by incorporating the safety devices recommended in Comment 17-46 (Log #2234) by a proven technology as evaluated by UL for this very purpose.

Comment on Affirmative:

BLEYWITZ, T.: Revisions have been submitted for comment to the Standards Technical Panel (STP507) responsible for the product safety standard (UL 507, Electric Fans). Comments from the STP are due by January 19, 2007 after which the proposed revisions will be balloted for adoption.

HIRSCH, B.: See my Comment under Comment 17-9.

Panel Meeting Action: Accept

Panel Statement: Currently, UL is in the process of revising the product safety standard (UL 507, Electric Fans) to upgrade the power supply cords in lieu of adding protective devices. The revisions are expected to be adopted in 2007.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

ROCK, B.: NEMA affirms its support for AFCI and LCDI technology to prevent cord fires. The significant amount of cord fires attributed to portable electric fans, combined with high probability of these products being operated and unattended, further attests to the need for these technologies to reduce cord fires.

The comment rationale relies heavily on a recent NFPA study that utilizes a new reporting system over the previous reports and is suspect as to whether the reduction in fires is a result of product improvements or flaws by the change in the reporting system. We base this on the statements made by the author of this study, Dr. John Hall, as cited below:

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● Rapid, deep declines that seem to relate to unresolved analysis problems rather than reality.
● We’re still working on this.
● Problems do not affect deaths or loss as much.

These key issues were omitted from the comment’s substantiation by extracting only a page from the entire report. Of particular note, the number of reported deaths is not declining as rapidly as the reported fire data. Fires are resulting from damaged cords and can be prevented by incorporating the safety devices recommended in Comment 17-46 (Log #2234) by a proven technology as evaluated by UL for this very purpose.

Comment on Affirmative:

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HIRSCH, B.: See my Comment under Comment 17-9.

Panel Meeting Action: Accept

Panel Statement: Currently, UL is in the process of revising the product safety standard (UL 507, Electric Fans) to upgrade the power supply cords in lieu of adding protective devices. The revisions are expected to be adopted in 2007.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

ROCK, B.: NEMA affirms its support for AFCI and LCDI technology to prevent cord fires. The significant amount of cord fires attributed to portable electric fans, combined with high probability of these products being operated and unattended, further attests to the need for these technologies to reduce cord fires.

The comment rationale relies heavily on a recent NFPA study that utilizes a new reporting system over the previous reports and is suspect as to whether the reduction in fires is a result of product improvements or flaws by the change in the reporting system. We base this on the statements made by the author of this study, Dr. John Hall, as cited below:

● Estimates of fire incidents and nonfatal injuries after 1998 are not yet reliable.
● Rapid, deep declines that seem to relate to unresolved analysis problems rather than reality.
● We’re still working on this.
● Problems do not affect deaths or loss as much.

These key issues were omitted from the comment’s substantiation by extracting only a page from the entire report. Of particular note, the number of reported deaths is not declining as rapidly as the reported fire data. Fires are resulting from damaged cords and can be prevented by incorporating the safety devices recommended in Comment 17-46 (Log #2234) by a proven technology as evaluated by UL for this very purpose.

Comment on Affirmative:

BLEYWITZ, T.: Revisions have been submitted for comment to the Standards Technical Panel (STP507) responsible for the product safety standard (UL 507, Electric Fans). Comments from the STP are due by January 19, 2007 after which the proposed revisions will be balloted for adoption.

HIRSCH, B.: See my Comment under Comment 17-9.

Panel Meeting Action: Accept

Panel Statement: Currently, UL is in the process of revising the product safety standard (UL 507, Electric Fans) to upgrade the power supply cords in lieu of adding protective devices. The revisions are expected to be adopted in 2007.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

ROCK, B.: NEMA affirms its support for AFCI and LCDI technology to prevent cord fires. The significant amount of cord fires attributed to portable electric fans, combined with high probability of these products being operated and unattended, further attests to the need for these technologies to reduce cord fires.

The comment rationale relies heavily on a recent NFPA study that utilizes a new reporting system over the previous reports and is suspect as to whether the reduction in fires is a result of product improvements or flaws by the change in the reporting system. We base this on the statements made by the author of this study, Dr. John Hall, as cited below:

● Estimates of fire incidents and nonfatal injuries after 1998 are not yet reliable.
● Rapid, deep declines that seem to relate to unresolved analysis problems rather than reality.
● We’re still working on this.
● Problems do not affect deaths or loss as much.

These key issues were omitted from the comment’s substantiation by extracting only a page from the entire report. Of particular note, the number of reported deaths is not declining as rapidly as the reported fire data. Fires are resulting from damaged cords and can be prevented by incorporating the safety devices recommended in Comment 17-46 (Log #2234) by a proven technology as evaluated by UL for this very purpose.

Comment on Affirmative:

BLEYWITZ, T.: Revisions have been submitted for comment to the Standards Technical Panel (STP507) responsible for the product safety standard (UL 507, Electric Fans). Comments from the STP are due by January 19, 2007 after which the proposed revisions will be balloted for adoption.

HIRSCH, B.: See my Comment under Comment 17-9.

Panel Meeting Action: Accept

Panel Statement: Currently, UL is in the process of revising the product safety standard (UL 507, Electric Fans) to upgrade the power supply cords in lieu of adding protective devices. The revisions are expected to be adopted in 2007.
the issues that have been raised by the Code Making Panel. The direction of the
STP is to address the actual root causes of the problem, not add an unproven
and inadequate component. The UL STP is presenting a detailed report within a
few weeks to request comment on proposals to address this situation. This will
result in changes to address this issue in a much more rapid and thorough
manner than the NEC proposal.
4. Testing with LCDIs and AFCIs have shown that the two devices are not
equivalent and do not provide equal electrical safety protection. They should
have never been included in a proposal as implying they provide similar
electrical protection. Power cord AFCIs have been shown to have little or no
effect on series arcs. There are even questions whether they will prevent
problems in parallel areas. LCDI’s have no effects on arcs inside the product.
Neither power cord AFCIs nor LCDIs have any effect on arcing in receptacles or
extension cords. AFCI breakers on all household circuits is a much more effective way of reducing home fires.
5. The National Electrical Code panel responsible for circuit breakers has
advanced a proposal in the 2008 NEC to require AFCI breakers on all
household circuits. This will protect all the house circuits on new construction
from the panel box through the receptacle. As has been shown most of the
home electrical fires are not due to portable electric fans but rather to home
wiring, receptacles or even extension cords. AFCI breakers on all household
circuits is a much more effective way of reducing home fires.
6. The UL STP has made several changes to improve safety of electric fans
by increasing requirements for oscillating fan cords. This will improve safety and
address one of the main sources of issues presented in CPSC incident
reports.
7. The UL Working Group, representing many stakeholders including a
manufacturer of cord mounted AFCIs and LCDIs has suggested an alternate
course of action. This course of action should be given preference and allowed
to further the safety of these products through the changes to the UL standards.
Panel Meeting Action: Accept
Panel Statement: The panel accepts that documentation does exist of issues
relating to power supply cords with portable electric fans. The panel observes
that item 5 of the submitter’s substantiation does not address existing
dwellings. Refer panel action and statement on Comment 17-17.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative: ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).
Comment on Affirmative: HIRSCH, B.: See my Comment under Comment 17-9.

17-33 Log #1719 NEC-P17 Final Action: Accept
(422.52 (New))

Submitter: J.B. Hoyt, Whirlpool Corporation
Comment on Proposal No: 17-29
Substantiation: As a major manufacturer of Room Air Conditioners,
Whirlpool Corporation has firsthand experience with the real world application
of AFCIs and LCDIs. There have been many problems identified in applying
these devices to room air conditioners.
● The dependability/reliability of the AFCIs and LCDIs have not been conclusively proven.
● Consumers/users are cutting the devices off cords or returning the products
due to nuisance tripping problems.
● Nuisance tripping has also led to increased consumer complaints and service calls.
● The reliability of an AFCI or LCDI is less than a traditional plug and could
lead to premature failures and to consumers making ill-advised or inappropriate
repairs.
● According to NFPA, receptacle, extension cord, power outlet strip, and	household electrical fires top the list of all of the statistics from proven
power supply cord issues. This would be a more impactful area of focus, rather than
on the products which may be plugged into such devices.
● Underwriters Laboratories has had a Task Group dedicated to investigating
power supply cord issues and will be producing its second report shortly. This report
is expected to make recommendations for changes to address the root
cause of the issue, not add a component onto the product. This is a better way
to address the issue and a better way to enforce the changes.
● The NEC often drives requirements that are included in product safety
standards of UL or CSA, but without the benefit of manufacturing experience
from a broad range of interested parties. Additionally, the enforcement of the
NEC may not be as complete as it would be by following the UL or CSA
standards making and certification process. The use of this process should be
liberally applied.
● Limited testing with AFCI’s has shown that in many cases, the device will
not open the circuit when encountering an arcing condition in the product. In
addition, most AFCI’s will not open circuit when encountering a series are
failure. LCDI’s must have a fault only in the power cord. They do not work on
arcs that exist within the product.
● Neither, the AFCI nor the LCDI can detect problems upstream in an
extension cord or in the receptacle, which, according to NFPA data is a much
bigger problem that, therefore, would not be addressed.
● AFCI’s and LCDI’s are not the same and should be looked upon as a
solution to the issues that LCDI and AFCI devices are not installed as part of the permanent premises should be covered by the
appropriate product standard.
satisfactorily. Meaning, are these devices really a safety improvement, especially considering reports of cut of devices, etc., in order to avoid nuisance tripping.

Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-17. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative: ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).
Comment on Affirmative: HIRSCH, B.: See my Comment under Comment 17-9.

17-36 Log #1924 NEC-P17 Final Action: Accept (422.52 (New ))
Submitter: Ralph Hudnall, Euro-Pro
Comment on Proposal No: 17-29
Substantiation: The problem should be addressed by making manufacturing of upstream AFCIs and LCDIs fix these products for reliability. With this proposal all that is being done is bandaiding the problem not correcting it.
Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-17. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative: ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).
Comment on Affirmative: HIRSCH, B.: See my Comment under Comment 17-9.

17-39 Log #1935 NEC-P17 Final Action: Accept (422.52 (New ))
Submitter: Patricia Gilmore, Auburn, AL
Comment on Proposal No: 17-29
Substantiation: The dependability of the LCDIs and AFCIs have not been conclusively proven.
Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-17. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative: ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).
Comment on Affirmative: HIRSCH, B.: See my Comment under Comment 17-9.

17-42 Log #1938 NEC-P17 Final Action: Accept (422.52 (New ))
Submitter: Laura Hudnall, Opelika, AL
Comment on Proposal No: 17-29
Substantiation: The dependability of the LCDIs and AFCIs have not been conclusively proven.
Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-17. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative: ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).
Comment on Affirmative: HIRSCH, B.: See my Comment under Comment 17-9.

17-43 Log #2111 NEC-P17 Final Action: Accept (422.52 (New ))
Submitter: Mathew Hudnall, Opelika, AL
Comment on Proposal No: 17-29
Recommendation: Proposal 17-29 should be Rejected by the code panel.
Substantiation: There are other ways to improve safety other than adding an unproven component to the product.
Panel Meeting Action: Accept
Panel Statement: Also refer to the panel action and statement on Comment 17-17. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative: ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).
Comment on Affirmative: HIRSCH, B.: See my Comment under Comment 17-9.

17-45 Log #2190 NEC-P17 Final Action: Reject (422.52 (New ))
Submitter: Gary Beideman, Lasko Products, Inc.
Comment on Proposal No: 17-29
Recommendation: Revise text to read as follows:
422.52 Cord-and-Plug-Connected Electric Fans. Single-Phase cord-and-plug connected electric fans shall be provided with a listed factory-installed Over Current Protective Device, LCDI or AFCI, or other listed protection equal to or exceeding that of an LCDI or AFCI. The protection shall be an integral part of the attachment plug or be located in the power supply cord between 152 mm (6 in.) and 300 mm (12 in.) of the attachment plug.
Substantiation: AFCIs and LCDIs are both current limiting devices. They function differently and have limitations as to the type of failures they rectify to. The goal I see, no matter how robust the cord, is to limit the current, i.e., available energy when a failure occurs. The code line (or other listed protection equal to or exceeding that of an LCDI or AFCI) is misleading and will be open to interpretations where no other device can be considered, because AFCIs and LCDIs operate on different principles. Alternate devices can meet the current (energy) limiting goal and in many ways exceed the performance of AFCIs and LCDIs. The addition of the wording “LISTED” and “OVERCURRENT PROTECTION DEVICE” will allow for new and presently existing technology to be considered and not limit choices to only two devices. I have submitted a study performed by ARAI (Accident Reconstruction Analysis) which details the benefit of existing fuse technology by limiting available energy to ignite surrounding combustibles.) (Earl W. Roberts is a former presenter to the NEC Code Panel 17 Working Group. In his published book, “Under Currents and Over Currents”. On pages 6 and 7 of this book, he details the simplicity, long reliable history and indigenous ability of a fuse to quickly clear and current-limit a fault condition.)
The (300 mm, 12 in.) length of cord stated from the plug to the device is not constant with existing UL codes for other devices. The 12 in. length will expose excessive cord that is unprotected. The amount of unprotected cord should be kept to a minimum. Changing the length to (152 mm, 6 in.) is consistent with experience gained in other UL standards, i.e., the standard for Christmas Tree lighting (UL Standard 588, paragraph 7.3). Lasko Products Inc. has 13,000,000 fan products in the field which utilized a Listed Design, Molded Fuse in the plug and have received no reports of cord set fires associated with these products.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: Proposal 17-29 has been rejected by the action on Comment 17-17 and this comment is therefore not applicable. The panel does not agree with the submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.

Recommendation:

ROCK, B.: See reason for NEMA vote on Comment 17-17 (Log #1051).

Comment on Ballot Action:

HIRSCH, B.: See my Comment under Comment 17-9.

ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).

Final Action: Reject

17-46 Log #2234 NEC-P17

(422.53 (New))


Comment on Proposal No: 17-29

Explanation of Negative:

ROCK, B.: NEMA continues to support the protection of cords through the use of technology that has a proven history. The proposed solution (of AFCI or LCDI technology) by the commenter would address fires resulting from damaged appliance cords as determined by the UL standard to evaluate this technology (UL 1699). Due to the facts that noted data sources indicate that fires are occurring due to damaged cords supplying portable fans, there is no reason not to require a known technology that will eliminate or prevent this hazard.

Comment on Affirmative:

Comment on Proposal No: 17-46

Explanation of Negative:

HIRSCH, B.: See my Comment under Comment 17-9.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.

Recommendation:

ROCK, B.: NEMA continues to support the protection of cords through the use of technology that has a proven history. The proposed solution (of AFCI or LCDI technology) by the commenter would address fires resulting from damaged appliance cords as determined by the UL standard to evaluate this technology (UL 1699). Due to the facts that noted data sources indicate that fires are occurring due to damaged cords supplying portable fans, there is no reason not to require a known technology that will eliminate or prevent this hazard.

Comment on Ballot Action:

HIRSCH, B.: See my Comment under Comment 17-9.

Final Action: Accept

17-47 Log #1028 NEC-P17

(422.53)

Submitter: Larry Johnson, National Presto Industries Inc.

Comment on Proposal No: 17-13


Substantiation: UL has had, for the past 2 years, a task group (I am a member of the group) dedicated to investigating power supply cord issues and will be unveiling its second report in a few weeks. This report will make recommendations for changes to address the root cause of the issue, not add a component onto the product. This is a better way to address the issue and a better way to enforce the changes.

Panel Meeting Action: Accept

Panel Statement: Also refer to the panel action and statement on Comment 17-9.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

ROCK, B.: See reason for NEMA vote on Comment 17-9 (Log #1050).

Comment on Ballot Action:

HIRSCH, B.: See my Comment under Comment 17-9.

Final Action: Reject

17-48 Log #2088 NEC-P17

(422.53)

Submitter: Gary Beideman, Lasko Products, Inc.

Comment on Proposal No: 17-13

Recommendation: Revise text to read as follows:

ARTICLE 424  —  FIXED ELECTRIC SPACE-HEATING EQUIPMENT

17-49 Log #384 NEC-P17

(424.19)

Submitter: Bryan P. Holland, City of North Port

Comment on Proposal No: 17-31

Recommendation: I continue to support this proposal and the revision made by the panel.

Substantiation: The disconnecting means rating should match that of 424.3(B) and be calculated at 125% as revised by the panel.

Panel Meeting Action: Accept

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12
Ballot Not Returned: 1 Gill, C.

Final Action: Accept

17-50 Log #464 NEC-P17

(424.19)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-32

Recommendation: Accept proposal revised:

An approved means shall be provided to simultaneously disconnect all ungrounded conductors of the circuit for the heater, motor controller(s), and supplementary overcurrent device(s) from all fixed electric space heating equipment from all ungrounded conductors.

Substantiation: Since the panel declined to limit disconnecting means to switches and circuit breakers, they should be specifically required to be approved. Lugs, terminals, and wire connectors are means of disconnection which may not be suitable. Ungrounded conductors should be specifically required to be simultaneously disconnected, as required in many code sections.

Panel Meeting Action: Accept in Principle

Revise the first sentence of 424.19 to read as follows:

Means shall be provided to simultaneously disconnect the heater, motor controller(s), and supplementary overcurrent protective device(s) of all fixed electric space-heating equipment from all ungrounded conductors.

Panel Statement: The revised language more clearly presents the requirement and meets the intent of the submitter.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12
Ballot Not Returned: 1 Gill, C.

Final Action: Reject

17-51 Log #764 NEC-P17

(426.32 Exception)

Submitter: Neal Fenster, Thermo Systems Technology, Inc.

Comment on Proposal No: 17-46

Recommendation: We propose to add the revised exception to read:

Where conditions of maintenance and supervision ensure that only qualified personnel will service and maintain the impedance heating elements, and the maximum voltage of the impedance heating elements shall not exceed 80 volts where protected by a ground fault protector set to trip at a value not greater than 30 ma above the inherent leakage of the impedance heating elements, and access to the impedance heating elements is restricted by either of the following conditions.

The impedance heated system is located behind locked enclosures.

Access to the impedance heating system is restricted by fencing or elevation.

ARTICLE 426  —  FIXED OUTDOOR ELECTRIC DEICING AND SNOW-MELTING EQUIPMENT

17-52 Log #46 NEC-P17

(426.32 Exception)
Substantiation: The revised text is proposed to address the Panel’s concern by specifying the maximum voltage rise and ma leakage current based upon system design. It, furthermore, spells out the personnel and physical access restrictions.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided substantiation for using GFPE versus GFCI protection for personnel.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11
Ballot Not Returned: 1 Gill, C.

17-52 Log #504 NEC-P17
Final Action: Accept in Principle (426.50(A))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-47
Recommendation: Accept as revised:
All fixed outdoor deicing and snow melting equipment shall be provided with an approved means for simultaneous disconnection from all ungrounded supply conductors. Where readily accessible to the user of the equipment the branch circuit switch or circuit breaker shall be permitted to serve as the disconnecting means. Switches or circuit breakers used as the The disconnecting means shall be of the indicating type indicate a closed or open position and be provided with a positive lockout provision in the “off” position.

Substantiation: Since the proposal to provide a switch or circuit breaker was rejected, it should be specifically required to be approved, since wire connectors, lugs, links, relays, etc., are also disconnecting means. Disconnection should be simultaneous for ungrounded conductors of the circuit. The disconnecting means of 427.5(A) and 427.5(A) require positive lockout provisions and should be required for these disconnecting means which may be remote from the equipment. The proposal specifies what “indicating type” is. The last sentence should apply to all disconnecting means not just switches and circuit breakers.

Panel Meeting Action: Accept in Principle
Revise 426.50(A) to read as follows:
(A) Disconnection. All fixed outdoor deicing and snow-melting equipment shall be provided with a means for simultaneous disconnection from all ungrounded conductors. Where readily accessible to the user of the equipment, the branch-circuit switch or circuit breaker shall be permitted to serve as the disconnecting means. The disconnecting means shall be of the indicating type and be provided with a positive lockout in the “off” position.

Panel Statement: The revised text more clearly presents the requirements and meets the intent of the submitter.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11
Ballot Not Returned: 1 Gill, C.

17-53 Log #210 NEC-P17
Final Action: Accept (426.52)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 17-49
Recommendation: It is the action of the Technical Correlating Committee that the panel reconsider the proposal and clarify that branch circuit sizing does not provide oversize protection. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation to reconsider. See the panel action and statement on Comment 17-54.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11
Ballot Not Returned: 1 Gill, C.

17-54 Log #978 NEC-P17
Final Action: Accept in Principle (426.52)

Submitter: Mark C. Ode, Underwriters Laboratories Inc.

Comment on Proposal No: 17-49
Recommendation: Revise as follows:
426.52 Overcurrent Protection.
Fixed outdoor electric de-icing and snow melting equipment shall be connected to a protected branch circuit by a branch circuit rated not less than 125 percent of the load and protected by an overcurrent protective device rated at 125% of the load.

Substantiation: It is not the branch circuit that is providing the overcurrent protection as would been the case in the rewrite of the text by the proposal. It is the intent to size the branch circuit and the branch circuit overcurrent protective device at 125%.

Panel Meeting Action: Accept in Principle
Delete 426.52.
Panel Statement: The elimination of 426.52 meets the intent of the submitter because the sizing of the overcurrent protection devices is to be accomplished in accordance with other articles that address sizing for continuous loads. Section 426.4 was revised in 2005 to specify that all fixed outdoor electric deicing and snow melting equipment are continuous loads.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 11
Ballot Not Returned: 1 Gill, C.

ARTICLE 427 — FIXED ELECTRIC HEATING EQUIPMENT

17-55 Log #713 NEC-P17
Final Action: Reject (427.5)

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 17-50
Recommendation: The action should be to Reject.
Substantiation: The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. Code Making Panel 17 should Reject this proposal to coordinate with the other technical committees in the NEC project and with 90.1(C). A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP 17 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBEW, IAEE, ACC, NETA, NEI, SEIA, ASH, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: The ANSI standards referenced in the FPN of the panel action on Proposal 17-50 are not requirements but provide insight for users of the Code.

Number Eligible to Vote: 12
Affirmative: 10 Negative: 1
Ballot Not Returned: 1 Gill, C.

Explanation of Negative Vote:
ROCK, B.- NEEMA supports this comment to oppose the portion of the panel action and panel statement to revise 427.1 FPN. NEAMA continues its position that this reference should not be included in the NEC since the NEC is not a design, installation or maintenance manual. NEC 90.1(C) specifically states: “This code is not intended as a design specification or an instruction manual for untrained persons.”

17-56 Log #880 NEC-P17
Final Action: Reject (427.5)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 17-50
Recommendation: The panel is encouraged to continue to Reject Proposal 17-50.
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
4. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which is a violation of 110.3(B).
5. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 17-55.
ROCK, B.: NEMA supports this comment to oppose the portion of the panel action and panel statement to revise 427.1 FPN. NEMA continues its position that this reference should not be included in the NEC since the NEC is not a design, installation or maintenance manual. NEC 90.1(C) specifically states: “This code is not intended as a design specification or an instruction manual for untrained persons.”

17-57 Log #765 NEC-P17 Final Action: Reject (427.27)

Submitter: Neal Fenster, Thermo Systems Technology, Inc.
Comment on Proposal No: 17-55
Recommendation: We propose to add the revised exception to read:
Where conditions of maintenance and supervision ensure that only qualified personnel will service and maintain the impedance heating elements, and the maximum voltage of the impedance heating elements shall not exceed 80 volts where protected by a ground fault protector set to trip at a value not greater than 30 ma above the inherent leakage of the impedance heating elements, and access to the impedance heating elements is restricted by either of the following conditions.
• The impedance heated system is located behind locked enclosures.
• Access to the impedance heating system is restricted by fencing or elevation.
Substantiation: The revised text is proposed to address the Panel’s concern by specifying the maximum voltage rise and mA leakage current based upon system design. It, furthermore, spells out the personnel and physical access restrictions.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided substantiation for using GFPE versus GFCI protection for personnel.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11
Ballot Not Returned: 1 Gill, C.

17-58 Log #420 NEC-P17 Final Action: Accept in Principle (427.55)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 17-57
Recommendation: Accept revised:
Means shall be provided to simultaneously disconnect all ungrounded conductors of the branch circuit(s) supplying fixed electric pipeline heating equipment, from all ungrounded conductors. The branch circuit switch or circuit breaker shall be permitted as the disconnecting means. The disconnecting means shall be of the indicating type, indicate the open (off) and closed (on) positions and be provided with a positive lockout means for locking in the open (off) position, that is identified for the purpose.
Substantiation: The disconnecting means should be specified to simultaneously disconnect all ungrounded conductors and specify the conductors as a branch circuit since a feeder or service disconnect complies with the literal wording of the first sentence. Indication of open (off) and closed (on) is more specific than “indicating type”. The lockout provisions should be identified for the purpose to preclude makeshift means.
Panel Meeting Action: Accept in Principle
Revise 427.55(A) to read as follows:
(A) Switch or Circuit Breaker: Means shall be provided to simultaneously disconnect all fixed electric pipeline or vessel heating equipment from all ungrounded conductors. The branch-circuit switch or circuit breaker, where readily accessible to the user of the equipment, shall be permitted to serve as the disconnecting means. The disconnecting means shall be of the indicating type and shall be provided with a positive lockout in the “off” position.
Panel Statement: The revised text more clearly presents the requirement and meets the intent of the submitter.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11
Ballot Not Returned: 1 Gill, C.

ARTICLE 430 — MOTORS, MOTOR CIRCUITS, AND CONTROLLERS

11-3 Log #610 NEC-P11 Final Action: Accept in Principle (430.2)

Submitter: Paul Guidry, Fluor Enterprises, Inc.
Comment on Proposal No: 11-17
Recommendation: This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.6(D), 430.22(D), 430.24(B), 430.52(E) and 430.102(A).
Revise text to read as follows:
430.2 Valve Actuator Motor Assemblies. A manufactured assembly consisting of a valve, valve actuator motor, and other components such as controllers, torque switches, limit switches, and overload protection. Valve actuator motor assemblies are also commonly referred to as “motor-operated valves” or “MOV’s.”
FPN: Valve actuator motors have a unique design that can result in significantly different operating characteristics than NEMA Design B motors. Continuous duty motors, such as NEMA Design B motors, are rated in horsepower, which implies a constant torque. Valve actuator motors are neither continuous duty nor constant torque at rated speed. They can be characterized as short duty time, high starting torque motors.
FPN material is from IEEE Std. 1290-1996. Copyright © 1996 IEEE. All rights reserved.
Substantiation: This comment is based on proposal 11-17. It was my understanding in the proposal stage that the panel felt like Valve Actuator Motors (VAMs) should be covered by Article 430 (see panel comment on proposal 11-18). However, instead of adding a new Part XI, it was suggested that the current structure of the Code be modified for any rules regarding VAMs. Adding this definition (directly from IEEE Std. 1290) to 430.2 should satisfy the panel’s concern that the requirements for VAMs won’t be confused with valve modulating motors.
Users in the industrial/petrochemical have tried for years to apply Article 430 to valve actuator motors without success. These motors do not fit into any of the present rules that are in Article 430. I believe they need their own special rules in some areas.
Panel Meeting Action: Accept in Principle
Panel Statement: The submitter’s concerns are addressed by the action on Comment 11-4. See action and statement on Comment 11-4.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-4 Log #814 NEC-P11 Final Action: Accept in Principle in Part (430.2)

Submitter: Paul Guidry, Fluor Enterprises, Inc.
Comment on Proposal No: 11-17
Recommendation: This is not a duplicate comment. A previous comment has been made on this proposal (Log #610) It was brought to my attention during the comment stage that copyrighted material may be an issue with publishing it in the NEC should this comment be accepted.
This comment rewrites the text in the FPN found in the previous comment (Log #610) so the IEEE copyrights shouldn’t be an issue.
This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.6(D), 430.22(D), 430.24(B), 430.52(E) and 430.102(A).
Add text to read as follows:
430.2 Valve Actuator Motor Assemblies (VAMs). A manufactured assembly consisting of a valve, valve actuator motor, and other components such as controllers, torque switches, limit switches, and overload protection. Valve actuator motor assemblies are also commonly referred to as “motor-operated valves” or “MOV’s.”
FPN: Valve actuator motors have considerable differences in operating characteristics as compared to NEMA Design B motors due to the VAMs unique design. NEMA Design B motors are continuous duty and rated in horsepower, which implies a constant torque. Valve actuator motors are usually characterized as short duty time, high starting torque motors and are neither continuous duty or constant torque motors.
Substantiation: Users in the industrial/petrochemical have tried for years to apply Article 430 to valve actuator motors without success. These motors do not fit into any of the present rules that are in Article 430. I believe they need their own special rules in some areas. This comment along with the others identified as companion proposals address this need.
This comment is based on proposal 11-17. It was my understanding in the proposal stage that the panel felt like Valve Actuator Motors (VAMs) should be covered by Article 430 (see panel comment on proposal 11-18). However, instead of adding a new Part XI, it was suggested that the current structure of the Code be modified for any rules regarding VAMs. Adding this definition to 430.2 should satisfy the panel’s concern that the requirements for VAMs won’t be confused with valve modulating motors.
Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel rejects the part of the definition pertaining to the valve and the reference to motor-operated valves (MOVs). The panel also rejects the part of the submitter’s FPN that pertains to NEMA Design B motors. The panel edits the definition and FPN for clarity.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
I-108 Log #69 NEC-P01 Final Action: Hold (430.2)


Submitter: Technical Correlating Committee on National Electrical Code

Proposal on Proposal No: 11-16a

Recommendation: The Technical Correlating Committee rejects the panel action to add a new definition for “Engineering Supervision” to Article 430. The term is used throughout the NEC and if a definition is needed it should be under the purview of Code-Making Panel 1. The Technical Correlating Committee directs that this proposal be sent to Code-Making Panel 1 for consideration of action in Article 100 during the comment phase. This action will be considered by Code-Making Panel 1 as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the Technical Correlating Committee to consider the recommendation contained in Proposal 11-16a for inclusion in Article 100. The panel has considered this proposal and Comment 1-109 from Code-Making Panel 3, Comment 1-110 from Code-Making Panel 14, Comment 1-111 from Code-Making Panel 6, Comment 1-112 from Code-Making Panel 2, and Comment 1-113 from Code-Making Panel 10. The panel concludes that Proposal 11-16a and these Comments be reported as “Hold” for review in the 2011 NEC revision cycle as no consensus presently exists and the issue cannot be resolved in this Code cycle. It requests the Technical Correlating Committee to appoint a Task Group having representation from those panels where the term “Engineering Supervision” has application, to determine if a definition of the term appropriate for general application in Article 100 can be developed.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12


I-109 Log #289 NEC-P01 Final Action: Hold (430.2)


Submitter: Code-Making Panel 14

Proposal on Proposal No: 11-16a

Recommendation: a) Not support Technical Correlating Committee action to include a general definition as the issue is not applicable to CMP-14 texts.

b) See the panel statement on Comment 1-108.

c) “Hold” for review during the 2011 NEC revision cycle.

Submitter: Code-Making Panel 14, Comment on Proposal No: 11-16a

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12


I-110 Log #301 NEC-P01 Final Action: Hold (430.2)


Submitter: Code-Making Panel 14

Proposal on Proposal No: 11-16a

Recommendation: a) This action makes these sections consistent with terms used in some 13 other places within CMP-14 texts and ensures that any action taken on Proposal 11-16a will not impact installations under the responsibility of CMP-14.

b) The proposed definition of “engineering supervision” does not include the responsibility of CMP-14. All engineering functions are considered new material. The Code-Making Panel 3 Task Group states there are present 240.86(A), which is specific to field selected and installed series component overcurrent protection assemblies and is restricted to existing, not new, installations. The Code-Making Panel 3 Task Group states there are 28 instances where variations on this proposed text is employed. In order for this definition to be considered for inclusion into Article 100, each of those instances should be reviewed for the proposed text applicability.

This proposed text should be held for further review by all the affected Code-Making Panels and report back to the 2011 NEC cycle. This is too important to handle within the limited time of a Comment period."

Panel Meeting Action: Hold

Panel Statement: See the panel statement on Comment 1-108.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

11-5 Log #1035 NEC-P11  Final Action: Reject
(430.6(A)(1) and (2))

Submitter: Charles M. Trout, Maron Electric Co. Inc.
Comment on Proposal No: 11-18
Recommendation: This proposal should be Accepted. I am not offering new substantiation but rather I am disagreeing with the Panel Statement. The Panel offers no definitive or technical substantiation that a problem exists with wiring electric motors in accordance with their nameplate full load current. The requirements of 430.6(A) are in direct opposition to the purpose and intent of the Code as stated in 90.1(A) and (C). The Code is not intended as a design specification. The requirements of 430.6(A) mandate electrical design in the branch circuit wiring of electric motors beyond that required by the design of the electric motor. This requirement mandates oversizing motor branch circuit conductors based on the premise of an emergency condition which has not been substantiated. Electric motor replacement entails much more than conductor sizing. Motor mounts, shaft size, and shaft position must be accounted for. Thousands of motors are installed everyday. How many of these electric motors will have an emergency problem where replacement may present a problem that a competent electrician cannot handle.

Substantiation: See above.
Panel Meeting Action: Reject
Panel Statement: The panel rejects the comment.
As specifics of new and replacement motors are often unknown at the time of initial system design or installation, use of the tables provides a consistent source that provides safety over a wide range of motor applications. The AHJ has the authority to accept an installation design based on specific motor data if documentation and substantiation are provided and accepted. Refer to 90.4. Enforcement: No
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-6 Log #611 NEC-P11  Final Action: Reject
(430.6(D))

Submitter: Paul Guidry, Fluor Enterprises, Inc.
Comment on Proposal No: 11-19
Recommendation: This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.22(F), 430.24(B), 430.52(E) and 430.102(A).
Add new 430.6(D) as follows:
430.6(D) Valve Actuator Motors. For valve actuator motors, the rated current shall be the nameplate full-load current. This nameplate current shall be used to determine the ampacity of the branch-circuit conductors covered in 430.22, and 430.24, and the ampere rating of the motor branch-circuit short-circuit and ground-fault protective device.

Substantiation: Valve actuator motors are based on a manufacturer motor size—horsepower like a NEMA Design B, C, D motor. For a given size of VAM, there are 2, 4, 6, and 8 pole motors. The motor sizes are each rated in full-load current and locked rotor current. The conductor size and breaker size should be calculated based on the nameplate full-load current rating. It is impossible to create a table such as 430.250 for full load currents since there are so many variations in the construction of VAMs. And, the VAM assemblies are geared differently for each valve resulting in varying currents for the same size motor.
This comment is based on proposal 11-81. It was my understanding in the proposal stage that the panel felt like Valve Actuator Motors (VAMs) should be covered by Article 430 (see panel comment on proposal 11-81). However, instead of adding a new Part XI, it was suggested that the current structure of the Code be modified for any rules regarding VAMs.
Panel Meeting Action: Reject
Panel Statement: Valve actuator motors (VAMs) are high torque motors and are already covered in 430.6(A)(1).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-7 Log #387 NEC-P11  Final Action: Reject
(Table 430.7(B), FPN (New))

Submitter: Paul Schwartz, FLUOR
Comment on Proposal No: 11-20
Recommendation: Add a FPN below Table 430.7(B) as follows:

To convert to Table 430.7(B) values to the ratio of locked rotor amps to full load amps (LRA/FLA), multiply the Code letter values (kVA per HP with locked rotor) by (Rated Power Factor x Rated Efficiency/0.746).

Substantiation: NEMA MG-1 and the NEC require all induction motors to have a locked rotor code Letter stamped on the motor nameplate. This code letter provides a range of values for kVAR/HP from which the starting current under locked rotor condition can be calculated for a given motor.
Some power system analysis programs use this Code letter as input data for motor models for motor starting and short circuit calculations. However, other programs use LRA and FLA as input data. The purpose of this FPN addition to Table 430.7(B) is to clarify the relationship between the Code Letter value and the ratio of LRA/FLA.

CONVERSION OF THE MOTOR CODE LETTER VALUE TO THE RATIO OF LRA/FLA
Motor HP = kVAR * *FPR* EFFR/0.746 where the subscript R stands for rated

70-288
The Motor Code Letter = kV ALR/HP = kV ALR/(kVAR * PFR)*

The Motor Starting Current in per unit of full load current = kV ALR/kVAR = (sqrt3 * kV * FLA) / LRA/FLA

The Motor Code Letter = kV ALR/HP = (LRA/FLA) * (0.746/PFR * EFFR)

Therefore, the ratio of LRA/FLA = kV ALR/HP * (PFR * EFFR/0.746)

(Note when PFR * EFFR = 0.746, the Code Letter Value equals the ratio of LRA/FLA).

**MEDIUM VOLTAGE INDUCTION MOTOR EXAMPLE**

HP = 13,500 HP

kV = 13,200 V

PFR = 89%

EFFR = 96.5%

FLA = 512.9 A

LRA = 2718.4 A

The LRA/FLA = 2718/512.9 = 5.3

The kV ALR/HP = (kV ALR/HP) * (PFR * EFFR/0.746) = (5.3 * 0.746)/ (0.89 * 0.965) = 4.6

(Note the 530% motor infrared current is much greater than the 460% motor kV ALR/HP).

**CODE LETTER APPLICATION SUMMARY**

It can be seen from the above that there can be a significant difference in the numerical per unit values of kV ALR/HP and LRA/FLA for a given motor. Thus, in modeling motors in a computer program, it is important to determine exactly what the program needs and to validate that the program uses the required data (either kV ALR/HP or LRA/FLA) correctly to get the correct motor model in terms of LRA/HP on the motor per unit transient reactance. Note that not all of the US motor standards require the Code Letter to be included on the motor nameplate. For example, API-541-2004 and API-546-1997 require the locked rotor amps to be included on the motor nameplate. NEMA C50.41-2000 requires the locked rotor amps to be included on the motor nameplate but notes that, when agreed to between the user and the manufacturer, the locked rotor Code Letter may be used.

Based on the above, it is recommended that the above FN1 be added below Table 340.7(B).

**Panel Meeting Action:** Reject

**Ballot Results:** Affirmative: 15

**Number Eligible to Vote:** 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Accept

**Ballot Results:** Affirmative: 15

**Number Eligible to Vote:** 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.

**Panel Statement:** This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.52(E) and 430.102(A).

**Recommendation:** Continue to Reject

**Panel Meeting Action:** Rejected

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

The comment is not related to the original proposal; therefore it is not in compliance with 4.4.2 of the NFPA Regulations Governing Committee Projects.
of the highest rated motor plus the sum of the full-load current ratings of all the other motors in the group, plus the ampacity required for the other loads.

Substantiation: VAMs are rated differently from valve to valve and manufacturer to manufacturer. Some are rated in horsepower, others in kVA or kW. All are rated in full-load current and locked rotor current. These motors are not constant torque motors and a current table cannot be made for them as such 430.250. They are not continuous duty, however a 125 percent multiplier to the nameplate current is sufficient, yet not excessive. The remainder of the text is virtually the same as existing 430.24.

This comment is based on Proposal 11-81. It was my understanding in the proposal stage that the panel felt like Valve Actuator Motors (VAMs) should be covered by Article 430 (see panel comment on proposal 11-81). However, instead of adding a new Part XI, it was suggested that the current structure of the Code be modified by any rules regarding VAMs.

Panel Meeting Action: Reject
Panel Statement: The submitter’s concerns are addressed in 430.6(A)(1) and 430.24.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-13 Log #2327 NEC-P11 (430.28(4)) Final Action: Accept

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 11-34
Recommendation: Reject the Proposal.
Substantiation: The negative commentors are correct and raise substantial issues that make this an unacceptable approach.

This proposal will reduce electrical safety. Overcurrent protection rules in the NEC need to be uniformly applied across application. This revision creates a significant anomaly to that uniformity. The expectation that the system is controlled enough to be able to have such exacting requirements for conductor protection is a flawed expectation.

The current tap rules have served well in a large variety of installations and they are consistent with the engineering and maintenance approaches taken in all installations including large industrial.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-14 Log #615 NEC-P11 (430.52(E)) Final Action: Reject

Submitter: Paul Guidry, Fluor Enterprises, Inc.
Comment on Proposal No: 11-81
Recommendation: This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.24(B), and 430.102(A).

Add new 430.52(E) as follows:

430.52(E) Valve Actuator Motors. Valve actuator motor branch circuits shall be protected at a point of 125% of the motor nameplate full-load current, rating and in accordance with 240.4(B). Circuit breakers shall be of the inverse time type. Fuses shall be of the dual-element time-delay type. It shall be determined that the branch-circuit short-circuit and ground-fault protective device will not open under the most severe normal conditions of service that may be encountered.

Substantiation: VAMs are completely self-protected and are not dependent on the branch-circuit protective device to protect the VAM. The branch-circuit protective device only protects the conductors in this case. This section has been coordinated with 430.22.

Based on the current Code, instantaneous or type MBC breakers wouldn’t be allowed since they’re not a part of a listed assembly with the controller. So, it should be made clear that the breakers shall be inverse time type. Because of the high inrush on locked-rotor, fuses should be DTED type.

This comment is based on proposal 11-81. It was my understanding in the proposal stage that the panel felt like Valve Actuator Motors (VAMs) should be covered by Article 430 (see panel comment on proposal 11-81). However, instead of adding a new Part XI, it was suggested that the current structure of the Code be modified for any rules regarding VAMs.

Panel Meeting Action: Reject
Panel Statement: The submitter’s concerns are addressed in existing Table 430.52.

The existing Table 430.52 for “single-phase motors” and “AC polyphase motors other than wound-rotor squirrel cage other than Design B energy-efficient” applies to AC valve actuator motor assemblies.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-15 Log #2328 NEC-P11 (430.53(D)(4)) Final Action: Accept

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 11-45
Recommendation: Reject the Proposal.
Substantiation: The negative commentors are correct and raise substantial issues that make this an unacceptable approach.

This proposal will reduce electrical safety. Overcurrent protection rules in the NEC need to be uniformly applied across application. This revision creates a significant anomaly to that uniformity. The expectation that the system is controlled enough to be able to have such exacting requirements for conductor protection is a flawed expectation.

The current tap rules have served well in a large variety of installations and they are consistent with the engineering and maintenance approaches taken in all installations including large industrial.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-16 Log #1889 NEC-P11 (430.59 (New)) Final Action: Reject

Submitter: Paul S. Hamer, Chevron Energy Technology Company
Comment on Proposal No: 11-48
Recommendation: This proposal (and its companion Proposals 2-6, 2-88, 2-285 and 11-49 - Comments submitted separately) should be accepted. Add to the end of the proposed wording: This requirement shall become effective January 1, 2011. This aligns with Mr. Weber’s Explanation of Negative for Proposal 2-88 regarding the development of new, life-saving concepts and addresses the Panel Statement of Proposal 2-88. The Proposal wording, and its included phrase “shall be permitted,” is important so the GFCI-S-Ph is identified as a specific permitted alternative. The Panel Statement, “The panel recognizes that the application of this system is permitted to be used for motor circuits as an added technology,” avoids the reality that unless a permitted concept is identified in the NEC, it will not be applied. Adding the delayed effective date would provide the incentive and the necessary time for the Three-Phase Ground-Fault Circuit-Interrupter System (GFCI-S-3Ph) to be further developed and commercialized.

Substantiation: The Panel Statement of Proposal 2-88, the base Proposal for the GFCI-S-3Ph concept, includes ...”The submitter’s substantiation notes that the hazard is when unqualified persons work on equipment without taking the appropriate precautions to deenergize the circuit and verify that circuit is disconnected...”. There are numerous instances where unqualified persons were electrocuted by faulty or defective equipment (see the supporting material submitted with the proposals), and these people may have been protected from electrocution by the proposed GFCI-S-3Ph. The patent applications are pending for the GFCI-S-3Ph as of this date, but further field measurements made since the Proposal submittal date indicate that the distributed phase capacitances on an actual installed three-phase 480 volt power system are balanced enough to permit the sensitivity described in the proposals.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any new motor-related substantiation for reconsideration.

Although the panel rejects the submitter’s comment, this new technology is an important step forward in the protection of electrical systems and personnel. The panel encourages the submitter to return in the next Code cycle with documentation to the effectiveness, reliability, and availability of this new technology.

Again, the panel recognizes that the application of this system is permitted to be used for motor circuits as an added technology.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative:
CACCAMESE, J.: I would encourage the submitter to keep the panel apprised of the availability of this ground-fault protection technology through the proposal stage for the next code cycle. The use of 3-phase GFCI device provides a promising step in the right direction for safety.

11-17 Log #1890 NEC-P11 (430.64 (New)) Final Action: Reject

Submitter: Paul S. Hamer, Chevron Energy Technology Company
Comment on Proposal No: 11-49
Recommendation: This proposal (and its companion Proposals 2-6, 2-88, 2-285 and 11-48 - Comments submitted separately) should be accepted. Add to the end of the proposed wording: This requirement shall become effective January 1, 2011. This aligns with Mr. Weber’s Explanation of Negative for Proposal 2-88 regarding the development of new, life-saving concepts and
addresses the Panel Statement of Proposal 2-88. The Proposal wording, and its included phrase “shall be permitted,” is important so the GFCIS-3Ph is identified as a specific permitted alternative. The Panel Statement of Proposal 11-48 (referred to in this Proposal’s Panel Statement), “The panel recognizes that the application of this system is permitted to be used for motor circuits as an added technology,” avoids the reality that unless a permitted concept is identified in the NEC, it will not be applied. Adding the delayed effective date would provide the incentive and the necessary time for the Three-Phase Ground-Fault Circuit-Interrupter System (GFCIS-3Ph) to be further developed and commercialized.

Substantiation: The Panel Statement of Proposal 2-88, the base Proposal for the GFCIS-3Ph concept, include...” The submitter’s substantiation notes that the hazard is when unqualified persons work on equipment without taking the appropriate precautions to deenergize the circuit and verify that circuit is disconnected...” There are numerous instances where unqualified persons were electrocution by the proposed GFCIS-3Ph. The patent applications are pending for the GFCIS-3Ph as of this date, but further field measurements made since the Proposal submission date indicate that the distributed phase capacitances on an actual installed three-phase 480 volt power system are balanced enough to permit the sensitivity described in the proposals.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any new motor-related substantiation for reconsideration. Although the panel rejects the submitter’s comment, this new technology is an important step forward in the protection of electrical systems and personnel. The panel encourages the submitter to return in the next Code cycle with documentation to the effectiveness, reliability, and availability of this new technology.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative: CACCA MESE J- See statement to Comment 11-16.

11-18 Log #620 NEC-P11 (Table 430.72(B), Note 2) Final Action: Reject
Submitter: Joseph C. Warren, Joseph C. Warren Electrical Consulting Services
Comment on Proposal No: 11-50
Recommendation: Revise text to read: Notes: 2. 400 percent of value specified in Table 310.16 for 60°C conductors. (Table 430.72B)

Substantiation: Note No. 2 of Table 430.72(B) states 400 percent of value specified in Table 310.17 for 60°C conductors. Since Table 310.17 is for free-air ampacities only and subnote No. 2 of Table 430.72(B) is given under column B for conductors within enclosures, Table 310.17 should not be used for this situation.

According to Webster’s dictionary, “free air is air not affected by local conditions”, and “part of the atmosphere that lies above the frictional influence of the earth’s surface”. This means to me that air circulation is not affected, as it is in an enclosure.

You can liken a motor controller to a safe that has no air circulation when closed.

The panel statement about conductors not bundled in enclosures is not correct because many times they are done like this to keep the conductors neat, and they are often installed in boiler rooms where very hot conditions exist.

Substantiation: The panel encourages the submitter to return in the next Code cycle with documentation to the effectiveness, reliability, and availability of this new technology.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative: CACCA MESE J- See statement to Comment 11-16.

11-19 Log #830 NEC-P11 (Table 430.73) Final Action: Accept in Principle
Panel Meeting Action: Acceptor
Panel Statement: The submitter has not provided substantiation that this has been a problem.

Table 430.72(B) is for overcurrent protection and is not used for sizing control circuit conductors.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-20 Log #1319 NEC-P11 (Table 430.81(A)) Final Action: Reject
Submitter: Vincent J. Saporita, Cooper Bussmann
Comment on Proposal No: 11-53a
Recommendation: Modify the proposal so that the phrase “protective device” is not removed from the original wording. It should be included with the phrase “disconnecting means” that was added by the panel.

(A) Stationary Motor of 1/8 Horsepower or Less. For a stationary motor rated at 1/8 hp or less that is normally left running and is constructed so that it cannot be damaged by overload or failure to start, such as clock motors and the like, the branch-circuit disconnecting means or protective device shall be permitted to serve as the control means.

Substantiation: Replacing the words “protective device” with “disconnecting means” made a subtle but significant change. It would preclude the application of a 1/8 hp or less stationary motor from being installed where a Type S fuse is protecting the motor and where removal of the fuse would serve as the disconnecting means (430.109(B)). The phrase “protective device” as 430.81(A) has been in the NEC, without reported issues, since at least the 1947 edition. I don’t believe that the Panel intended to make this subtle but significant change.

Panel Meeting Action: Reject
Panel Statement: For stationary motors of 1/8 horsepower or less, a fuse may be used as the disconnecting means as permitted in 430.109(B). Because a fuse can be considered as the disconnecting means, it can also be considered the controller.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: Saporita, V.: Text from the 1933 NEC through the 2005 NEC specifically allowed the overcurrent protective device to be both the controller (430.81(A)) and the disconnecting means (430.81(A)). For 2008, 430.109(B) still allows the overcurrent protective device to be the disconnecting means but the proposed text only allows the disconnecting means to be the controller. The wording infers therefore, that the overcurrent protective device can also be the controller. (The overcurrent protective device can be disconnecting means, and disconnecting means can be the controller, therefore, the overcurrent protective device can be the controller.) This two-step process adds confusion, which would not be necessary if the text remained unchanged from the 2005 edition of the NEC.

11-114 Log #70 NEC-P01 (Table 430.91) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 11-56
Recommendation: The Technical Correlating Committee directs that this proposal be sent to Code-Making Panel 1 for action. This action will be considered by Code-Making Panel 1 as a Public Comment. The actions taken on Proposals 1-95 and 11-55 relocates Table 430.91 to 110.20.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts this comment and editorially revises the text from the 1933 NEC through the 2005 NEC specifically allowed the overcurrent protective device to be both the controller (430.81(A)) and the disconnecting means (430.81(A)). For 2008, 430.109(B) still allows the overcurrent protective device to be the disconnecting means but the proposed text only allows the disconnecting means to be the controller. The wording infers therefore, that the overcurrent protective device can also be the controller. (The overcurrent protective device can be disconnecting means, and disconnecting means can be the controller, therefore, the overcurrent protective device can be the controller.) This two-step process adds confusion, which would not be necessary if the text remained unchanged from the 2005 edition of the NEC.
11-21 Log #567 NEC-P11 Final Action: Reject (430.102(A))


Comment on Proposal No: 11-60

Recommendation: Revise as follows: 430.102 Location.

(A) Controller. An individual disconnecting means shall be provided for each controller and shall disconnect the controller. The disconnecting means shall be located in sight and be readily accessible from the controller location.

Substantiation: In addition to the substantiation provided by the submitter of Proposal 11-60 (window as a barrier), there are other obstacles (elevation, fencing, and inaccessible terrain) that would prevent access even though a disconnect is “within sight”. The submitter’s concern is well founded, and even though 430.7 provides “readily accessible” requirements, further evaluation is warranted due to safety issues associated with controller disconnect accessibility. This is a safety issue regarding the installation of disconnecting means and readily accessible.

Panel Meeting Action: Reject

Panel Statement: The panel reiterates its position on Proposal 11-60.

The disconnecting means for the controller is not always required to be readily accessible from the controller. See 430.107 for readily accessible requirements. Existing Code text requires that at least one of the disconnecting means be readily accessible.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanations of Negative Vote: CACCA MEG, J.: Due to the nature of motorized equipment and the hazards associated with same, allowing aDisconnecting means that serves the control to qualify as "readily accessible", as indicated in 430.107, does not qualify as the "readily accessible" disconnect for the motor itself is a safety concern that distresses this panel member. Further consideration should be given this arrangement and an assured means of access to the disconnect for the controller location be evaluated.

FAHEY, R.: The panel action should have been to accept this comment. Both the submitter of original Proposal 11-60 and the submitter of this comment have provided sufficient substantiation that shows a safety issue exists. To ensure personnel safety, both disconnects required in 430.102(B) for the controller and 430.102(B) for the motor should be readily accessible. Requiring a readily accessible disconnect at both locations would provide a safety measure for the electrician and maintenance personnel. By providing disconnects in sight and "readily accessible" of the motor controller would solve the safety concerns brought forth in the original proposal.

11-22 Log #771 NEC-P11 Final Action: Reject (430.102(A) Exception No. 1)

Submitter: Louis A. Barrios, Shell Global Solutions

Comment on Proposal No: 11-62

Recommendation: The panel action should have been to “accept” rather than “reject”.

Substantiation: The hazards associated with working on a motor controller are equivalent regardless if the motor is rated 600V and below, or above 600V. The actual control voltage is typically less than 600V in both cases. Therefore, the location of the controller disconnecting means, as long as the provisions in 430.102(A) Exception No. 1 are met should be equivalent regardless of the motor voltage. The intent of this proposal is similar to Proposal 11-62. Proposal 11-62 is a cleaner code change.

Panel Meeting Action: Reject

Panel Statement: The submitter has provided no new substantiation for the panel to reconsider.

The panel reiterates its position on Proposal 11-62. Allowing this exception for lower voltages may reduce worker safety. For equipment less than 600 volts, the physical limitations that apply to equipment over 600 volts do not apply. The required disconnect is for the controller regardless of the control voltage level.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative Vote: HAMER, P.: The panel action should be to accept the comment and allow the exception for all voltages. This exception only applies to a controller’s disconnect, and would negate the requirement for a redundant controller disconnect in a hostile physical environment (in situations where the motor controller may be out in the plant’s operating facility) that could introduce additional hazards to the worker. For most controllers rated 600 volts and below, permitting this exception would have no effect, since the controller’s disconnect and the motor controller are within the same enclosure in the common 600 volt class motor control center.

11-23 Log #612 NEC-P11 Final Action: Accept in Principle in Part (430.102(A) Exception No. 3)

TCC Action: The Technical Correlating Committee directs that the word “Proposed” be replaced in the panel action text of 430.102(A), Exception No. 3 (a) so that it reads as follows: “(a) The valve actuator motor assembly is marked with a warning label giving the location of the disconnecting means.”

This corrects an editorial error.

Submitter: Paul Guidry, Fluor Enterprises, Inc.

Comment on Proposal No: 11-81

Recommendation: This is a companion proposal for the addition of valve actuator motors. Companion proposal section numbers are: 430.2, 430.6(D), 430.22(F), 430.23(B), and 430.52(E).

Add new 430.102(A) Exception No. 3 as follows:

Exception No. 3: The disconnecting means shall not be required to be in sight of valve actuator motor assemblies containing the controller under either condition (a) or (b), provided the disconnecting means is capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be applied where the disconnecting means shall not be required to be in sight of valve actuator motor (VAM) assemblies containing the controller where such a location introduces additional or increased hazards to persons or property and conditions (a) and (b) are met.

(a) The disconnecting means shall not be required to be in sight from valve actuator motor (VAM) assemblies containing the controller where such a location introduces additional or increased hazards to persons or property and conditions (a) and (b) are met.

Panel Meeting Action: Accept in Principle in Part

Panel Statement: The panel rejects the submitter’s part (b) and the FPN. The panel recognizes there could be an increased safety hazard associated with part (b) of the submitter’s recommendation. The FPN note is not required because the text of 430.102(A) Exception No. 3 is considered sufficient.

Final Action: Accept in Principle in Part (430.102(A) Exception No. 3)

Submitter: Louis A. Barrios, Shell Global Solutions

Comment on Proposal No: 11-63

Recommendation: The panel action should have been to “accept” in principle rather than “reject” with the proposed changes to the original proposal as shown below:

Exception No. 3: In industrial installations with written safety procedures, where conditions of maintenance and supervision ensure that only qualified persons service the equipment, the controller disconnecting means shall not be required to be in sight from the controller (motor and the driven machinery location provided the controller disconnecting means is individually capable of being locked in the open position). The provision for locking or adding a lock to the controller disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed.

Panel Meeting Action: Accept in Principle in Part

Panel Statement: The panel rejects the expansion of the exception to industrial locations. The panel chooses not to expand the exception beyond valve actuator motors (VAM) assemblies.

Final Action: Reject
11-25 Log #71 NEC-P11 (430.102(B)) Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 11-67
Recommendation: The Technical Correlating Committee directs the panel to review the action on Proposals 11-67 and 11-68 and revise their action to make it clear as to what part of 430.102(B) the Exception is intended to apply. This action is being canvassed by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects. Panel Meeting Action: Revise Panel Statement: The panel accepts the direction of the TCC to review and clarify the panel action.
See the panel action and statement on Comment 11-27.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-26 Log #568 NEC-P11 (430.102(B)) Final Action: Reject

Comment on Proposal No: 11-64
Recommendation: Revise as follows: 430.102 Location.
(B) Motor. A disconnecting means shall be located in sight and be readily accessible from the motor location and the driven machinery location.
Substantiation: In addition to the substantiation provided by the submitter of Proposal 11-60 (window as a barrier), there are other obstacles (elevation, fencing, and inaccessible terrain) that would prevent access even though a disconnect is visible. The submission is supported by CSAs 430.7 and even though 430.7 provides "readily accessible" requirements, further evaluation is warranted due to site safety associated with controller disconnect accessibility. This is a safety issue regarding the installation of disconnecting means and readily accessible.
Panel Meeting Action: Reject
Panel Statement: The panel reiterates its position on Proposal 11-64. The disconnecting means for the motor is not always required to be readily accessible from the point of disconnect. See 430.107 for readily accessible requirements. Existing Code text requires that at least one of the disconnecting means be readily accessible.
In addition, the definition of "in sight from" allows up to 50 feet between the disconnecting means and the motor. The disconnecting means and the motor do not have to be accessible from each other.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

FAHEY, R.: The panel action should have been to accept this comment. Both the submitter of original Proposal 11-64 and the submitter of this comment have provided sufficient substantiation that shows a safety issue exists. Adding "readily accessible" to this code section would be a very important step forward for worker safety, readily accessible will reiterate the need to have this disconnect available for the service personnel. 430.107 does, in fact, require one of these disconnecting means to be readily accessible. I believe if the panel would have accepted both Comments 11-26 and 11-21, the panel would be making the workplace safer. Providing disconnects at both locations which are readily accessible will provide the personnel who use these devices with a safer workplace. If this disconnect is capable of being reached quickly, without having the obstacle of locked doors with windows (within sight), located between the disconnect and the motor, the personnel will have the ability to use the disconnect. When the disconnect is behind a locked door with a window, the personnel may and sometimes does work the equipment energized due to production concerns or the urgency to keep the process operational. If the disconnect is important enough to be located in sight from, the disconnecting means should then be important enough to be readily accessible.

11-27 Log #792 NEC-P11 (430.102(B)) Final Action: Accept

TCC Action: The Technical Correlating Committee directs that the accepted text be revised to read as follows: "430.102(B) Motor. A disconnecting means shall be provided for a motor in accordance with (1) and shall be provided for the motor with (2).
(1) Separate Motor Disconnect. A disconnecting means for the motor shall be located in sight from the motor location and the driven machinery location.
(2) Controller Disconnect. The controller disconnecting means required in accordance with 430.102(A) shall be permitted to serve as the disconnecting means for the motor if it is located in sight from the motor location and the driven machinery location.
Exception: The disconnecting means for the motor shall not be required under either condition (a) or (b), provided the controller disconnecting means are readily accessible in accordance with 430.102(A) is individually capable of being locked in the open position. The provision for locking or adding a lock to the controller disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed.
(a) Where such a location of the disconnecting means for the motor is impracticable or introduces additional or increased hazards to persons or property.
(b) In industrial installations, with written safety procedures, where conditions of maintenance and supervision ensure that only qualified persons service the equipment.
FPN No. 1: Some examples of increased or additional hazards include, but are not limited to, motors rated in excess of 100 hp multimotor equipment, submersible motors, motors associated with adjustable speed drives and motors located in hazardous (classified) locations.
FPN No. 2: For information on lockout/tagout procedures, see NFPA 70E-2004, Standard for Electrical Safety in the Workplace.

Comment on Proposal No: 11-69
Recommendation: This Proposal should be Accepted.
Substantiation: Most colleges and universities have laboratory, hospital and manufacturing facilities at least as complex as any found out in "industry". Space is always at a premium in legacy mechanical rooms and acceptance of this proposal would give some flexibility in designing HVAC renovations that might otherwise result in a net gain in property. The term "industrial institutional" itself may be an artifact of an earlier era in which manufacturing plants were more complex and better managed than the building systems we see in higher education today.
The panel rejects the change “not less than 100 percent.” The exception to the larger manufacturers, even our smaller colleges and universities have safety programs that exceed the safety programs of the more common small and medium-sized manufacturer.

Unfortunately, however, not all colleges and universities operate in jurisdictions where the general purpose clause of 90.4 is exercised even if written procedures are presented to the inspector. Relaxing the motor disconnect exception would permit the use of limited resources to other purposes where permanent staff is well trained.

Panel Meeting Action: Reject
Panel Statement: The panel reiterates its position on Proposal 11-69.
It is the panel’s intent to provide the highest level of safety for all facilities; therefore, the expansion of this exception will reduce the level of safety in many other facilities.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-29 Log #465 NEC-P11  Final Action: Reject (430.109(A)(1))

Submitter: Dan Leaf, Seneca, SC
Recommendation: Accept proposal.
Substantiation: The proposal provides specifics in addition to HP requirements which alone is not comprehensive and should not be the only criterion. Proposal clarifies suitability as specified in 110.3(A)(1)(7)(83). Switches do not generally have instructions for use per 110.3.
Panel Meeting Action: Reject
Panel Statement: NEC 110.3(A)(1)(7) provide the information for the motor switch the submitter is requesting. Providing the same requirement in this Code section would be redundant.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-30 Log #1089 NEC-P11  Final Action: Accept (430.110 Exception)

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 11-75
Recommendation: Revise the panel action text by deleting the words “without fuse holders” so that the final text reads:
Exception: A listed unfused motor circuit switch having a horsepower rating not less than the motor horsepower shall be permitted to have an ampere rating not less than 115 percent of the full load current rating of the motor.
Substantiation: The wording “unfused” and “without fuse holders” is redundant. I agree with the panel changing from “nonfused” to “unfused”, but adding the “without fuse holders” implies that there is an unfused switch with fuse holders. The UL White Book describes switches without fuseholders as “unfused”.
I agree with the panel’s rejection of the balance of the original proposal. The panel is correct that the intended percentage is 115% and that molded case switches should not be included in the Exception because they should be sized to comply with the main rule.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-31 Log #438 NEC-P11  Final Action: Reject (430.110(C)(2) Exception)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 11-75
Recommendation: Revise panel action:
Exception: A listed unfused motor circuit switch without fuseholders having a horsepower rating not less than the motor horsepower rating or a listed molded case switch shall be permitted to have an ampere rating not less than 115 percent of the current rating of the motor.
Substantiation: “Unfused” seems to be superfluous. The phrase “less than 115 percent” does not establish a lower limit; is 90 percent acceptable? Molded case switches are permitted in 430.109(A)(2) and they and motor circuit switches are rated for 100 percent of their amperage rating and such use would comply with 110.3(A) and (B). If not, why not?
Panel Meeting Action: Reject
Panel Statement: The panel notes that the submitter intended to refer to 430.110(A)(1) Exception rather than 430.110(C)(2) Exception. The panel reiterates its position on Proposal 11-75. The panel rejects the change “not less than 100 percent.” The exception reflects the same percentage value as does the main rule.
Section 430.109(A)(1) requires a motor-circuit switch to be rated in horsepower. In the exception to 430.110(A), the horsepower rating of the switch must equal or exceed the horsepower rating of the controlled motor. Any ampere rating included on the motor circuit switch is not required to comply with the main rule and can be less than the 115 percent.

11-32 Log #502 NEC-P11  Final Action: Reject (430.227)

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 11-63
Recommendation: Accept revised second sentence:
The provision for locking shall be identified for the purpose or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed.
Substantiation: It is somewhat self-evident the locking means will be at or on the disconnecting means. The provisions should apply to all disconnecting means, not limited to switches and circuit breakers. Locking means should be identified for the purpose.
Panel Meeting Action: Reject
Panel Statement: The revised text from Proposal 11-83 for the second sentence is similar to text found in 430.102(B) Exception for motor installations under 600 volts, thereby creating consistency between similar requirements.

Product standards require testing of products for specific uses that would therefore limit their use to the specific application. Locking means are required by 110.3(B) to be installed in accordance with any listings and/or instructions provided by the manufacturer.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-33 Log #72 NEC-P11  Final Action: Accept (430.242(3))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 11-86
Recommendation: The Technical Correlating Committee directs the panel to clarify the action on this proposal as to whether or not they intend to include references to the other Articles between 500 and 517. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to review and clarify the panel action.
See panel action and statement on Comment 11-34.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-34 Log #263 NEC-P11  Final Action: Accept (430.242(3))

Submitter: Stanley J. Fölz, Morse Electric, Inc.
Comment on Proposal No: 11-86
Recommendation: Revise text to read:
(3) If in a hazardous (classified) location. As described in 500.5 and 517.60.
Substantiation: 500.5 and 517.60 are not the only classified areas that would apply in this case. Rather than create a laundry list of classified locations that would apply, the sentence should be allowed to stand alone in referring to classified locations.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-35 Log #791 NEC-P11  Final Action: Hold (430.243)

TCC Action: The Technical Correlating Committee directs that both this comment and Proposal 11-87 be reported as “hold” and submitted to Code Making Panel 5 for action in 250.114 during the next cycle.
The revisions made by the panel to 430.243 creates correlation issues with 250.114(2) and 250.114(2), Exception. 250.114(2) continues to only require grounding where the cord and plug connected equipment is operating at over 150V to ground. The exception to 250.114 exempts all motors from grounding where they are guarded.
Submitter: Charles A. Goetz, Underwriters Laboratories Inc.
Comment on Proposal No: 11-87
Recommendation: Revised from 2005 edition as follows:
250.114 Portable Motors. The frames of portable motors supplied by a premises wiring system that operate at 50 V or more over 150 volts to ground shall be guarded or grounded unless guarded or isolated from contact.
FPN No. 1: See 250.114(4) for guarding of portable appliances in other than residential occupancies.
FPN No. 2: See 250.119(C) for color of equipment grounding conductor.
Exception No. 1: Listed motor operated tools, listed motor operated appliances, and listed motor operated equipment shall not be required to be grounded where protected by a system of double insulation or its equivalent. Double insulated equipment shall be distinctly marked.
GOETZ, C.: It is understood that panel only modified the defined term for “Leakage Current Detection and Circuit Interruption (LCDI)” to use the terminology found in the product standard. The balance of the definition is unchanged by the panel action.

GOETZ, C.: During the ROC meeting, the panel agreed to editorially modify the correct term could just as well be used. The Panel Statement that “the frames of portable motors supplied by a premises wiring system and that operate at 50V or more shall be grounded unless guarded or isolated from contact.”

ARTICLE 440 — AIR-CONDITIONING AND REFRIGERATING EQUIPMENT

11-36 Log #397 NEC-P11 Final Action: Accept in Principle (440.2)

Submitter: Earl W. Roberts, Reptee
Comment on Proposal No: 11-90
Recommendation: Accept the proposal as written.
Substantiation: The English language is used in this text, so let’s use it. Just because some other organization may have used incorrect English is NO excuse to change it. A Device is a Device. The Panel substantiation attempts to justify its position because the incorrect language “is an integral component of a cord set”.

The correct term could just as well be used. The Panel Statement that “the frames of portable motors supplied by a premises wiring system and that operate at 50V or more shall be grounded unless guarded or isolated from contact.”

11-37 Log #569 NEC-P11 Final Action: Reject (440.14 Exception No. 1)

Comment on Proposal No: 11-96
Recommendation: Revise as follows:
440.14 Location. Exception No 1. Delete the exception in its entirety.
Substantiation: The installation and application of a disconnecting means within sight does not hinder the operation of air-conditioning equipment as applied to an industrial process when the conditions include written safety procedures, and the conditions of maintenance and supervision are only performed by qualified personnel. By placing a disconnect switch within sight, safety is assured.

Panel Meeting Action: Reject
Panel Statement: The panel reiterates its position on Proposal 11-96. The submitter has not provided any new or additional substantiation. On the exception as written provides safeguards for qualified persons. The conditions listed in the exception specifically limit the problem with the installation of portable motors that necessitated the revision. The requirements in Section 250.114 appropriately cover grounding for residential and non-residential applications of motor operated appliances. In addition, (portable) equipment, connected by a cord and plug, can be double insulated, which is neither grounded nor guarded, and would not comply with the revised section 430.243. The current section 250.114 permits listed double insulated equipment to be utilized without need for grounding, guarding or isolation.

To address these issues, the recommended text for 430.243 has been revised to (1) include provision to omit grounding for frames of motors rated 50V or less; (2) add exception for double insulated equipment similar to the current exception to 250.114; and (3) add exception to refer to section 250.114 for listed motor-operated appliances, and delete Fine Print Note 1.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative:
GOETZ, C.: During the ROC meeting, the panel agreed to editorially modify the recommended text as follows: “The frames of portable motors supplied by a premises wiring system and that operate at 50V or more shall be grounded unless guarded or isolated from contact.”

FPN: Circuit breakers that open as a result of a ground fault or short circuit at or near their maximum interrupting rating shall be tested or replaced before reenergizing the motor circuit. NEMA A4B Guidelines for Inspection and Preventive Maintenance or MCCBs Used in Commercial and Industrial Applications is a source for correct procedures to follow.

Substantiation: The submitter’s original substantiation shows the need for the insulator maintainer being aware of the hazard of re-energizing a breaker without clearing of a fault; however, a FPN would make the qualified person performing work aware of the existence of the proper procedure needed for safe work practices.

Panel Meeting Action: Reject
Panel Statement: The recommendation of this proposal is not part of the electrical installation requirements of the NEC. Refer to the recommendations in NFPA 70B.

This issue is already addressed in 225.3 of NFPA 70E. The magnitude (e.g., 5KA, 10KA, 20KA fault) of fault current for a specific event cannot readily be ascertained in the field.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative:
CACCAMESE, J.: The addition of a fine print note informing the user that guidelines exist regarding the precautions associated with energizing a circuit breaker that has operated as a result of a ground fault or short circuit is at the least reasonable. While the panel statement is correct in that this information is available in NFPA 70B and 70E, to provide guidance in NFPA 70 or at least provide a FPN that directs the user to the referenced NFPA codes and standards. In regard to the fault level imposed, one must presume that when a fault occurs it is at the maximum value of the breaker’s withstand rating. Finally, a FPN would make the qualified person performing work aware of the existence of the proper procedure needed for safe work practices.
11-39 Log #1127 NEC-P11  Final Action: Reject
(440.60)

Comment on Proposal No: 11-104
Recommendation: Change the value from 250 to 277 Volts.
Substantiation: Please see statement for Proposal 11-104.
Panel Meeting Action: Reject
Panel Statement: No additional substantiation has been presented for consideration.
Increasing the voltage level to 277 volts will not enhance a safer installation.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-40 Log #1128 NEC-P11  Final Action: Reject
(440.60)

Comment on Proposal No: 11-105
Recommendation: Revise the third sentence in 440.60 as follows:
The provisions of Part VII cover equipment rated not over 277 volts, single phase, and such equipment shall be permitted to be cord- and attachment-plug connected.
Revise second paragraph: A room air conditioner that is rated three phase or rated over 277 volts shall be directly connected to a wiring method recognized in Chapter 3 and provisions of Part VII shall not apply.
Substantiation: See substantiation with Proposal 11-105.
Panel Meeting Action: Reject
Panel Statement: No additional substantiation has been presented for consideration.
Increasing the voltage level to 277 volts will not enhance a safer installation.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-41 Log #1129 NEC-P11  Final Action: Reject
(440.62(A)(2))

Comment on Proposal No: 11-106
Recommendation: Revise to read: Its rating is not more than 40 amperes and 277 volts, single phase.
Substantiation: Please see substantiation with Proposal 11-104.
Panel Meeting Action: Reject
Panel Statement: No additional substantiation has been presented for consideration.
Increasing the voltage level to 277 volts will not enhance a safer installation.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

11-41a Log #CC1100 NEC-P11  Final Action: Accept
(440.65)

Submitter: Code-Making Panel 11,
Comment on Proposal No:
Recommendation: Change the title of 440.65 to read as follows: 440.65 Leakage-Current Detector-Interrupter (LCDI) and Arc Fault Circuit Interrupter (AFCI)
Substantiation: See action and statement on Comment 11-36.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

13-4 Log #718 NEC-P13  Final Action: Accept
(445.3)

Submitter: Robert Kelleher, Paramount Electrical Services
Comment on Proposal No: 13-4
Recommendation: Continue to Reject
Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This Fine Print as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 13 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EIEEE, IAEI, ACC, NETA, NEI, SELA, ASES, API, ASHE, AHAM,ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Ballot Not Returned: 1 Gustafson, R.

13-5 Log #866 NEC-P13  Final Action: Accept
(445.3 (New))

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 13-4
Recommendation: The panel is encouraged to continue to Reject Proposal 13-4.
Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNS.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The Fine Print should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNS are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the Fine Print may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Ballot Not Returned: 1 Gustafson, R.

13-6 Log #1963 NEC-P13  Final Action: Reject
(445.13)

Submitter: Elliot Rapapport, Electro Technology Consultants
Comment on Proposal No: 13-7
Recommendation: Change “250.30(A)” to “250.30(A)(8)”.
Substantiation: The reference to 250.30(A) is too general since it includes grounding electrode conductors which are not intended to carry ground fault currents.
Panel Meeting Action: Reject
Panel Statement: Refer to the substantiation on Proposal 13-7. “Accepting the revised text will identify that the conductors in question are part of a “system” as opposed to a service which is supplied by a utility. Section 250.30A(2) and (8) contain the proper sizing requirements and are a more appropriate reference for the systems which are the subject of 445.13.”
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 2
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
HORNBERGER, B.: The comment should be accepted. The commenter references a more specific area of the code which applies to the sizing of conductors that must carry ground fault current. Reference to the entire section of 250.30A applies to sizing of other parts of the grounding system which do not apply to separately derived system generators. This comment supports the negative vote comment by R. Swine in the Proposal balloting stage.
RAPPAORT, E.: The panel statement is correct but the panel action is not. The reference in the proposal to “250.30(A)” is too inclusive and should be changed to “250.30(A)(2) and (8)” to limit the text to sections that are applicable.
Comment on Affirmative:
GALLO, E.: This comment should be accepted in principle with the recommendation revised as change “250.30(A)” to “250.30(A)(2) or 250.30(A)(8)” to provide clarity and correlate with the panel statement.
The NEC does not require locking provisions with other disconnects for generators. If the text added by panel action is not deleted, an exception should be created for portable, RV, and commercial vehicle generator types: “Disconnects for portable, recreational vehicle, and other mobile vehicle generators are not required to be lockable in the open position.

Panel Meeting Action: Reject

Panel Statement: The disconnect must be lockable in the open position to provide a means to lockout/tagout the generator supply when working on equipment powered by the generator. In the case of the portable generators noted by the commenter, compliance with (1) and (2) would obviate the need for the disconnect switch altogether.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Ballot Not Returned: 1 Gustafson, R.

Submitter: Lawrence A. Bey, Cummins Power Generation

Comment on Proposal No: 13-9
Recommendation: Reject the proposal.

Substantiation: The substantiation given for the proposal is not correct. Locking the disconnect in the open position does not provide additional safety for someone working on the generator, because locking the disconnect does not prevent the line terminals from being energized or the prime mover from starting and running. The generally accepted safety procedure for working on generators is to disable the driving means, typically by use of the prime mover controller start/stop switch and/or disconnecting the starting batteries. The NEC does not require locking provisions with other disconnects for services, motors, etc., and there is no disconnect locking provisions required for all installations in Article 110; so it is not clear why generator disconnects should be singled out for locking provisions.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-7.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Ballot Not Returned: 1 Gustafson, R.

Submitter: Lawrence A. Bey, Cummins Power Generation

Comment on Proposal No: 13-9
Recommendation: Add “or within locked outdoor enclosures” after “lockable in the open position” so that the new clause reads “lockable in the open position or within locked outdoor enclosures.”

Substantiation: 110.26(F)(1) requires a suitable enclosure to outdoor electrical equipment that provides protection from unauthorized personnel. Where the generator is outdoors in a locked enclosure, the requirement for locking the disconnect open should not apply.

Panel Meeting Action: Reject

Panel Statement: There is no requirement for the enclosure to meet the lockout/tagout rules. The presence of an enclosure does not obviate the need for locking out the disconnect. Also, see panel action and statement on Comment 13-7.

Submitter: Steve Englund, Cummins Power Generation

Comment on Proposal No: 13-9
Recommendation: Delete text added by panel action, “lockable in the open position.”

Substantiation: As proposed, the provision for lockable disconnect would be interpreted as applying to all generators types not covered by the exceptions, including generator types such as portable, RV, and commercial vehicle where a lockout is not needed to provide safety. Persons working on these types of generators or the electrical circuits or equipment connected to these generators, will be in sufficient proximity to the entire system so as to assure they have control over the status of the generator, circuits, and equipment.

Also, disconnect for these generators is generally provided by recognized supplementary protectors that are not available with features or accessories that can be added to provide a lockout means. Requiring a lockout means would be a substantial burden for manufacturers of RV, CM, portable, and home standby gensets as small supplementary protectors that are used are not directly procurable with a look out hasp, and if available, would be a more expensive part and may also require new generator features to fit the revised protectors.

This submitter recognizes the panel might believe that there is relief for the mentioned generator types due to exception (1), however, applicability of this exception for these generator types is an untested concept.

If the text added by panel action is not deleted, an exception should be created for portable, RV, and commercial vehicle generator types: “Disconnects for portable, recreational vehicle, and other mobile vehicle generators are not required to be lockable in the open position.

Submitter: Gustafson, R.

Comment on Proposal No: 13-9
Recommendation: Reject the proposal.

Substantiation: 110.26(F)(1) requires a suitable enclosure to outdoor electrical equipment that provides protection from unauthorized personnel. Where the generator is outdoors in a locked enclosure, the requirement for locking the disconnect open should not apply.

Panel Meeting Action: Reject

Panel Statement: There is no requirement for the enclosure to meet the lockout/tagout rules. The presence of an enclosure does not obviate the need for locking out the disconnect. Also, see panel action and statement on Comment 13-7.
(445.19) **Submission:** Michael Flegel, Reliance Controls Corporation

**Comment on Proposal No:** 13-11

**Recommendation:** Revise text to read as follows:

Ground-Fault Circuit Interrupter Protection for Receptacles on Bonded Neutral Portable Generators. All 120 and 120/240 volt, single-phase, 15- and 20-ampere receptacle outlets that are part of a portable generator where the grounded conductor and grounding conductor are bonded shall have listed ground-fault circuit interrupter protection for personnel.

**Substantiation:**

A requirement for GFCI protection on all receptacles on all portable generators that are not applications is not necessary and may be undesirable based on the following facts:

1. In Article 590.6(A), GFCI protection can be supplied by add-on devices and does not have to be built into the generator receptacles. One reason this option exists is to comply with the exception in 590.6(A) where GFCI protection is not allowed to supply equipment that would create a greater hazard if power was interrupted or having a design that is not compatible with GFCI protection.

2. Article 525.23(C) does not allow GFCI protection on egress lighting.

3. Some applications have safety records that do not require GFCI protection. These safety records are easily supported by sound technical reasoning. One of these applications is Article 702, Optional Standby Systems. My following comments will be on these systems with a 120/240 volt single phase generator:

   a) The majority of Optional Standby Systems are used for home standby power when utility power fails. In most applications, this happens infrequently and in an environment void of power tools and heavy equipment that you would see on a construction site. As a result, there is less likelihood the equipment and cords are worn or damaged.

   b) UL and the CPSC did research for STP2001 to find reported injuries or deaths when using a portable generator to power a premise wiring system. They found one case but not enough information was available to conclude that GFCI protection would have saved this life.

   c) Very few people, if any, ground their generator with a ground rod and bond it to the ground frame of the generator. Some generators don’t have a connection between generator ground and the neutral (floating neutral). As a result, generators do not have a connection to earth which means no ground faults can exist. There can be failures in the isolation but this is remote especially in the benign home standby environment. For a catastrophe to occur there has to be two things that happen to the isolation. In a floating neutral generator, the first failure would have to be so unique that it has to make a connection between the neutral and the earth that doesn’t involve a hot lead shorting to the neutral and tripping the generator circuit breaker. In a bonded neutral generator, a good connection between the generator frame and earth has to exist. The second isolation failure that has to occur connects the person standing on the ground to a hot lead coming from the generator, again unique enough that it doesn’t short a hot and trip the circuit breaker.

   d) People are instructed to plug in the power cord into the generator before they start the generator and remove it after they stop the generator, thus people do not have to handle the cord when the generator is running.

   e) As soon as the generator is plugged in to the house, the generator ground is bonded with the neutral through the service entrance panel and a good connection between the generator ground and earth is made. Also, since home standby systems are non-separated derived systems with a common neutral between the generator and the utility, the ground is bonded to neutral at the service entrance. The system no longer has double isolation. This single isolation seems sufficient based on points 3a, 3b, 3c, and 3d above. Even if people handle the cord with the generator running, the protection reverts to double isolation as soon as it is unplugged from the house.

   f) If GFCI protection is added to generators as stated in the proposal, then the bonded neutral generator cannot be connected to a premises wiring system using a conventional two-pole transfer switch. This will require a system using a three-pole transfer switch. Floating neutral generators can use a conventional two-pole transfer switch. Almost all the installed home standby systems in the US have two pole transfer switches. Both floating and bonded neutral generators are used. There will be a great deal of confusion to the homeowner trying to make a decision especially on a replacement generator with GFCI protection as proposed. If they find themselves with a GFCI protected bonded neutral generator and a conventional two-pole transfer switch, they will find ways to make them work which will have a negative effect on safety like cutting off the ground blade on the cord plug to the generator.

   g) If GFCI protection is required for all generators, the cost of generators and transfer switches will increase. People will probably be willing to spend more money on generators but will have less money left to buy the more expensive three pole transfer switches. Transfer switch use will decrease. Back feeding causing injury to utility workers and others is a widely documented safety issue which will be made worse by adding GFCI protection to all portable generators.

   h) A floating neutral generator is safe based on isolation, and GFCI protection adds cost while adding no additional level of safety.

   i) Switching the neutral (three pole transfer switch) is more prone to failure than a solid connection (two pole transfer switch). Losing the neutral can create unsafe conditions.

**Recommendation:**

Currently floating neutral generators have more than enough levels of safety to prevent injury without GFCI protection, especially in the home standby environment. Adding unnecessary expense to these systems will decrease the use of transfer switches and create a larger back-feeding safety problem which is already serious.

Not providing GFCI protection on 120/240 volt receptacles on bonded neutral generators will allow people to use new generators with existing transfer switches without creating unsafe modifications and eliminating the need to switch the neutral which is more likely to cause problems than a solid neutral connection. This also allows compliance with sections of the code that prohibit GFCI protection for certain equipment. I don’t believe the safety records indicate that drastic and immediate action is required and more discussion may be needed before the final outcome is determined.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel action and statement on Comment 13-10.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 11 Negative: 3

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See My Explanation of Negative on Comment 13-10.


RAPPAORT, E.: GFCI receptacles should be required on 15 and 20 ampere, 125 volt receptacles where individual loads are used. 30 ampere and 125/250 volt receptacles will be used to feed multiple loads such as residences. If the premises wiring is grounded, the GFCI will trip making it unsafe. This will likely result in modifications to the generator wiring that could make it unsafe. The GFCI receptacles on portable generators should be limited to 15 and 20 ampere, 125 volt ratings.

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**Substantiation:** Although I support GFCI protection for most every situation, GFCI protection should not be required in circuits where it adds cost without any benefit. Requiring GFCI protection on all portable generators is unnecessary. GFCI protection makes sense for non-isolated generators that have a connection to ground, but for generators where the neutral and ground are isolated, the GFCI provides no additional protection.

Isolated generators are commonly used to provide temporary power for homes when the utility power is out, and the ground and neutral are tied together downstream at the service for the house. There is appropriate GFCI protection within the house, and a GFCI at the generator provides no benefit.

I suggest that the Code Panel establish a task group to thoroughly think through which applications are appropriate, and which are not, for GFCI protection. When the safety record is good, it is irresponsible to add cost without benefit.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel action and statement on Comment 13-10.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 13 Negative: 1

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See My Explanation of Negative on Comment 13-10.
13-13 Log #1965 NEC-P13 Final Action: Reject (445.19)

Submitter: Elliot Rappaport, Electro Technology Consultants
Comment on Proposal No: 13-11
Recommendation: This proposal should be rejected.
Substantiation: The requirements for ground fault protection is best understood by CMP 5 and should be centralized in Article 250.
Panel Meeting Action: Reject
Panel Statement: Application of GFCI protection is not a grounding method. Placing the requirements in Article 250 will do nothing to protect the users of portable generators.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Gustafson, R.
Explanation of Negative: See My Explanation of negative vote on Comment 13-11.

13-14 Log #2239 NEC-P13 Final Action: Reject (445.19)

Submitter: Wes Hoppler, American Power Technologies Inc.
Comment on Proposal No: 13-11
Recommendation: Revise text to read as follows:
All 120 and 120/240 volt single phase 15-, 20-, and 30 ampere receptacle outlets that are a part of a portable generator shall have listed ground fault circuit interrupter protection for personnel.
Substantiation: The requirement for 120/240 volt receptacles to have GFCI protection will cause many more dangerous conditions to exist. If adopted as proposed, future built portable generators will be incompatible with previously code conforming installations of 2 pole transfer switches that are part of the premises wiring. Instead of reducing the problems with safe generator usage during power outages, many new dangerous configurations may be attempted to get future built generators to work with existing transfer switches. The application should be regulated (temporary power usage for construction, maintenance...), not the equipment (all generators). For non-premises wire connected applications GFCI adapters could be required in lieu of GFCI protected 120/240 volt receptacle outlets on the generator.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-10.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Gustafson, R.

13-15 Log #331 NEC-P13 Final Action: Accept (445.19 (New 445.20))

Submitter: L. Keith Loefland, International Association of Electrical Inspectors
Comment on Proposal No: 13-11
Recommendation: Revise proposed wording to read as follows:
Ground-fault Circuit Interruption Protection for Receptacles on Portable Generators. All 120 and 120/240 volt, single-phase, 15- and 20- and 30-ampere receptacle outlets that are a part of a portable generator shall have listed ground-fault circuit interrupter protection for personnel.
Substantiation: This new proposed requirement for GFCI protection on receptacle outlets serves as a reference to the voltage rating of the receptacle. The referenced voltage rating of the receptacle should match the voltage rating for receptacles referenced to in 406.2(B). The submitter of the original proposal referenced 125-volt rated receptacles as well.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 13-11.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Gustafson, R.

13-16 Log #891 NEC-P13 Final Action: Reject (445.19 (New 445.20))

Submitter: Paul Schnackenberg, Gen/Tran Corp.
Comment on Proposal No: 13-11
Recommendation: Change second sentence of proposed 445.20 to read:
All 15 and 20 ampere receptacle outlets that are a part of a portable generator, with a bonded neutral, shall have GFCI protection for personnel.
Substantiation: In searching through catalogs, tool supply outlets and rental companies, NO tools have been found on the market that use 30A-125V plugs. The only use of a 125/250V outlet on a construction site is to power a “Spider Box” which already have GFCI protection. 120/240V GFCI receptacles used with listed transfer switches DO NOT WORK. These GFCIs trip instantly in this application. We have a 25 year history of this problem.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-10.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 2 Negative: 0
Gustafson, R.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-11.

13-17 Log #1479 NEC-P13 Final Action: Reject (445.19 (new 445.20))

Submitter: James Allison, Mechanical Products Co.
Comment on Proposal No: 13-11
Recommendation: Revise as follows:
Ground-Fault Circuit Interrupter Protection for Receptacles on Portable Generators. All 120 and 120/240 volt, single-phase, 15- and 20- and 30-ampere receptacle outlets that are a part of a portable generator shall have listed ground-fault circuit interrupter protection for personnel.
Substantiation: Mechanical Products Co. recommends that GFCI protection NOT be required on 30 amp 120/240 VAC twist-lock receptacles for use with portable generators. One of the biggest arguments against this proposal is that it will necessitate the installation of a more expensive three-pole transfer switch. Higher consumer (residential user) cost for these transfer switches will be a taxable equate to an overall reduction in the number of these installed. Fewer installed switches mean more back-feed problems, and this simply exacerbates safety issues the proposal is attempting to eliminate.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-10.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 2
Gustafson, R.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-11.

13-18 Log #1090 NEC-P13 Final Action: Reject (445.20)

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 13-11
Recommendation: Revise the panel action text as follows:
Ground-Fault Circuit Interrupter Protection for Receptacles on Portable Generators. All 120 and 120/240 volt, single-phase, 15- and 20- and 30-ampere receptacle outlets that are a part of a portable generator shall have listed ground-fault circuit interrupter protection for personnel.
Substantiation: Although I would agree in general that having GFCI protection on all receptacles is a positive approach, the addition on the 30 ampere receptacles creates a significant concern in many applications of portable generators.
As the panel is aware, the application of portable generators as an optional power source for electrical systems has become very popular. The typical application is to install a transfer switch to allow for transfer between the utility and generator power sources. This panel is fed from a flanged inlet that is then cord connected to the portable generator. There are thousands of these installations in place with 30 ampere connections. If GFCI protection is provided on the 30A receptacle on the generator, the system will not work because the GFCI will trip. The technical reason for this is because none of these installations have the neutral switched and the GFCI detects the grounded neutral at the service.
If the panel moves forward with the requirement, as soon as a new generator is purchased, it renders these existing installations useless. This will lead the user to find a way to bypass the GFCI protection so that the generator will work with their installation. The panel should drop the 30 ampere provision to allow the generator to continue to serve in the optional stand-by applications. The provision for 15 and 20 ampere receptacles can continue since very few of these generators are connected at 20A or less.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-10.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 11 Negative: 3
Gustafson, R.
Explanation of Negative: FLACH, G.: See my explanation of negative vote on Comment 13-10. GFCI protection should not be required on 30-ampere, 125- and 250 volt receptacles. NASBY, J.: NEMA disagrees with Panel Action. The Comment should have been accepted. The submitter is correct that when the generator is used as an alternate power source in accordance with Article 702, the GFCI will not function properly on systems where the neutral is not switched. The vast majority of residential stand by systems do not have the neutral switched at
the transfer equipment. For construction site applications, Article 590 already provides requirements for protection of the 30 amperes circuits.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-11.

Comment on Affirmative:

GALLO, E.: This comment should be accepted for reasons stated by the submitter.

13-19 Log #1864 NEC-P13 Final Action: Reject
(445.20 (New) )

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 13-11

Recommendation: Add text to read as follows: Exception: In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified personnel are involved, portable generators without GFCI receptacles may be applied when serving loads whose loss are judged by the Authority Having Jurisdiction to have safety consequences.

Substantiation: The proposal ignores industrial applications of portable generators in which loss of power can have safety consequences. Examples might include: refrigeration compressors for cryogenic storage of flammable materials, flood lighting for workers on elevated structures, magnetically held cutting/welding tools or ventilation/pressurization for enclosures in a hazardous location. The proposal could be supported if an exception is added as shown above.

Panel Meeting Action: Reject

Panel Statement: Portable generators should not be used where maintaining the power supply is essential to life safety.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 1

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See My Explanation of Negative on Comment 13-10.

ARTICLE 450 — TRANSFORMERS AND TRANSFORMER VAULTS

9-74 Log #63 NEC-P09 Final Action: Accept
(450.5)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 9-134

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 5-119 since this proposal changed 250.32(B)(2) into an exception. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: This Comment correlates with CMP-5 action on Comment 5-58.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-75 Log #1342 NEC-P09 Final Action: Accept
(450.5(B) and (C))

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 9-18

Recommendation: Accept CMP-9’s Panel action reference item 7 on 450.5(B) and (C) in Proposal 9-18.

Substantiation: The NEC TCC Task Group on Grounding and Bonding agrees with CMP-9 that “grounding autotransformer” is the proper reference as used throughout 450.5 in the 2005 NEC.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Bokseriner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-76 Log #821 NEC-P09 Final Action: Reject
(450.15 (New) )

Submitter: Rod Belisle, NECA-IBEW Electrical Training Center

Comment on Proposal No: 9-142

Recommendation: “Accept in principle” with the addition of the following: The provisions for locking shall remain in place with or without the lock installed.

Substantiation: This proposal should have been “accept in principle” with the addition of the following: “The provisions for locking shall remain in place with or without the lock installed.”

See my previous comments for a negative vote in the ROP on this proposal.

Panel Meeting Action: Reject

Panel Statement: CMP 9 reaffirms its panel statement on this subject. The statement applies whether or not the locking arrangements are permanent.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

BELISLE, R.: The addition of an insight disconnect at the transformer provides an additional level of safety that would benefit workers providing maintenance and installation. Lock out and safety of energized equipment should always be considered when workers are required to work on the associated equipment.

SZENDRE, M.: I agree that insight disconnecting means should be required, and if not insight a means provided for locking. Safety of electrical workers cannot be ignored and with increased fault currents and FR clothing requirements, this issue will not go away.

9-77 Log #721 NEC-P09 Final Action: Accept
(450.20(A))

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 9-143

Recommendation: Continue to Reject

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 9 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFE and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Accept

Panel Statement: The Panel does not necessarily agree with all the substantiation provided by the submitter of this Comment.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

SZENDRE, M.: While I understand the submitter’s comment on limiting fine print notes, I disagree that they are a compilation of generic information that provides no information to the users. These manuals are well written and provide valuable information to the users.

9-78 Log #862 NEC-P09 Final Action: Accept
(450.20(A))

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 9-143

Recommendation: Continue to Reject

Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.

2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.

3. These standards are also covered by a Fine Print Note in 110.12.4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).

6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

**Panel Meeting Action:** Accept

**Panel Statement:** The Panel does not necessarily agree with all the substantiation provided by the submitter of this Comment.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

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**9-79 Log #720 NEC-P09**  
**Final Action:** Accept  
**(450.20(B))**

**Submitter:** Robert Kelleher, Paramount Electrical Services

**Comment on Proposal No:** 9-144

**Recommendation:** Continue to Reject

**Substantiation:** Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP 9 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBW, IAE, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYFBU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with the instructions for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

**Panel Meeting Action:** Accept

**Panel Statement:** The Panel does not necessarily agree with all the substantiation provided by the submitter of this Comment.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

**Comment on Affirmative:**

SZENDRE, M.: See my explanation of affirmative vote on Comment 9-77.

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**9-80 Log #863 NEC-P09**  
**Final Action:** Accept  
**(450.20(B))**

**Submitter:** John P. Masarick, Independent Electrical Contractors Inc.

**Comment on Proposal No:** 9-144

**Recommendation:** The panel is encouraged to continue to Reject Proposal 9-144.

**Substantiation:** The reasons to continue to Reject the Proposal are as follows:

1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.

2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.

3. These standards are also covered by a Fine Print Note in 110.12.

4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.

5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).

6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

**Panel Meeting Action:** Accept

**Panel Statement:** The Panel does not necessarily agree with all the substantiation provided by the submitter of this Comment.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

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**13-20 Log #2183 NEC-P13**  
**Final Action:** Reject  
**(455.7(C))**

**Submitter:** Patrick Gaffney, Ronk Electrical Industries, Inc.

**Comment on Proposal No:** 13-13

**Recommendation:** 455.7 covrs the overcurrent protection for the input side of the phase converter, not the output side. If a short circuit occurs in the input section of the converter, or wiring from overcurrent protection to the input, the only limiting factor is source impedance. Therefore, accept text as proposed in Proposal 13-13 for those cases where a power loss hazard exists, which by the way, are very rare instances. Current 125 percent or next standard size limit is too restrictive for equipment which must operate for safety and may be operating at loads exceeding rated full load of the motor operating the device. Substantiation: The panel statement speaks of phase converter supplying short circuit current, Section 455.7 covers phase converter input overcurrent protection only. Output overcurrent is covered by Articles for the type of equipment being operated (Article 430 for motor loads, for example). 240.4(A) allows equipment to be protected for short circuit only when power loss hazardous exist if overcurrent protection is based on typical overload sizing. If nothing else, there certainly needs to be something that allows more than the existing 125 percent or next standard size limit that now exists, when loads that must operate are involved, say 300-1000 percent at minimum.

**Panel Meeting Action:** Reject

**Panel Statement:** This comment does not comply with Section 4.4.5 (c) of the NFPA Regulations Governing Committee Projects in that it does not provide text of the comment, including the wording to be added, revised (and how revised), or deleted.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 13

**Ballot Not Returned:** 1 Gustafson, R.

**ARTICLE 480 STORAGE BATTERIES**

**13-21 Log #1421 NEC-P13**  
**Final Action:** Accept in Principle  
**(480.5 (New))**

**Submitter:** Vince Baclawski, National Electrical Manufacturers Association (NEMA)

**Comment on Proposal No:** 13-16

**Recommendation:** NEMA disagrees with the panel action. NEMA recommends that Proposal 13-16 be Accepted as written.

**Substantiation:** 480.5 (new) Disconnecting Means. A disconnecting means shall be provided for all ungrounded conductors derived from a stationary battery system. A disconnecting means shall be readily accessible and located within sight of the battery system.

**Panel Meeting Action:** Continue to Reject

**Panel Statement:** The panel action on Proposal 13-16 should be Rejected for the following reasons:

- From an infrastructure standpoint of using and maintaining a safe battery system, battery systems require maintenance. The purpose of this proposal is to provide a safe and standardized method to perform routine battery maintenance. Mr. Nasby’s, Mr. Stafford’s and Mr. Swayne’s negative panel comments clearly describe the potential hazards to not having a disconnecting means readily accessible and located within sight of the battery system.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 11 Negative: 3

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: This comment as modified by the panel should be rejected. No substantial basis was provided for the 30 Volt threshold, nor was any amp-hour minimum or basis provided for the disconnect requirement.

GALLO, E.: This comment should be rejected for the following reasons:

1. The practical effect of the language accepted by the panel is only to create confusion. According to the definition in Article 100, Disconnecting Means is a device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply. Therefore, if CMP 13 confirmed by acceptance of Comment 13-37, disconnecting means can be bolted connections or terminals and do not necessarily have to be switches or circuit breakers. Since installation of storage batteries typically already have voltaged connections at their terminals, this language is redundant and the effect of this proposal will only be to create confusion among users of the NEC.

2. The rationale for having a disconnecting means for storage batteries is flawed. The panel seems to be concerned with the possibility of arcing during the disconnection.

   a) Typically, battery maintenance is not done while batteries are charging or discharging, but while the batteries are on float. In this condition, the float current is tiny and the hydrogen evolution is minimal.

   b) Building codes require adequate ventilation of battery rooms to prevent the accumulation of an explosive mixture. In addition, modern battery chargers are typically designed to prevent situations that lead to excessive hydrogen evolution, such as overcharging or reverse charging.
ARTICLE 490 EQUIPMENT, OVER 600 VOLS, NOMINAL
9-81 Log #1836 NEC-P09 Final Action: Reject (490.21(A)(4)(2))
TCC Action: The Technical Correlating Committee directs that this comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 9-152
Recommendation: The panel should have voted to Accept this Proposal.
Substantiation: The proposal as written recognizes a system that provides reliable power to loads in large manufacturing plants. These secondary selective systems are common in double ended substations where maintaining power to loads is critical for operation or system safety in continuous manufacturing facilities and generating stations. These systems utilize automated logic that parallesls sources only momentarily and prohibits continuous paralleling. IEEE 666, “Design Guide for Electric Power Service Systems for Generating Stations” specifically allows this arrangement. Transformer impedances required to allow continuous paralleling would limit the ability to start very large motors in these facilities when operating on a single source. Also, the probability of a fault during the very brief time when both sources are connected in parallel is very low.
Panel Meeting Action: Accept in Principle
Final Action: Accept (490.46)
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Explanation of Negative:
Submitter: Charles Ball, S & C Electric Company
Comment on Proposal No: 9-158
Substantiation: Most utilities have their own design requirements for customer-owned switchgear that is connected to their system. These requirements are based on decades of experience and typically apply to incoming and metering sections. Proposal 9-158 contains design requirements for the incoming section of metal-clad or metal-enclosed switchgear applied as high-voltage service equipment. While these requirements are based on those of one utility, not all utilities have the same requirements. When there is a conflict, the utility will continue to insist that their requirements be met if the power user wants service. The power user will be in a catch 22 between utility requirements and NEC requirements.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Submitter: Brad Gruenewald, We Energies
Comment on Proposal No: 9-158
Substantiation: As an electric utility, We Energies has design requirements for customer-owned medium-voltage switchgear, which is connected to our electrical system. These design requirements have been developed with decades of experience. Our design requirements for medium-voltage switchgear (either metal-clad or metal-enclosed) require separate incoming (termination) and metering bay sections. Typically the termination compartment and isolating switch are contained in the same compartment. This compartment is exclusively under utility control. Our utility personnel are fully qualified to perform switching, testing and phasing operations. This Proposal 9-158 to the 2008 National Electrical Code (NEC) contains design requirements for the termination section of medium-voltage switchgear when applied as service equipment which is in direct conflict with our design requirements.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 9-18
Recommendation: Accept CMP-9’s Panel action reference items 10, 11, and 12 on 490.37, 490.55, and 490.72(D) in Proposal 9-18.
Substantiation: This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Dalep Mohla; Philip Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
9-85 Log #916 NEC-P09 Final Action: Accept (490.46)

Submitter: George House, Yaskawa Electric America, Inc.

Comment on Proposal No: 9-158

Substantiation: It would appear unwise to make such a widespread amendment based on the requirements of one utility since not all utilities have the same requirements. In such a conflict it will be the “user” of such equipment caught between the requirements of the electric utility and the NEC requirements. Why must NEC amend and enforce new design requirements that utilities have (for many years) provided for to incoming and metering sections of metal-clad and metal-enclosed switchgear? This amendment will have serious repercussions for customers desiring NEC approval and meeting the demands of the electric utilities’ requirements.

Please strike completely.

Panel Meeting Action: Accept
Panel Statement: The Panel does not necessarily agree with all the substantiation provided by the submitter of this Comment.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
FOGARTY, R.: Proposal 9-158 should not have been rejected. The requirements were reviewed and affirmed by the member utilities of the Edison Electrical Institute which represents the consensus of the utility industry through EEI and not just of one utility.
HARTWELL, F.: Please refer to my Explanation of Negative vote on Comment 9-91.
MCCULLOUGH, R.: See my explanation of negative vote on Comment 9-91.

9-86 Log #1451 NEC-P09 Final Action: Accept (490.46)

Submitter: Robert Molde, Xcel Energy

Comment on Proposal No: 9-158

Substantiation: The design requirements included in Proposal 9-158 are too limiting. Utilities typically have specific requirements for customer-owned switchgear connected to their system. Not all utilities have the same requirements. Contrary to Proposal 9-158 our utility presently specifies the service conductors and an isolating switch in the same compartment and the metering equipment is required to be in an adjacent separate metering compartment. Although there is a footnote in Proposal 9-158 stating the utility may have additional requirements, conflicts with customers will occur when the mandatory requirements of the utility differ from the NEC rule.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
FOGARTY, R.: Proposal 9-158 should not have been rejected. The requirements were reviewed and affirmed by the member utilities of the Edison Electrical Institute which represents the consensus of the utility industry through EEI and not just of one utility.
HARTWELL, F.: Please refer to my Explanation of Negative vote on Comment 9-91.
MCCULLOUGH, R.: See my explanation of negative vote on Comment 9-91.

9-87 Log #1825 NEC-P09 Final Action: Reject (490.46)

Submitter: Jerry Baskin, Federal Pacific

Comment on Proposal No: 9-158
Recommendation: Omit (delete) the entire proposed Section 490.46 Metal Enclosed and Metalclad Service Equipment.

Substantiation: This proposed section develops specific design criteria for metal-enclosed switchgear. (1) The NEC is not be design oriented, (2) There is no particular safety advantage in arranging the switchgear in the described fashion (i.e., there is the same exposure to high voltage), (3) The developed design precludes other configurations of metal-enclosed and metalclad switchgear that have been used successfully for decades, (4) The developed design precludes the use of certain other classes of equipment such as wall-mounted switches and pad-mounted switchgear that have been used successfully for decades as high-voltage service equipment and (5) The developed design is known to be presently used only in a small area of the United States and only by one organization.

Panel Meeting Action: Reject
Panel Statement: There is no substantiation to delete the entire existing section 490.46, as well as the proposed text. See panel action and statement on Proposal 9-88 Log #1838 NEC-P09 Final Action: Accept in Principle (490.46)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 9-158
Recommendation: This proposal should have been rejected by the Panel.

Substantiation: The panel should have voted to reject this proposal. The submitter provided no substantiation as to the safety benefits to be added by these new requirements over existing practices. These are design specifications.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 9-83.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
FOGARTY, R.: Proposal 9-158 should not have been rejected, Consistency in equipment is of benefit for safety where contractors work on equipment connecting to different utilities.
HARTWELL, F.: Please refer to my Explanation of Negative vote on Comment 9-91.
MCCULLOUGH, R.: See my explanation of negative vote on Comment 9-91.

9-89 Log #2173 NEC-P09 Final Action: Accept (490.46)

Submitter: Daniel Wycklendi, Copper Power Systems

Comment on Proposal No: 9-158

Substantiation: Most utilities have their own design requirements for customer-owned switchgear that is connected to their system. These requirements are based on decades of experience and typically apply to incoming and metering sections. Proposal 9-158 contains design requirements for the incoming section of metal-clad or metal-enclosed switchgear applied as high-voltage service equipment. While these requirements are based on those of one utility, not all utilities have the same requirements. When there is a conflict, the utility will continue to insist that their requirements be met if the power user wants service. The power user will be in a catch 22 between utility requirements and NEC requirements.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:
FOGARTY, R.: Proposal 9-158 should not have been rejected. The requirements were reviewed and affirmed by the member utilities of the Edison Electrical Institute which represents the consensus of the utility industry through EEI and not just of one utility.
HARTWELL, F.: Please refer to my Explanation of Negative vote on Comment 9-91.
MCCULLOUGH, R.: See my explanation of negative vote on Comment 9-91.

9-90 Log #2232 NEC-P09 Final Action: Accept (490.46)(1)

Submitter: Anne Morgan, Pepco

Comment on Proposal No: 9-158

Substantiation: The proposed wording contains design requirements, but little that addresses safety. Our design requirements for primary customers have been in place for decades and used successfully for both the customer and our electric system. We require MC switchgear with drawout breakers, glow tubes, voltage transformers as well as the equipment listed. For special installations we need to be able to design to the need and not be limited to the devices listed in the NEC. We also require a ground and test device for testing and phasing. Isolating switches and ground bails would not be allowed in the MC switchgear connecting to our system. I am not sure from the wording that the difference between MC and ME switchgear is understood. The proposed wording addresses design and goes well beyond the stated purpose of the NEC. It leaves our customers with the difficult choice of designing to our requirements or the NEC requirements.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
ARTICLE 500 HAZARDOUS (CLASSIFIED) LOCATIONS, CLASS I, II, AND III, DIVISIONS 1 AND 2

14-1 Log #116 NEC-P14 Final Action: Accept in Part
(500.6(A)), FPN 3

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-14

Recommendation: The Technical Correlating Committee directs the panel to reconsider the action on this proposal and include the Fahrenheit temperature in order to maintain consistency with the balance of the code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

The panel is accepting the TCC direction to reconsider. But the panel is not changing the action on Proposal 14-14

Panel Statement: The panel is not changing the action on Proposal 14-14 because:
- Degrees Celsius is the industry standard for this application.
- The panel wishes to maintain consistency with Table 4.4.2 of NFPA 497, which reports data in degrees Celsius.

Note to the TCC: Assuming this comment remains rejected, this submitter’s Comment 9-158 should not have been rejected. The requirements were reviewed and affirmed by the member utilities of the Edison Electric Institute which represents the consensus of the utility through EEI and not just of one utility.

Panel Meeting Action: Reject

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-2 Log #636 NEC-P14 Final Action: Reject
(500.7(K))

Submitter: Eliana Beattie, ISA

Comment on Proposal No: 14-15

Recommendation: The panel statement indicates that the referenced standard contained in the recommendation is not currently published. The referenced standard will be published and publicly available prior to the ROC meeting.

Substantiation: The standard referenced, ISA TR12.13.03 will be published prior to the ROC meeting.

Panel Meeting Action: Reject

Panel Statement: This particular standard has not been published and, therefore, cannot be referenced.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-3 Log #2026 NEC-P14 Final Action: Reject
(500.7(K)), FPN 1

Submitter: Patrick J. Byrne, FM Approvals, LLC

Comment on Proposal No: 14-18

Recommendation: Revise as follows:
- FN0 No. 1: For further information, see ANSI/ISA-12.13.01, Performance Requirements, Combustible Gas Detectors, and ANSI/UL 2075, Gas and Vapor Detectors and Sensors.

Substantiation: There are three main technical reasons to show that a gas detector listed to ANSI/UL 2075 not only contradicts the requirements of ANSI/ISA 12.13.01 it also contradicts the requirements of this article within the NEC. ANSI/UL 2075 does not mandate acceptance to ANSI/ISA 12.13.01 section 15.1 it requires compliance to ANSI/ISA 12.13.01 or UL 284. The section 15.1 c) which references ANSI/ISA 12.13.01 violates two main requirements in ANSI/ISA 12.13.01, it allows both the measurement and the alarm levels to exceed 100% LEL. ANSI/ISA 12.13.01 limits the measurement to 100% LEL and limits Alarm levels not to exceed 60 percent LEL. Section 9.4.1 states “Removal of a snap on cover to gain access to the sensitivity control is permissible only when no hazardous voltage parts are able to be contacted by the user. By not requiring a too secured cover or password protection to the adjustments, this requirement contradicts the first sentence of 500.7 K) “... where the conditions of maintenance and supervision ensure that only qualified persons service the installation.” Section 2.7.2 of ANSI/ISA 12.13.01 states a special tool is required to gain access to, or to adjust, controls. The design of the tool is intended to discourage unauthorized interference with the apparatus.

The use of this standard is not common practice by the gas detection community in fact the standard, in its current format, has been rejected by the gas detection community. Three of the most predominate nationally recognized testing laboratories (NRTL) that list gas detection equipment for the detection of combustible gas detectors are FM Approvals. CSA International and UL.
As a representative of FM approvals, I can state that it is FM approvals policy to use our FM 6310.6320 and ANSI/ISA 12.13.01 to certify a combustible gas detector. I have provided documents taken from both CSA International and the UL website which identifies the requirements for having a gas detector listed for performance both documents state ISA 12.13, as the performance requirement and neither identify ANSI/UL 2075 as a required standard. Furthermore, there are only six manufacturers that have any gas detection equipment listed by these three NRTLs to ANSI/UL 2075. Of the six certifications, only two are certified as a combustible gas detector that can be used in this application. Both are certified to ISA I2.13 but neither are certified to the current edition of ANSI/UL 2075. I have discussed this standard with manufacturers including one of the UL listed manufacturers, and they have no intention to use this standard for a number of reasons. One of the main technical reasons is one test requires the exclusion of dust. This test will exclude one the of the most common types of technology used, catalytic sensors. A catalytic sensor requires an explosionproof protection method. A sintered metal disk is used to protect the sensor which acts as a flame arrester, during this dust test the sintered disk would clog resulting in a failure. Based on the extremely limited use of the standard, the contradiction between the ANSI/UL 2075 with the National Electrical Code and ANSI/ISA 12.13.01 and that the testing will exclude one of the most common types of technology in use today please reconsider the addition of this standard.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: UL 2075 references ISA 12.13.01 for performance requirements. It also includes requirements for reliability of circuitry and components. The panel notes that the substantiation statement references a UL document (UL 284) that does not exist.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Comment on Affirmative: LAWRENCE, JR., W.: The submitter notes that a typographical error was made in the submitted comment. The correct reference is UL 2848, not the UL284 as was shown in the comment.

ARTICLE 501 CLASS I LOCATIONS

14-4 Log #1254 NEC-P14 Final Action: Accept (501, 502, 503, 505, 506, and 511)

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 14-22

Recommendation: Continue to accept the following portions of the TCC Grounding and Bonding Task Group proposal 14-22 as modified and revised by the actions of SMP-14: 501.10(A)(1)(i) (d), 501.10(B)(2)(d), 501.15(A)(4)

Recommendation: Exception: Type PVC Conduits and Type RTRC Conduit, Require nonmetallic conduit complying with Article 352 shall be permitted where encased.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel action on Comment 14-7.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-7 Log #356 NEC-P14 Final Action: Accept (501.10(A)(1) Exception)

Submitter: Code-Making Panel 8, Comment on Proposal No: 14-27

Recommendation: CMP-8 recommends that CMP-14 accept this proposal in principle with the revised text: references in these fine print notes is to improve the usability of the Code.

Substantiation: This comment has been balloted through CMP-8 with the following ballot results:

12 Eligible to Vote
11 Affirmative
1 Negative

Mr. R. Loyd voted negatively stating: “Proposal 14-27 was to Reject. No comment necessary, CMP-8 has no substantiation for recommending that CMP-14 reverse their action. Note: UL does not recognize any RTRC nonmetallic conduit as comparable to schedule 80 Pvc which is suitable for use where subject to physical damage.

Panel Meeting Action: Accept

Panel Statement: Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-8 Log #548 NEC-P14 Final Action: Accept in Principle (501.10(B)(1)(7))

“TCC Action: The Technical Correlating Committee notes that the purpose of establishing Annex A was to eliminate the need to have FPNS throughout the code that reference the product standards. There is no basis for the Chapter 5 articles to be treated differently.

The Technical Correlating Committee further directs that the title for UL 2225 in Annex A be revised from “Metal-Clad Cables and Cable-Sealing Fittings for Use in Hazardous (Classified) Locations” to “Cables and Cable Fittings for Use in Hazardous (Classified) Locations” to be consistent with the title of the chapter standard.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-26

Recommendation: The Technical Correlating Committee directs that the panel reconsider the action on this proposal. The request for a product standard Annex A of the NEC was specifically added to handle these types of references. The panel should delete the new FPNS and add a reference to UL 2225 into Annex A. This will make the text consistent with how standards for listing are treated elsewhere in the code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

The panel has accepted the direction of the TCC to reconsider the issue and agrees that the reference should also be in Annex A. However, it is the position of the panel that it is essential to retain the fine print notes and references for the benefit of users of this particular part of the Code.

Panel Statement: To help ensure safe application and installation of the equipment. This is additional information to lead the user to a specific reference document. The panel points out that the purpose of the standard references in these fine print notes is to improve the usability of the Code.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14
In industrial establishments with restricted public access where the conditions of maintenance and supervision ensure that only qualified persons service the installation and where metallic conduit does not provide sufficient corrosion resistance, Reinforced Thermosetting Resin Conduit (RTRC) factory elbows, and associated fittings, all marked with suffix -XW, in accordance with 355.6, and Schedule 80 PVC Conduit, factory elbows and associated fittings, in accordance with 352.6 shall be permitted. Where seals are required for boundary conditions as defined in 501.15(A)(4), the Division 1 wiring method shall extend into the Division 2 area to the seal, which shall be located on the Division 2 side of the Division 1 – Division 2 boundary. Add a fine print note to 501.10(B)(1)(7) to read: FPN: For additional information on RTRC-XW, see ANSI/UL 1684A, Supplemental Requirements for Extra-Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings. Also, add ANSI/UL 1684A, Supplemental Requirements for Extra-Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings, to Annex A.

Panel Statement: The panel has moved the reference to “XW” marking to clarify that it applies to the elbows and fittings as well as the conduit itself. The references to 352.6 and 355.6 are deleted because they are covered in 90.3. A fine print note has been added to provide a correlation between RTRC-XW and the specific product standard. A reference has been added to Annex A to the appropriate product standard. See also panel action on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-9 Log #798 NEC-P14 Final Action: Rejected (501.10(B)(1)(7))

Submitter: Richard E. Loyd, Sun Lakes, AZ

Comment on Proposal No: 14-33a

Recommendation: Do not change the existing text. Please Reject this Proposal.

Substantiation: There is no substantiation provided that Reinforced Thermosetting Resin Conduit (RTRC) or Schedule 80 PVC will adequately stand up to and safely contain all of the hazards of hazardous liquids, vapors, or gases likely to be present at sometime during the life of the installation. PVC is not recommended for use where subject to petroleum based products. Although explosions are not likely to occur in a Class I Division 2 location they do and no testing has been done on these products to verify they will withstand pressure piling or contain an explosion. Also, the solvent attached couplings will not allow the gases to escape slowly to allow them to cool to a safe level. Static is another source of ignition that has not been examined when the raceways are nonmetallic. The proposed language would permit limited use of nonmetallic raceways where metal raceway does not provide sufficient corrosion protection. The corrosion performance of the PVC coated rigid metal conduit and the rigid PVC conduit is virtually identical. However, the PVC coated rigid metal conduit provides increased physical strength and electric conductive performance. PVC coated rigid metal conduit provides superior sun light resistance protection and its characteristics do not change when exposed to extreme hot or cold environments.

The 2006 UL White book states that RTRC 40 and RTRC 80 are not suitable for use where subject to physical damage. There are many more valid reasons why this proposal should not be accepted, even the prevention of one loss or life accident is reason enough to reject the proposal.

Panel Meeting Action: Rejected

Panel Statement: The concerns raised by the submitter were previously addressed in the substantiation to Proposal 14-33a, and the panel concludes that the substantiation continues to be valid. Additionally, RTRC-XW has been specified to address risks subject to physical abuse. In Division 2 locations, raceway systems are not required to contain an explosion.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative: BE00EN. Mr. Loyd agrees with the Panel’s action to “reject” and I am voting negative for the following reasons:

There is no substantiation that Reinforced Thermosetting Resin Conduit (RTRC) or Schedule 80 PVC will be adequate as a wiring method in a hazardous location. I would first question the lack of testing and evaluation, especially the ability of the attached fittings and solvent to allow the gas to cool and escape slowly. Where metal raceways do not permit sufficient corrosion protection, PVC coated rigid metal conduit will provide the physical protection as well as corrosion protection.

The 2006 UL White book clearly states that RTRC 40 and 80 are not suitable for use where subject to physical damage. I don’t believe that RTRC or PVC schedule 80 should be permitted to be installed in hazardous locations without further evaluation.
The proposed revision addresses the Technical Correlating Committee’s comment regarding redundant references. The referenced section for RTRC was changed from 355.6 to 355.12(C), which addresses the requirement that conduit used in areas where subject to physical damage shall be identified for the use. A reference to 352.12(C) is not needed as Schedule 80 PVC Conduit is listed and identified for use in areas where subject to physical damage. A FPN was added to show the correct identification for RTRC currently acceptable for use in locations where subject to Physical Damage.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** The commenter’s concerns have been addressed by the panel action on Comment 14-8.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 13 Negative: 1

**Explanation of Negative:**


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**Submitter:** William Wagner, Certification Solutions

**Comment on Proposal No:** 14-33a

**Recommendation:** This Proposal should continue to be Accepted with the following revision to the proposed text:

In industrial establishments with restricted public access where the conditions of maintenance and supervision ensure that only qualified persons service the installation and where metallic conduit does not provide sufficient corrosion resistance, Reinforced Thermosetting Resin Conduit (RTRC), factory elbows, and associated fittings identified for use in areas subject to physical damage in accordance with 355.12(C), and Schedule 80 PVC Conduit, factory elbows, and associated fittings identified in accordance with 352.12(C) shall be permitted. Where seals are required for boundary conditions as defined in 501.15(A)(4), the Division 1 wiring method shall extend into the Division 2 area to the explosionproof seal which shall be located on the division 2 side of the Division 1 - Division 2 boundary.

**FPN:** Type XW RTRC is identified for use in areas where subject to physical damage.

**Substantiation:** The proposed revision addresses the Technical Correlating Committee’s comment regarding redundant references. The referenced section for RTRC was changed from 355.6 to 355.12(C), which addresses the requirement that conduit used in areas where subject to physical damage shall be identified for the use. A reference to 352.12(C) is not needed as Schedule 80 PVC Conduit is listed and identified for use in areas where subject to physical damage. A FPN was added to show the correct identification for RTRC currently acceptable for use in locations where subject to Physical Damage.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** The commenter’s concerns have been addressed by the panel action on Comment 14-8.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 13 Negative: 1

**Explanation of Negative:**


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**Submitter:** Michael Walls, American Chemistry Council

**Comment on Proposal No:** 14-30

**Recommendation:** Add text to read as follows:

The American Chemistry Council supports CMP 14 action on 14-30 and 14-33a dealing with the permitted use of non metallic conduit as addressed in Articles 352 for Rigid Nonmetallic Polyvinyl Chloride Conduit and Article 355 for Reinforced Thermosetting Resin Conduit in Hazardous Classified locations. Also as appropriate in the Article 500 series, the term “PVC” Conduit should be revised to “Rigid Nonmetallic Polyvinyl Chloride” Conduit: Type PVC RNC, as for example in 501.10(B)(1)(7).

**Substantiation:** See the affirmative balloting comments on this proposal 14-30.

**Panel Meeting Action:** Reject

**Panel Statement:** The nomenclature for this product is the responsibility of CMP-9.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 14

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**Submitter:** David H. Kendall, Carlon

**Comment on Proposal No:** 14-33a

**Recommendation:** This Proposal should continue to be Accepted with the following revision to the proposed text:

In industrial establishments with restricted public access where the conditions of maintenance and supervision ensure that only qualified persons service the installation and where metallic conduit does not provide sufficient corrosion resistance, Reinforced Thermosetting Resin Conduit (RTRC) identified as XW, factory elbows, and associated fittings in accordance with 355.8, and Schedule 80 PVC Conduit, factory elbows, and associated fittings in accordance with 352.12(C), shall be permitted. Where seals are required for boundary conditions as defined in 501.15(A)(4), the Division 1 wiring method shall extend into the Division 2 area to the explosionproof seal which shall be located on the Division 2 side of the Division 1 - Division 2 boundary.

**Substantiation:** The proposed revision addresses the Technical Correlating Committee’s comment regarding redundant references. The referenced sections were deleted since both RTRC-XW and Schedule 80 conduits are both listed and identified for areas of physical damage.

In addition, RTRC-XW was added since RTRC is required to be identified for areas of physical damage. This requirement is the same for the Schedule 80 PVC conduit and ensures additional protection of the wiring method.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** The commenter’s concerns have been addressed by the panel action on Comment 14-8.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 13 Negative: 1

**Explanation of Negative:**

14-16. The Technical Correlating Committee notes that the purpose of establishing Annex A was to eliminate the need to have FPNs throughout the code that reference the product standards. There is no basis for the Chapter 5 articles to be treated differently.

The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-35
Recommendation: The Technical Correlating Committee directs the panel to reconsider the action on this proposal and relocate the product standards references to Annex A. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the NEC. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part
Panel Statement: See panel action on Comment 14-5
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-17 Log #12 NEC-P14 (501.15(F)(3))
Final Action: Accept in Part

TCC Action: The Technical Correlating Committee directs that last FPN 501.15(F)(3) be deleted in accordance with the direction given to the panel in Comment 14-17.

In addition, add the following reference to Annex A:

“Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids - ANSI/ISA-12.75-1991”

The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-39
Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and to relocate the reference into Annex A to be consistent with other parts of the Code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-18 Log #12 NEC-P14 (501.30(A) Exception)
Final Action: Accept in Part

TCC Action: The Technical Correlating Committee directs that the Exception to 501.30(A), be revised to read as follows:

“Exception: The specific bonding means shall be required only to the nearest point where the grounded circuit conductor and the grounding electrode are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B), provided the branch-circuit overcurrent protection is located on the load side of the disconnecting means.”

This action corrects the exception with the revised text of 250.32 as accepted by Code-Making Panel 5 in Comment 5-58.

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-43
Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part
Panel Statement: CMP-14 accepts the TCC direction to reconsider the action on Proposal 14-43. CMP-14 recognizes that CMP-5 audit that CMP-5 audit the application of the Exception to 501.30 (A). However, the text in the exception remains correct.

Panel Statement: The text continues to reference applicable requirements in 250.32 (A), (B), and (C). No additional action is required from CMP-14 for correlation.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-19 Log #123 NEC-P14 (501.35 and 502.35)
Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-45
Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-349. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: Accept the original action on Proposal 14-45. Not eligible to vote: 14

Ballot Results: Affirmative: 14

14-21 Log #2189 NEC-P14 (501.140(A)(3) (New))
Final Action: Reject

Submitter: Stephen V. Norako, EGS Electrical Group
Comment on Proposal No: 14-53
Recommendation: Add new text to read as follows:

“The raceway shall be sealed to minimize the gas or vapor in the well-pit from being communicated to the location of the power source. This seal shall not be required to be explosionproof.

Substantiation: These well pits are below grade and due to the accumulation of vapors and gases, typically classified Class I Division 1. The flexible cord is the wiring method. The submersible pump is listed Class I Division 1 (typically explosionproof). The pump comes with flexible cord factory installed and factory sealed (Class I Division 1 seal) where it makes connection to the pump. No additional explosionproof seal is needed. This “Suitable Raceway” is not the wiring method (the flexible cord is). The “Suitable Raceway” (typically RMC or RNMC) is there to protect the flexible code from physical damage and allow it to be run underground. This causes the confusion as the rule permits an open ended conduit. It is open ended conduit that can act as means to communicate gases into the adjacent area. The code panel statement on Proposal 14-53 does refer to the prescribed requirements for boundary seals however this does not alleviate the confusion. The requirements in Class I, Division 1 boundary seals in 501.15(A)(4) requires by “guidance” of the FPN No. 1 of 501.15 that this seal is to minimize the gases and vapors and prevent the passage of flames... So by the code panel referencing back to the requirements of boundary vent... it supersedes the intent of minimizing the amount of gas or vapor... which is prescribed for a Class I, Division 1 boundary seal in 501.15(A)(4). The way the current rules are written results in a cord going to a well pit that is not sealed to even minimize the migration of gases into the open conduit. It would be a safer requirement to require that a seal be provided, one in which can be retrofitted during cord replacement. The purpose of this seal would be to minimize the migration of gases and vapors into the open ended circuits.

The problem is that this is a subject of much confusion. Installations range from no seal being used to the enforcement of an explosionproof seal. A seal must be used but only to limit the passage of gases, but not to prevent the passage of flames. Although an explosionproof seal is a safe option, engineers are concerned with what happens when the pump needs to be removed for maintenance. This is normally performed by the mechanical trade. The explosionproof seal is ripped out and never replaced. Engineers and contractors have voiced the need for another type of seal such as a mechanical device that can be removed and reinstalled to better address the maintenance issue.

Panel Meeting Action: Reject
Panel Statement: The change in the wording from “wireway” to “raceway” does not preclude the requirements for sealing. Existing requirements for sealing in 501.15 already apply if an electrical raceway is used and is connected to an electrical apparatus.

Number Eligible to Vote: 14

14-22 Log #2222 NEC-P14 (501.140(A)(3))
Final Action: Reject

Submitter: Steven J. Blais, EGS Electrical Group
Comment on Proposal No: 14-53
Recommendation: Revise text to read as follows:

The raceways shall be sealed to minimize the gas or vapor in the well-pit from being communicated to the location of the power source. This seal shall not be required to be explosionproof.

Substantiation: These well pits are below grade and due to the accumulation of vapors and gases, typically classified Class I Division 1. The flexible cord is the wiring method. The submersible pump is listed Class I Division 1 (typically explosionproof). The pump comes with flexible cord factory installed and factory sealed (Class I Division 1 seal) where it makes connection to the pump. No additional explosionproof seal is needed. This “Suitable Raceway” is not the wiring method (the flexible cord is). The “Suitable Raceway” (typically RMC or RNMC) is there to protect the flexible code from physical damage and allow it to be run underground. This causes the confusion as the rule permits an open ended conduit. It is open ended conduit that can act as means to communicate gases into the adjacent area. The code panel statement on Proposal 14-53 does refer to the prescribed requirements for boundary seals however this does not alleviate the confusion. The requirements in Class I, Division 1 boundary seals in 501.15(A)(4) requires by “guidance” of the FPN No. 1 of 501.15 that this seal is to minimize the gases and vapors and prevent the passage of flames... So by the code panel referencing back to the requirements of boundary vent... it supersedes the intent of minimizing the amount of gas or vapor... which is prescribed for a Class I, Division 1 boundary seal in 501.15(A)(4). The way the current rules are written results in a cord going to a well pit that is not sealed to even minimize the migration of gases into the open conduit. It would be a safer requirement to require that a seal be provided, one in which can be retrofitted during cord replacement. The purpose of this seal would be to minimize the migration of gases and vapors into the open ended circuits.

The problem is that this is a subject of much confusion. Installations range from no seal being used to the enforcement of an explosionproof seal. A seal must be used but only to limit the passage of gases, but not to prevent the passage of flames. Although an explosionproof seal is a safe option, engineers are concerned with what happens when the pump needs to be removed for maintenance. This is normally performed by the mechanical trade. The explosionproof seal is ripped out and never replaced. Engineers and contractors have voiced the need for another type of seal such as a mechanical device that can be removed and reinstalled to better address the maintenance issue.

Panel Meeting Action: Reject
Panel Statement: See panel action on Comment 14-21.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14
14-20 Log #466 NEC-P14

Final Action: Reject

(501.140(B)(3))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 14-54

Recommendation: Accept as revised:
(3) Be connected to terminals in approved manner in accordance with 110.14 and 501.45. Alternatively, delete (3).

Substantiation: Proposal provides specificity. Panel statement that reference to 110.14 is not necessary because it already applies, also makes (3) unnecessary. The requirements of 110.14 and this section, worded differently, may cause confusion.

Panel Meeting Action: Reject

Panel Statement: The reference to 110.14 is not necessary because it applies throughout the Code. CMP-14 notes that the complete wording of 501.140(B)(3) was not shown.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

GOOK, D.: The submitter and the panel statement both clarify that nothing in 501.140 is the deletion of text within A(1). This text should not be deleted as this text defines criteria for other similar devices, not identified in the "types" identified and additionally there is no justification offered to support this specific change being proposed. In the second case for isolating switches containing no fuses and not installed where dusts of an electrically conductive nature are present, permits these identified types of devices to be installed in dust-tight like enclosures. This has been a historical practice which has yet to be shown unsafe. The comparison to 502.115 (B) is not correct as these are not the same types of devices and the likelihood of ignition is not the same (for example, fuses in (B) and not containing fuses in (A(2))). Additionally see the balloting comments for Mr. Walls.

Panel Meeting Action: Reject

Panel Statement: The current requirement permits a construction in Division 1, which would not be permitted by 502.115(B) in Division 2.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Explanation of Negative:


The action should have been to Accept in Principle, with the following revised text which follows the action taken on log 14-28:

502.115 Switches, Circuit Breakers, Motor Controllers, and Fuses.
(A) Class II, Division 1. In Class II, Division 1 locations, switches, circuit breakers, motor controllers, and fuses shall comply with 502.115(A)(1) through (A)(2).

(1) Type Required. Switches, circuit breakers, motor controllers, and fuses, including pushbuttons, relays, and similar devices that are intended to interrupt current during normal operation or that are installed where combustible dusts of an electrically conductive nature may be present, shall be provided with identified dust-ignitionproof enclosures.

(2) Isolating Switches. Disconnecting and isolating switches containing no fuses and not intended to interrupt current and not installed where dusts may be of an electrically conductive nature shall be provided either (a) with tight metal enclosures that shall be designed to minimize the entrance of dust or (b) with telescoping or close-fitting covers or other effective means to prevent the escape of sparks or burning material and (2) have no openings (such as holes for attachment screws) through which, after installation, sparks or burning material might escape or through which excessive accumulations of dust or adjacent combustible material might be ignited, or (b) in dusttight enclosures.

Effective January 1, 2011 only dusttight enclosures shall be permitted.

(3) Metal Ducts: In locations where dust from magnesium, aluminum, aluminum bronze powders, or other metals of similarly hazardous characteristics may be present, fuses, switches, motor controllers, and circuit breakers shall have enclosures identified for such locations.

Discussion

Comments 14-25 and 14-26:

During our Panel discussions of 502 and dusttight enclosures we seem to have lost sight of the significant importance that 502.115 (A)(2) provides to industry for personal safety and the basis for the rational for having defined (A) (1) and (A) (2) as was done many years ago with the current text.

There is a very important distinction made in 502.115 between (A) (1) which is addressing the normal equipment control; how the equipment is designed to be stopped and stopped during normal operations when such equipment is in a Class II, Division 1 location, and which is often frequent need to “isolate” for safety reasons rotating equipment which is addressed in (A) (2). I think we all understand normal start/stop controls and the appropriate design needed for use in a Class II, Division 1 location.

"Isolating switches" addressed in (A) (2) are not used for control, but rather they represent a very important additional level of protection which is often needed to allow operators to address problems within processing equipment due to blockage or obstruction or impediment of the process stream. Many Class II processes involve materials which may cake-up or form blockages within the process equipment. When this occurs prompt action must be taken to restore the process. Industry has recognized that the risk to the operator is often too great to merely depend on the standard on-off equipment switch to be used as a single safeguard to prevent the restart of rotating equipment especially when the operator may be exposed to rotating components, as is often the case when the need arises to remove the impediments to the process flow. The isolation switch as addressed in A(2) will be treated as an administrative control level of protection used in accordance with a administrative control. Typically the actions under this administrative control include, a determination that a blockage has occurred within the process; stopping of the process using the standard equipment controls, use of the isolation switches under a non-running/non load condition; verification that the isolation has been made, then opening the equipment as appropriate to correct the processing problem. Once the problem has been corrected, the equipment is restored to it closed operating condition, the isolation switch re-closed, the process rechecked, and then the process is restarted.

Again it is important to recognize that the isolation switch is not an operating switch. Thus a comparison to other switches used for control in a Division 1 or Division 2 location is not a valid comparison. By design and application there is no transfer of electrical energy under load when the isolation switch is used, as the mechanical equipment is off and at rest. Further it is most important that the isolation switch be locally visible and accessible to permit prompt resolution to the process impairment.

ARTICLE 502 CLASS II LOCATIONS

14-23 Log #124 NEC-P14

Final Action: Accept in Part

(502.10)

TCC Action: The Technical Correlating Committee directs that the FPN of 502.10(A)(3) be deleted in accordance with the direction given to the panel in Comment 14-23. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the Code.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-56

Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and to relocate the reference into Annex A to be consistent with other parts of the Code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

Panel Statement: See panel action on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-24 Log #125 NEC-P14

Final Action: Accept in Part

(502.30(A) Exception)

TCC Action: The Technical Correlating Committee directs that the Exception on 502.30(A), be revised to read as follows:

“Exception: The specific bonding means shall be required only to the nearest point where the grounded circuit conductor and the grounding electrode are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B), provided the branch-circuit overcurrent protection is located on the load side of the disconnecting means.”

This action correlates the exception with the revised text of 250.32 as accepted by Code-Making Panel 5 in Comment 5-58.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-62

Recommendation: It was the action of the Technical Correlating Committee that this proposal was considered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

Panel Statement: See panel action on Comment 14-18.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-25 Log #1871 NEC-P14

Final Action: Reject

(502.115)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 14-63

Recommendation: Retain the current text and reject the action taken on the proposal.

Substantiation: There are two conditions affected by this proposal. The first is the deletion of text within A(1). This text should not be deleted as this text defines criteria for other similar devices, not identified in the “types” identified and additionally there is no justification offered to support this specific change being proposed.
Industry needs to have these isolation switches and our Code panel needs to continue to recognize the significant safety purpose for having these isolation switches and for not treating them as general equipment controls.

Aside from the dusttight issue that was discussed the texts in (A) (1) and (A) (2) serve important design roles. These texts need to be retained. Eliminating the complete aspect addressed by Isolation Switches under (A) (2) would be a major disservice to industrial users and by implication could result in the possible application of using only a single means of control with life threatening potentials.

WIRFS, M. I agree that the original text did not need to be modified. However, Mr. Wechsler has suggested changing the panel action to Accept in Principle with additional changes that have not been fully debated by the panel members.

Since the original comments asked to REJECT the original action on Proposal 14-63 and to leave the existing text in the Code, I realize that a NEGATIVE vote on the panel action leaves the original comment as an unresolved response.

If the panel action to REJECT does not receive sufficient votes to pass, it would seem to the that another action cannot be undertaken at this time and the Technical Correlating Committee should hold the original proposal over for the next code cycle when appropriate actions and public review can be processed.

14-26 Log #574 NEC-P14 Final Action: Reject (502.115(A))

Submitter: William M. Lewis, Martinsville, IN

Comment on Proposal No: 14-63

Recommendation: The proposal should be rejected.

Substantiation: The submitter provided no technical justification nor record of safety issues resulting from the existing text.

Panel Meeting Action: Reject

Panel Statement: See panel action on Comment 14-25.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Explanation of Negative:

WECHSLER, D.: Comments 14-25 and 14-26

The action should have been to Accept in Principle, with the following revised text which follows the action taken on log 14-28: 502.115 Switches, Circuit Breakers, Motor Controllers, and Fuses.

(A) Class II, Division 1. In Class II, Division 1 locations, switches, circuit breakers, motor controllers, and fuses shall comply with 502.115(A)(1) through (A)(2).

(1) Type Required. Switches, circuit breakers, motor controllers, and fuses, including pushbuttons, relays, and similar devices that are intended to interrupt current during normal operation or that are installed where combustible dusts of an electrically conductive nature may be present, shall be provided with identified dust-insulation-proof enclosures.

(2) Isolating Switches. Disconnecting and isolating switches containing no fuses and not intended to interrupt current and not installed where dusts may be of an electrically conductive nature shall be provided either (a) with tight metal enclosures that shall be designed to minimize the entrance of dust and that shall (1) be equipped with telescoping or close-fitting covers or with other effective means to prevent the escape of sparks or burning material and (2) have no openings (such as holes for attachment screws) through which, after installation, sparks or burning material might escape or through which exterior accumulations of dust or adjacent combustible material might be ignited, or (b) in dusttight enclosures.

Effective January 1, 2011 only dusttight enclosures shall be permitted.

(3) Metal Dusts. In locations where dust from magnesium, aluminum, aluminum bronze powders, or other metals of similarly hazardous characteristics may be present, fuses, switches, motor controllers, and circuit breakers shall have enclosures identified for such locations.

Discussion

Comments 14-25 and 14-26:

During our panel discussions of 502 and dusttight enclosures we seem to have lost sight of the significant importance that 502.115 (A)(2) provides to industry for personal safety and the basis for the rational for having defined (A) (1) and (A) (2) as was done many years ago with the current texts.

There is a very important distinction made in 502.115 between (A) (1) which is addressing the normal equipment control, how the equipment is designed to be started and stopped during normal operations when such equipment is in a Class II, Division 1 location, and that which is often frequent need to “isolate” for safety reasons rotating equipment which is addressed in (A) (2). I think we all understand normal start/stop controls and the appropriate design needed for use in a Class II, Division 1 location.

“Isolating switches” addressed in (A) (2) are not used for control, but rather they represent a very important additional level of protection which is often needed to allow operators to address problems within processing equipment due to blockage or obstruction or impendiment of the process stream. Many Class II processes involve materials which may cake-up or form blockages within the process equipment. When this occurs prompt action must be taken to restore the process. Industry has recognized that the risk to the operator is often too great to merely depend on the standard on-off equipment switch to be used as a single safeguard to prevent the restart of rotating equipment especially when the operator may be exposed to rotating components, as is often the case when the need arises to remove the impediments to the process flow. The isolation switch as addressed in (A)(2) is treated as an additional protection level of protection used in accordance with a administrative control. Typically the actions under this administrative control include, a determination that a blockage has occurred within the process; stopping of the process using the standard equipment controls, use of the isolation switches under a non-running/non load condition; verification that the isolation has been made, then operating the equipment as appropriate to correct the processing problem. Once the problem has been corrected, the equipment is restored to its closed operating condition, the isolation switch re-closed, the process rechecked, and then the process is restarted.

Again, it is important to recognize that the isolation switch is not an operating switch and thus cannot be confused with other switches used for control in a Division 1 or Division 2 location is not a valid comparison. By design and application there is no transfer of electrical energy under load when the isolation switch is used, as the mechanical equipment is off and at rest. Further it is most important that the isolation switch be locally visible and accessible to permit prompt resolution to the process impairment.

Industry needs to have these isolation switches and our Code panel needs to continue to recognize the significant safety purpose for having these isolation switches and for not treating them as general equipment controls. Aside from the dusttight issue that was discussed the texts in (A) (1) and (A) (2) serve important design roles. These texts need to be retained. Eliminating the complete aspect addressed by Isolation Switches under (A) (2) would be a major disservice to industrial users and by implication could result in the possible application of using only a single means of control with life threatening potentials.

WIRFS, M.: See my explanation of negative vote on Comment 14-25.

14-27 Log #575 NEC-P14 Final Action: Reject (502.120(B))

Submitter: William M. Lewis, Martinsville, IN

Comment on Proposal No: 14-64

Recommendation: The proposal should be rejected.

Substantiation: The submitter provided no technical justification nor record of safety issues resulting from the existing text.

Panel Meeting Action: Reject

Panel Statement: The panel agrees with the original proposal but has allowed for delayed implementation. See panel action on Comment 14-28.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Comment on Affirmative:

COSPOLICH, J.: This should become effective with the 2008 NEC.

14-28 Log #1872 NEC-P14 Final Action: Accept in Principle (502.120(B)(2))

TCC Action: The Technical Correlating Committee directs that the panel action be modified to editorially correct the use of the term “provided” so that the last portion of the first sentence reads “…or shall be installed in dusttight enclosures.”

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 14-64

Recommendation: Revise text to read as follows:

(2) Coils and Windings. Where not located in the same enclosure with switching mechanisms, control transformers, solenoids, and impedance coils shall be provided with tight metal housings without ventilating openings or in dusttight enclosures.

Substantiation: With the addition of the defined term “dusttight” clearly coils and windings should be located within this type of enclosure. However, the historical precedence of permitting the use of a tight metal housing has existed without being cited as an unsafe condition. No justification has been offered to delete the current practice and this text should therefore be retained.

Panel Meeting Action: Accept in Principle

Revise 502.120B(2) to read:

(2) Coils and Windings. Where not located in the same enclosure with switching mechanisms, control transformers, solenoids, and impedance coils shall be provided with tight metal housings without ventilating openings or shall be provided in dusttight enclosures. Effective January 1, 2011, only dusttight enclosures shall be permitted.

Panel Statement: The panel has provided this for manufacturers to transition their equipment to dusttight.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Comment on Affirmative:

COSPOLICH, J.: This should become effective with the 2008 NEC.
Ballot Results: Affirmative: 13 Negative: 1
Explanation of Negative:
WECHSLER, D.: The action taken by the Panel should have been to reject this original proposal 1873 by accepting this comment. While it is probably a good goal for the next code cycle to reconsider an editorial rewrite of Article 502 to correct a number of seemingly conflicting texts, the proposed action on this proposal does not make any sense. The current text in 502.150(B)(2) addresses “Luminaries…where NOT of a type identified for Class II locations…” and specifically that apparatus as defined in the proposed deleted text addresses this permitted apparatus. The new proposed text to provide dusttight enclosures which would be of a type that is identified for Class II locations, would not be of a type that is not identified Class II locations. Therefore this proposal needs to be rejected.
Panel Meeting Action: Reject
Panel Statement: The commenter has not provided any additional information to justify rejecting the proposal.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

14-33 Log #458 NEC-P14 (502.140(B)) Final Action: Reject
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 14-71
Recommendation: Accept as revised:
(1) Be connected to terminals in an approved manner in accordance with 110.14
(2) Be connected to terminals in an approved manner in accordance with 501.45
(3) Be connected to terminals in an approved manner in accordance with 501.45
Alternately, delete (3).
Substantiation: Proposal provides specificity. Panel statement that reference to 110.14 is not necessary because it already applies, also makes (3) unnecessary. The requirements of 110.14 and this section, worded differently may cause confusion.
Panel Meeting Action: Reject
Panel Statement: The reference to 110.14 is not necessary because it applies throughout the Code. The CMP-14 notes that the complete wording of 502.140(3) was not shown.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1
Explanation of Negative:

14-33a Log #C1400 NEC-P14 (502.150(B)) Final Action: Accept
TCC Action: To be consistent with the panel action on Comment 14-28 and to correct the errors noted in the negative voting, the Technical Correlating Committee directs that the panel action be modified as follows:
Revise Item (b)(1) of the panel action to read:
“(1) Contacts. Enclosures shall comply with 502.150(A)(2), or contacts shall have tight metal enclosures designed to minimize the entrance of dust and shall have telescoping or tight-fitting covers and no openings through which, after installation, sparks or burning material might escape or shall be installed in dusttight enclosures, effective January 1, 2011, only dusttight enclosures shall be permitted.”
The Exception remains as shown in the panel action.
Revise Item (b)(2) of the panel action to read:
“(2) Transformers and Similar Equipment. The windings and terminal connections of transformers, choke coils, and similar equipment shall comply with 502.120(B)(2).”
Revise Item (b)(3) of the panel action to read:
“(3) Resistors and Similar Equipment. Resistors, resistance devices, thermionic tubes, rectifiers, and similar equipment shall comply with 502.120(B)(3).”
**Report on Comments A2007 — Copyright, NFPA**

**Submitter:** Code-Making Panel 14,

**Comment on Proposal No:** 14-73

**Recommendation:** Revise 502.150(B) to read as follows:

(B) Class II, Division II, Location Groups IA, IB, IC, and IC, signaling, alarm, remote-control, and communications systems; and meters, instruments, and relays shall comply with 502.150(B)(1) through (B)(5).

(1) Contacts. Contacts shall be provided in dusttight enclosures. shall comply with 502.150(A)(2), or metal enclosures designed to minimize the entrance of dust and shall have telescoping or tight-fitting covers and no openings through which, after installation, sparks or burning material might escape.

Exception: In nonincendive circuits, enclosures shall be permitted to be of the general-purpose type.

(2) Transformers and Similar Equipment. The windings and terminal connections of transformers, choke coils, and similar equipment shall comply with 502.120(B)(2) be provided with tight metal enclosures without ventilating openings.

(3) Resistors and Similar Equipment. Resistors, resistance devices, thermionic tubes, rectifiers, and similar equipment shall comply with 502.120(B)(3) 502.150(A)(3).

Exception: Enclosures for thermionic tubes, nonadjustable resistors, or rectifiers for which maximum operating temperature will not exceed 120°C (248°F) shall be permitted to be of the general-purpose type.

(4) Transformers and Similar Equipment. The windings and terminal connections of transformers, choke coils, and similar equipment shall comply with 502.120(B)(2) be provided with tight metal enclosures without ventilating openings.

Comment on Affirmative:

**NEAGLE, J.:** The recommendation made by CMP-14 includes several types, accepting this recommendation would accept these types into the NEC text. In Item (B)(1), the capital “E” should be deleted from the word “enclosures,” and the word should be immediately followed by a comma, not a period. In Item (B)(2), the capital “T” should be deleted from the word “transformers.”

**WECHSLER, D.:** My notes from this action in part agree with the comments of Ed Briesch, but with some differences. In brief summary, my notes reflect that following discussions the Committee action focused on a “principle” which was the aspect of “how tight” a metal enclosure was, and that dusttight provided this definition. However the metal enclosure had been an accepted NEC practice without any problem over many years of use and it was concluded that a good fix to allow for implementation was to do as was done in Comment 14-28. Comment 14-28 caused a sentence to be added to the end of the existing text which read, “Effective January 1, 2011 only dusttight enclosures shall be permitted”.

The Committee action for this Committee generated Comment (14-33a) to accept is actually based upon the “accept in principle” “See action on Comment 14-28” and was to apply the time implementation sentence to the end of the existing text. Since the former action on the proposal 14-73 was to accept, the Committee comment began with the proposal text. The committee actually agreed not to accept the proposal text but as was done in 14-28 accept in principle regarding the metal enclosure as the principle but with the action of 14-28. This is why the text appears in the ballot action. Missing however were the editorial strikeouts, etc which is the point correctly identified by Ed Briesch. However adding the new sentence “Effective January 1, 2011 only dusttight enclosures shall be permitted” does not work for this 502.150(B)(1) paragraph because enclosures may still comply with 502.150(A)(2) (a condition found in the first part of this clause) and there was no action to change 502.150(A)(2). Therefore, to correct just this portion of the action, the Committee should read as follows:

(502.150)

(B) Class II, Division 2. In Class II, Division 2 locations, signaling, alarm, remote-control, and communications systems; and meters, instruments, and relays shall comply with 502.150(B)(1) through (B)(5).

(1) Contacts. Enclosures shall comply with 502.150(A)(2), or contacts shall either be in dusttight enclosures or have tight metal enclosures designed to minimize the entrance of dust and shall have telescoping or tight-fitting covers and no openings through which, after installation, sparks or burning material might escape. Effective January 1, 2011, only dusttight enclosures shall be permitted.

Exception: In nonincendive circuits, enclosures shall be permitted to be of the general-purpose type.

Affirmative: 12 Negative: 2

**Explanation of Negative:**

BRIESCH, E.: The text of the recommendation for Comment 14-33a provided with the ballot from NFPA is not what was agreed upon and accepted by the panel at the ROC meeting. Comment 14-33a modifies the panel action to accept Proposal 14-73. The following text is what I believe, based on my notes, was accepted as Comment 14-33a and correlates with the action taken on comment 14-28.

(B) Class II, Division 2. In Class II, Division 2 locations, signaling, alarm, remote-control, and communications systems; and meters, instruments, and relays shall comply with 502.150(B)(1) through (B)(5).

(1) Contacts. Enclosures shall comply with 502.150(A)(2), or contacts shall have tight metal enclosures designed to minimize the entrance of dust and shall have telescoping or tight-fitting covers and no openings through which, after installation, sparks or burning material might escape or shall be provided in dusttight enclosures, effective January 1, 2011, only dusttight enclosures shall be permitted.

Exception: In nonincendive circuits, enclosures shall be permitted to be of the general-purpose type.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 248°F shall be permitted to be of the general-purpose type.

(2) Transformers and Similar Equipment. The windings and terminal connections of transformers, choke coils, and similar equipment shall comply with 502.120(B)(2) be provided with tight metal enclosures without ventilating openings.

(3) Resistors and Similar Equipment. Resistors, resistance devices, thermionic tubes, rectifiers, and similar equipment shall comply with 502.120(B)(3) 502.150(A)(3).

Exception: Enclosures for thermionic tubes, nonadjustable resistors, or rectifiers for which maximum operating temperature will not exceed 120°C (248°F) shall be permitted to be of the general-purpose type.

**Submitter:** William M. Lewis, Martinsville, IN

**Comment on Proposal No:** 14-73

**Recommendation:** The proposal should be rejected.

**Substantiation:** The submitter provided no technical justification nor record of safety issues that would justify deleting the exception.

**Panel Meeting Action:** Reject

**Panel Statement:** See Panel Comment 14-33a (Log #CC1400).

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 14
ARTICLE 503 CLASS III LOCATIONS

14-36 Log #126 NEC-P14
(503.30(A) Exception)
Final Action: Accept in Part

TCC Action: The Technical Correlating Committee directs that the Exception to 503.30(A), be revised to read as follows:
“Exception: The specific bonding means shall be required only to the nearest point where the grounded circuit conductor and the grounding electrode are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B), provided the branch-circuit overcurrent protection is located on the load side of the disconnecting means.”

This action correlates the exception with the revised text of 250.32 as accepted by Code-Making Panel 5 in Comment 5-58.

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-81
Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part
Panel Statement: See panel action on Comment 14-18.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-37 Log #428 NEC-P14
(503.13(B))
Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 14-83
Recommendation: Accept proposal revised: A luminaire (fixture) that may be likely to be exposed to physical damage shall be protected by a suitable guard.

Substantiation: Panel statement is that this requirement covers luminaires that are subject to damage on an intermittent basis or changing conditions. The text does not reflect those conditions. The word “may” includes unforeseeable future conditions. This section does not correlate with 110.27(B) which uses the phrase “likely to be exposed to physical damage”. Many “not permitted” uses in the code simply state: “where subject to physical damage” without qualifiers of continuous or intermittent basis or different conditions.

Panel Meeting Action: Reject
Panel Statement: The panel continues to reject the proposal and concludes that the word “may” is correct.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-38 Log #459 NEC-P14
(503.140(3))
Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 14-84
Recommendation: Accept as revised:
(3) Be connected to terminals in an approved manner in accordance with 110.14 and 503.145. Alternatively, delete (3).

Substantiation: Proposal provides specificity. Panel statement that reference to 110.14 is not necessary because it already applies, also makes (3) unnecessary. The requirements of 110.14 and this section, worded differently, may cause confusion.

Panel Meeting Action: Reject
Panel Statement: The reference to 110.14 is not necessary because it applies throughout the Code.

CMP-14 notes that the complete wording of 503.140(3) was not shown.
Comment on Proposal No: 14-22
Recommendation: Reject the Panel’s action on 504.50(A) and keep the original proposed text.

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 14-44
Recommendation: Reconsider the proposal and revise both the new FPN to (1) and the existing FPN No. 1 to item (5) to comply with the NEC Style Manual. Both FPNs contain recommendations and interpretations in the form of a “preferred method” and the text “generally considered acceptable”. FPNs shall only contain explanatory information. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Final Action: Accept (504.30(A)(2))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-89
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal and revise both the new FPN to (1) and the existing FPN No. 1 to item (5) to comply with the NEC Style Manual. Both FPNs contain recommendations and interpretations in the form of a “preferred method” and the text “generally considered acceptable”. FPNs shall only contain explanatory information. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Final Action: Accept (504.30(A)(2))

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 14-22
Recommendation: Reject the Panel’s action on 504.50(A) and keep the original proposed text.

Substantiation: The Panel rejected the original proposal indicating “…because connection to an equipment grounding conductor is not always the appropriate method to accomplish the requirement of 504.50(A).” The Grounding and Bonding Task Group recognizes that in certain instances supplemental bonding to a grounding electrode may be required. However, the requirements for connection to a grounding electrode can be found in 504.50(B) as well as the FPN to 504.50(A). The requirements in 504.50(A) apply only to connection to the equipment grounding conductor. Applying the definitions of Equipment Grounding Conductor and Grounded in Proposal 5-6, 504.50(A) should be revised as indicated in the original proposed text.

Reason for suggested change, “Fine Print Notes are not permitted to contain requirements.”

Panel Meeting Action: Accept in Principle
Revise 504.50 to read:
“(A) Intrinsically Safe Apparatus, Enclosures, Associated apparatus, and Raceways. Intrinsically safe apparatus, associated apparatus, cable shields, enclosures, and raceways, if of metal, shall be grounded connected to the equipment grounding conductor.

(B) Associated Apparatus and Cable Shields. Associated apparatus and cable shields shall be grounded in accordance with the required control drawing. See 504.30(A) FPN.”

FPN: Supplementary connection(s) bonding to the grounding electrode may be needed for some associated apparatus, for example, zener diode barriers, if specified in the control drawing. See ANSI/ISA RP 12.06.01-2003-2005, Wiring Methods for Hazardous (Classified) Locations Instrumentation Part 1: Intrinsic Safety.”

Designate current (B) as (C). Delete current (C) and its exception.

Panel Statement: The panel split 504.50(A) into two parts so that the term “equipment grounding conductor” can be applied correctly as the task group recommended. With this change, the language of the fine print note was modified to be consistent with (A) and (B).

This action supercedes the action on Proposal 14-91 and incorporates the action from Proposal 14-92.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 505 CLASS I, ZONE 0, 1, AND 2 LOCATIONS

Comment on Proposal No: 14-109
Recommendation: Reconsider the proposal and revise both the new FPN to (1) and the existing FPN No. 1 to item (5) to comply with the NEC Style Manual. Both FPNs contain recommendations and interpretations in the form of a “preferred method” and the text “generally considered acceptable”. FPNs shall only contain explanatory information. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Final Action: Accept (505.7(A))

Submitter: Steven R. Carlson, Pfizer Global Manufacturing

Comment on Proposal No: 14-101
Recommendation: Clarify the use of IEC (European) rated equipment for Zone use in the United States. Within the pharmaceutical industry, many suppliers are of EU origin and rate their equipment according to IEC standards.

Substantiation: Using a different Zone rating from EU source creates confusion and ultimately will lead to misinterpretation of what is acceptable. For instance, if a piece of equipment carries an EU Class I Zone 2 designation, it would be acceptable for US Zone 2 installations. Having separate requirements causes added expense and an uncompetitive position for US industry.

Panel Meeting Action: Reject
Panel Statement: The comment does not include a recommendation and does not comply with Section 4.4.5 of the Regulations Governing Committee Projects. The panel notes that IEC, European, and NEC equipment requirements are not the same. Electrical equipment used in hazardous (classified) locations in the United States is subject to the OSHA 29 CFR 1910 requirements.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

Comment on Proposal No: 14-109
Recommendation: Reconsider the proposal and revise both the new FPN to (1) and the existing FPN No. 1 to item (5) to comply with the NEC Style Manual. Both FPNs contain recommendations and interpretations in the form of a “preferred method” and the text “generally considered acceptable”. FPNs shall only contain explanatory information. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Reject
Panel Statement: The panel rejects the original proposal indicating “…because connection to an equipment grounding conductor is not always the appropriate method to accomplish the requirement of 504.50(A).” The Grounding and Bonding Task Group recognizes that in certain instances supplemental bonding to a grounding electrode may be required. However, the requirements for connection to a grounding electrode can be found in 504.50(B) as well as the FPN to 504.50(A). The requirements in 504.50(A) apply only to connection to the equipment grounding conductor. Applying the definitions of Equipment Grounding Conductor and Grounded in Proposal 5-6, 504.50(A) should be revised as indicated in the original proposed text.

Reason for suggested change, “Fine Print Notes are not permitted to contain requirements.”

Panel Meeting Action: Accept in Principle
Revise 504.50 to read:
“(A) Intrinsically Safe Apparatus, Enclosures, Associated apparatus, and Raceways. Intrinsically safe apparatus, associated apparatus, cable shields, enclosures, and raceways, if of metal, shall be grounded connected to the equipment grounding conductor.

(B) Associated Apparatus and Cable Shields. Associated apparatus and cable shields shall be grounded in accordance with the required control drawing. See 504.30(A) FPN.”

FPN: Supplementary connection(s) bonding to the grounding electrode may be needed for some associated apparatus, for example, zener diode barriers, if specified in the control drawing. See ANSI/ISA RP 12.06.01-2003-2005, Wiring Methods for Hazardous (Classified) Locations Instrumentation Part 1: Intrinsic Safety.”

Designate current (B) as (C). Delete current (C) and its exception.

Panel Statement: The panel split 504.50(A) into two parts so that the term “equipment grounding conductor” can be applied correctly as the task group recommended. With this change, the language of the fine print note was modified to be consistent with (A) and (B).

This action supercedes the action on Proposal 14-91 and incorporates the action from Proposal 14-92.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14
TCC Action: The Technical Correlating Committee directs that FPN No. 1 of 505.8(K) be deleted in accordance with the direction given to the panel in Comment 14-46. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

In addition, the Technical Correlating Committee directs that the following references be added to Annex A of the NEC.

"Combustible Gas Detectors, Performance Requirements - ANSI/ISA 12.13.1-01"

“Gas and Vapor Detector Sensors - ANSI/UL 2075”

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-119

Recommendation: Revise original proposal to read:

(g) In industrial establishments with restricted public access, where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage, listed TC-ER cable, with suitable overall jacket of suitable material, a basket weave conductive armor beneath the outer jacket, shall be permitted to be installed where all of the following conditions are met:

(1) Maximum length is 3 meters
(2) Has separate grounding in accordance with 250.122
(3) Maximum conductor size is #14awg.
(4) Use is restricted to shielded pair (single or multiple pair) instrument cables or multiple conductor control cable
(5) Termination fittings listed for the application are used
(6) Termination fittings provide continuity with conductive armor
(7) Cable is installed according to the requirements of Article 336.10(7)

Exception.

Substantiation: All substantiation stated in original proposal still holds. The primary issue is to provide an installation such that the connecting cable to devices and equipment that is subject to removal or overhaul is not subject to damage when disconnected from the device or equipment. MC-HL cable is very frequently and easily damaged by the activity because it cannot be moved clear of the work area sufficiently. The damage to the cables include crimped and broken armor due to over bending, deformation of the armor, damage to the jacket and other compromise to the cable configuration by the work activities and tools and equipment employed in the removal or repair activities.

The AHJ in Alaska has become aware of the damage that is done to MC-HL cable when disconnected from its equipment or end device and has expressed concern on this subject. The submitter did not provide any technical or convincing argument to remove or modify this provision.

14-47 Log #634 NEC-P14 Final Action: Reject (505.8(I))

Submitter: Eliana Beattie, ISA

Comment on Proposal No: 14-117

Recommendation: The panel statement indicates that the referenced standard containing the recommendation is not currently published. The referenced standard will be published and publicly available prior to the ROC meeting.

Substantiation: The standard referenced, ISA TR12.13.03 will be published prior to the ROC meeting.

Panel Meeting Action: Reject

Panel Statement: This standard has not been published and, therefore, cannot be referenced.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14
By shipboard cable, it is assumed that the submitter refers to Marine Shipboard Cable. The proposal requires a maximum length of 3 meters. The proposed wording requires termination fittings listed for the application. The Technical Correlating Committee intends that the use of Annex A be maintained and that the wording provided in the annex be included. The Technical Correlating Committee directs the panel to reconsider the action on this proposal and remove the redundant reference to Article 356 which is already covered by 505.15(B). This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 14-66. No number eligible to vote.

Final Ballot Results: Affirmative: 14

14-51 Log #133 NEC-P14 Final Action: Accept (505.15(B)(1)(f))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-128
Recommendation: The Technical Correlating Committee directs the panel to reconsider the action on this proposal and remove the redundant reference to Article 356 which is already covered by 505.15(B). This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 14-53. No number eligible to vote.

Final Ballot Results: Affirmative: 14

14-52 Log #1385 NEC-P14 Final Action: Accept (505.15(B)(1)(f))

Submitter: William Wagner, Certification Solutions
Comment on Proposal No: 14-128
Recommendation: This Proposal should be Accepted as originally proposed.

Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 14-53. Number eligible to vote: 14

Final Ballot Results: Affirmative: 14

14-53 Log #357 NEC-P14 Final Action: Accept (505.15(B)(1)(f))

Submitter: Code-Making Panel 8,
Comment on Proposal No: 14-128
Recommendation: CMP-8 recommends that CMP-14 accept this proposal in principle with the revised text:

(f) Rigid nonmetallic conduit complying with Article 356 shall be permitted when encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade.

Substantiation: As noted in the TCC action on this proposal, this is a redundant reference to Article 356 as it is already covered by 505.15(B). Additionally, with the panel actions taken on Proposals 8-53 and 8-78, it is also an incorrect reference, as Article 356 now only pertains to Type PVC rigid nonmetallic conduit. Types HDPE and RTRC, which were formerly covered by Article 356, are now covered by Articles 353 and 355, respectively.

Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 14-53. Number eligible to vote: 14

Final Ballot Results: Affirmative: 14

14-54 Log #549 NEC-P14 Final Action: Accept in Principle (505.15(C)(1))

TCC Action: The Technical Correlating Committee directs that the proposal added in the panel action for 505.15(C)(1) be deleted. This action is consistent with the Technical Correlating Committee direction given to place product standards references in annex A. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

Submitter: Edward M. Briesch, Underwriters Laboratories Inc.
Comment on Proposal No: 14-33a
Recommendation: Revise text to read as follows:

(C) Class I, Zone 2.

1. General. In Class I, Zone 2 locations, the wiring methods in (C)(1)(a) through (C)(1)(g) shall be permitted.
   (a) All wiring methods permitted by 505.15(B).
   (b) Types MI, MC, MV, or TC cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. Single conductor Type MV cables shall be shielded or metallic armored.
TCC Action: The Technical Correlating Committee directs that FPN No. 2 of 505.17(6) be deleted in accordance with the direction given to the panel in Comment 14-56. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No. 14-133

Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and to relocate the reference in FPN No. 2 into Annex A to be consistent with other parts of the Code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

Panel Statement: See panel action on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-57 Log #460 NEC-P14 Final Action: Reject (505.17(3))

Submitter: Dan Leaf, Seneca, SC

Proposal on Comment No: 14-134

Recommendation: Accept as revised:

(3) Be connected to terminals in an approved manner in accordance with 110.14 and 503.145. Alternatively, delete (3).

Substantiation: Proposal provides specificity. Panel statement that reference to 110.14 is not necessary because it already applies also makes (3) unnecessary. The requirements of 110.14 and this section, worded differently, may cause confusion.

Panel Meeting Action: Reject

Panel Statement: The reference to 110.14 is not necessary because it applies throughout the Code.

CMP-14 notes that the complete wording of 505.17(3) was not shown.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

COOK, D.: The submitter and the panel statement both clarify that nothing in 505.17(3) is different than the general requirements in Chapters 1 through 4. NEC 90.3 states the requirements in Chapters 5, 6, and 7 supplement or modify the general rules. The CMP-14 statement indicates there is no reason to include a reference to the general requirements for termination included in 110.14 and I agree with that statement. The current text requires the cord to be terminated in an approved manner which is required for all installations in 110.2. The submitter’s alternate recommendation was to delete item 3 completely. Since the text does not supplement or modify the general requirements in Chapters 1 through 4, that recommendation should be accepted.

14-58 Log #136 NEC-P14 Final Action: Accept in Part (505.25(A) Exception)

TCC Action: The Technical Correlating Committee directs that the Exception to 505.25(A), be revised to read as follows:

“Exception: The specific bonding means shall be required only to the nearest point where the grounded circuit conductor and the grounding electrode are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B), provided the branch-circuit overcurrent protection is located on the load side of the disconnecting means.”

This action correlates the exception with the revised text of 250.32 as accepted by Code-Making Panel 5 in Comment 5-58.

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 14-137

Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-119. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

Panel Statement: See panel action on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-59 Log #144 NEC-P14 Final Action: Accept in Part (505.17(6))

TCC Action: The Technical Correlating Committee directs that FPN No. 2 of 505.17(6) be deleted in accordance with the direction given to the panel in Comment 14-56. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 14-133

Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and to relocate the reference in the FPNs into Annex A to be consistent with other parts of the Code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

Panel Statement: See panel action on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-60 Log #176 NEC-P14 Final Action: Reject (505.17(6))

TCC Action: The Technical Correlating Committee directs that FPN No. 2 of 505.17(6) be deleted in accordance with the direction given to the panel in Comment 14-56. The Technical Correlating Committee intends that the use of Annex A be consistent throughout the code.

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 14-133

Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and to relocate the reference in the FPNs into Annex A to be consistent with other parts of the Code. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

Panel Statement: See panel action on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-61 Log #178 NEC-P14 Final Action: Accept in Part (505.17(6))
ARTICLE 506  ZONE 20, 21, AND 22 LOCATIONS FOR COMBUSTIBLE DUSTS, FIBERS AND FLYINGS

14-59 Log #137 NEC-P14 Final Action: Accept in Part (506.2)

TCC Action: The Technical Correlating Committee directs that the FFN to the term “Dusttight” in 506.2 be deleted since the term dusttight is utilized throughout the NEC and the reference to the nonincendive equipment standard appears in the definitions that apply to nonincendive equipment.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-139a

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept in Part

The panel has accepted the direction of the TCC to reconsider the comments made during voting on the proposal. The referenced standards have now been published and the original action on the proposal stands. The panel recommends that the standard also be added to the list in Annex A, as well as be retained in this fine print note.

Panel Statement: See panel statement on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-60 Log #632 NEC-P14 Final Action: Accept (506.2)

Submitter: Eliana Beattie, ISA

Comment on Proposal No: 14-143

Recommendation: The panel statement indicates that the standard covering the protection techniques specified in the recommendation is not currently published. The referenced standard has since been published and is publicly available. The original proposal should be approved as written.

Substantiation: This standard referenced, ISA 61241-18, was published on June 27, 2006.

Panel Meeting Action: Accept

Panel Statement: The action is to accept Proposal 14-143 in its entirety. The panel recommends that the standard also be added to the list in Annex A, as well as be retained in this fine print note.

Panel Statement: See panel statement on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-61 Log #633 NEC-P14 Final Action: Accept (506.2)

Submitter: Eliana Beattie, ISA

Comment on Proposal No: 14-140

Recommendation: The panel statement indicates that the standard covering the protection technique specified in the recommendation ("ID") is not currently published. The referenced standard for type of protection “ID” has since been published and is publicly available. The original proposal should be approved as written.

Substantiation: ISA 61241-1 (type of protection “ID”) is published.

Panel Meeting Action: Accept

Panel Statement: The action is to accept Proposal 14-140 in its entirety. The panel recommends that the standard also be added to the list in Annex A, as well as be retained in this fine print note.

Panel Statement: See panel statement on Comment 14-5.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-62 Log #710 NEC-P14 Final Action: Accept (506.2)

Submitter: Eliana Beattie, ISA

Comment on Proposal No: 14-139a

Recommendation: The explanations of negative votes indicates that the standards covering the protection techniques specified in the recommendation ("PD" & "ID") are not currently published. The referenced standard for type of protection “ID” has since been published and is publicly available. The referenced standard for type of protection “PD” will be published and publicly available prior to the ROC meeting. The original proposal should be approved as written.

Substantiation: ISA 61241-11 (type of protection “ID”) is published. ISA 61241-2 (type of protection “PD”) will be published prior to the ROC meeting.

Panel Meeting Action: Accept

Panel Statement: The action is to accept Proposal 14-139a in its entirety. The panel recommends that the standard also be added to the list in Annex A, as well as be retained in this fine print note.

Panel Statement: See panel statement on Comment 14-5. This is consistent with the panel’s action on Comment 14-59.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-63 Log #631 NEC-P14 Final Action: Accept in Part (506.8)

Submitter: Eliana Beattie, ISA

Comment on Proposal No: 14-149

Recommendation: The panel statement indicates that the standard covering the protection techniques specified in the recommendation is not currently published. The referenced standard has since been published and is publicly available. The original proposal should be approved as written.

Substantiation: The standard referenced, ISA 61241-18, was published on June 27, 2006.

Panel Meeting Action: Accept in Part

Panel Statement: The action is to accept Proposal 14-149 without the fine print note. The panel rejects the fine print note because it already is identified in the definitions section of this article, in accordance with Comment 14-60.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-64 Log #909 NEC-P14 Final Action: Accept in Principle (506.8)

Submitter: Nicholas P. Ludlam, FM Approvals

Comment on Proposal No: 14-150a

Recommendation: Revise as follows:

506.8 Protection Techniques. Acceptable protection techniques for electrical and electronic equipment in hazardous (classified) locations shall be as described in 506.8(A) through 506.8(F).

Substantiation: With the addition of pressurization “PD” and intrinsic safety “ID” the references in the leading paragraph are incorrect.

Panel Meeting Action: Accept in Principle

Panel Statement: Revise 506.8 to read:

506.8 Protection Techniques. Acceptable protection techniques for electrical and electronic equipment in hazardous (classified) locations shall be as described in 506.8(A) through 506.8(F).

Panel Statement: The panel has corrected the references to include all new additional protection methods.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-65 Log #914 NEC-P14 Final Action: Reject (506.8(B) and (G))

Submitter: Nicholas P. Ludlam, FM Approvals

Comment on Proposal No: 14-150a

Recommendation: Revise as follows:

(B) Pressurized. This protection technique shall be permitted for equipment in zone 21 and Zone 22 locations for which it is identified.

(G) Protection by pressurization “PD”. This protection technique shall be permitted for equipment in Zone 21 and Zone 22 locations for which it is identified.

Substantiation: Combine the two definitions for protection techniques. Pressurized equipment protected by “IP” will also be marked with the Zone of use.

Panel Meeting Action: Reject

Panel Statement: The two protection techniques defined in 506.2, whilst similar, are not considered identical and are covered by different product standards.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

14-66 Log #911 NEC-P14 Final Action: Reject (506.8(C) and (H))

Submitter: Nicholas P. Ludlam, FM Approvals

Comment on Proposal No: 14-150a

Recommendation: Revise as follows:

(C) Intrinsic Safety. This protection technique shall be permitted for equipment in Zone 20, Zone 21, and Zone 22 locations for which it is identified. Installation of intrinsically safe apparatus and wiring shall be in accordance with the requirements of Article 504.

(H) Protection by intrinsic safety “ID”. This protection technique shall be permitted for equipment in Zone 20, Zone 21, and Zone 22 locations for which it is identified.

Substantiation: Combine the two definitions for protection techniques. Intrinsically safe equipment protected by “ID” will also be marked with the Zone of use.

Panel Meeting Action: Reject

Panel Statement: See panel action on Comment 14-65.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14
Submission: Eliana Beattie, ISA

Comment on Proposal No: 14-150
Recommendation: The statement indicates that the standard covering the protection technique specified in the recommendation ("I") is not currently published. The referenced standard for type of protection "I" has since been published and is publicly available. The original proposal should be approved as written.

Substantiation: ISA 61241-1 (type of protection "I") is published.
Panel Meeting Action: Accept

Panel Statement: The action is to accept Proposal 14-150 in its entirety. The Panel recommends that the standard also be added to the list in Annex A, as well as be retained in this fine print note. See panel statement on Comment 14-5.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-68 Log #637 NEC-P14 (506.8(J) and (K))

Submission: Eliana Beattie, ISA

Comment on Proposal No: 14-150a
Recommendation: The explanation of negative votes indicates that the standards covering the protection techniques specified in the recommendation ("P"D & "P"D) are not currently published. The referenced standard for type of protection "P"D will be published and publicly available prior to the ROC meeting. The original proposal should be approved as written.

Substantiation: ISA 61241-11 (type of protection "P"D) is published. ISA 61241-2 (type of protection "P"D) will be published prior to the ROC meeting.
Panel Meeting Action: Accept

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-49 Log #138 NEC-P14 (506.8(J) & (K))

Submission: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 14-150
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept in Part

Panel Statement: The panel has accepted the direction of the TCC to reconsider the comments made during voting on the proposal.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-70 Log #915 NEC-P14 (506.9)

Submission: Nicholas P. Ludlam, FM Approvals

Comment on Proposal No: 14-153
Recommendation: Delete existing Table 506.20(F) and replace with the proposed table as shown below and relocate to 506.9, renumber table and references to align.

Table 506.9(C)(2)(2) Types of Protection Designation

<table>
<thead>
<tr>
<th>Designation</th>
<th>Technique</th>
<th>Zone*</th>
</tr>
</thead>
<tbody>
<tr>
<td>nD</td>
<td>Protection by intrinsic safety</td>
<td>20</td>
</tr>
<tr>
<td>bD</td>
<td>Protection by intrinsic safety</td>
<td>21</td>
</tr>
<tr>
<td><strong>aD</strong></td>
<td>Associated apparatus</td>
<td>Unclassified*</td>
</tr>
<tr>
<td>bD</td>
<td>Protection by encasement</td>
<td>20</td>
</tr>
<tr>
<td><strong>bD</strong></td>
<td>Protection by encasement</td>
<td>21</td>
</tr>
<tr>
<td>mD</td>
<td>Protection by pressurization</td>
<td>23</td>
</tr>
<tr>
<td><strong>pD</strong></td>
<td>Protection by enclosures</td>
<td>21</td>
</tr>
</tbody>
</table>

*Does not address use where a combination of techniques is used.

**Associated apparatus is not permitted to be installed in a hazardous (classified) location if suitably protected using another type of protection.

Delete clause 506.20(F)
**Substantiation:** This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

**Panel Meeting Action:** Accept in Part

The panel accepts the direction from the Technical Correlating Committee to reconsider the action on Proposal 14-155. CMP-14 recognizes that CMP-5 actions on Proposal 5-119 have revised the application of 506.25(A) Exception. However, the text in 506.25(A) Exception remains correct.

**Panel Statement:** The text continues to reference applicable requirements: 250.32(A), (B), and (C). No additional action is required from CMP-14 for correlation.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 14

### ARTICLE 511 COMMERCIAL GARAGES, REPAIR AND STORAGE

14-77 Log #1946 NEC-P14  
**Final Action:** Accept

511.3(A))

**Submitter:** Frederic P. Hartwell, Hartwell Electrical Services, Inc.

**Comment on Proposal No:** 14-156

**Recommendation:** Accept the proposal, except in 511.3(A) change “unclassified” to “permitted to be unclassified.”

**Substantiation:** The proposed text is now fully in accordance with the existing NEC text. The submitter respectfully disagrees with CMP 14 relative to editorial merit. The existing NEC syntax is one of the most difficult passages in the entire code, because there are two parallel subsections, each of which overlaps the other. For example, you may have a ventilated floor that suggests a lack of classification and a pit that does suggest classification. When this first appeared in the ROP I spent 4 days trying to sort out exactly what went where, finally working long hours over the telephone with Marshall Klein on the 30A Committee. The comment also brings in a more well-rounded selection of extracted material, which provides essential context and assures comprehensive coverage. In the end, we came up with a product that he suggested go into the NEC Handbook as the guide text to 511.3. Please revisit this proposal on its merits.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 14
ARTICLE 513 AIRCRAFT HANGARS

14-80 Log #144 NEC-P14 Final Action: Accept (513.16(A))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-170
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting in accordance with 4.1.1 of the NEC Style Manual. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Delete the reference to Article 250 in 513.16(A).
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

14-81 Log #399 NEC-P14 Final Action: Accept (513.16(A))

Submitter: Daniel Leaf, Seneca, SC
Comment on Proposal No: 14-170
Recommendation: Accept the proposal.
Substantiation: Same as proposal. Many sections requiring grounding do not add the phrase “in accordance with Article 250.” If grounding is done, it generally has to comply with Article 250 since 250.1(1)(2)(3)(4) is inclusive.

Panel Meeting Action: Accept
Delete the reference to Article 250 in 513.16(A).
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 514 MOTOR FUEL DISPENSING FACILITIES

14-82 Log #145 NEC-P14 Final Action: Accept (514.16)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 14-181
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to 4.1.1 of the NEC Style Manual. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Delete the reference to Article 250 in 514.16(A).
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 515 BULK STORAGE PLANTS

14-83 Log #358 NEC-P14 Final Action: Accept in Principle (515.7(A))

Submitter: Code-Making Panel 8,
Comment on Proposal No: 14-184
Recommendation: CMP-8 recommends that CMP-14 accept this proposal in principle with the revised text:
(A) Fixed Wiring. All fixed wiring above Class I locations shall be in metal raceways, Schedule 80 PVC Conduit, Type RTRC marked with suffix XX, MI, TC or MC cable.

Substantiation: CMP-8 recommends CMP-14 Accept in Principle Proposal 14-184 with the proposed revision. Type RTRC conduit listed for and identified for use in areas of physical damage per 355.10(F) is the only type RTRC conduit equivalent to Schedule 80 PVC conduit. 355.10(F) is referenced based on the Panel 8 action on Proposal 8-78.
This comment has been balloted through CMP-8 with the following ballot results:
12 Eligible to Vote
12 Affirmative

Mr. R. Loyd voted affirmatively stating: “Proposal 14-184 was to Accept in Principle. I agree with Mr. Burns’ recommendation to revise the panel action, however there is no fiber glass conduit equal to Schedule 80 PVC conduit and I believe omitting the reference to RTRC would make the text more user friendly.”

Panel Meeting Action: Accept in Principle
Revise 515.7(A) to read: All fixed wiring above Class I locations shall be in metal raceways, Schedule 80 PVC Conduit, Type RTRC marked with suffix XX, MI, TC or MC cable.

Panel Statement: The revised text correlates with the panel action on Comment 14-8 and meets the intent of the commenter.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

ARTICLE 516 SPRAY APPLICATION, DIPPING, AND COATING PROCESSES

14-84 Log #1252 NEC-P14 Final Action: Accept in Principle (516.10(A)(6), 516.10(B)(4) and 516.10(C)(4)(b))

“TCC Action: The Technical Correlating Committee directs that the FPN added by the panel be revised to read as follows:
“FPN: For more information on grounding and bonding for static electricity purposes, see NFPA 33 - Standard for Spray Application Using Flammable or Combustible Materials, NFPA 34 - Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids and NFPA 77 - Recommended Practice on Static Electricity.”
This action corrects the implied mandatory reference to NFPA 33, 34, and 77 by the FPN accepted by the panel.
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 14-22
Recommendation: Reject the Panel’s action on 516.10(A)(6), 516.10(B)(4) and 516.10(C)(4)(b) and modify the text as follows:
Revise 516.10(A)(6) as follows:
(6) Grounding. All electrically conductive objects in the spray area, except those objects required by the process to be at high voltage, shall be adequately electrically bonded and grounded. This requirement shall apply to paint containers, wash cans, guards, hose connectors, brackets, and any other electrically conductive objects or devices in the area.
Revise 516.10(B)(4) as follows:
(4) Electrostatic Equipment. All electrically conductive objects in the spraying area shall be adequately electrically bonded and grounded. This requirement shall apply to paint containers, wash cans, and any other electrically conductive objects or devices in the area. The equipment shall carry a prominent, permanently installed warning regarding the necessity for this grounding feature.
Revise 516.10(C)(4)(b) as follows:
(b) All electrically conductive objects within the powder-coating area shall be adequately electrically bonded and grounded. The powder-coating equipment shall carry a prominent, permanently installed warning regarding the necessity for grounding these objects.

Substantiation: The term “adequately grounded” is not defined and appears to be in conflict with 3.2.1 of the NEC Style Manual which states, “The NEC shall not contain references or requirements that are unenforceable or vague.” Also, the Panel statement indicates that “Any paint can, wash can, bracket, etc. that was sitting on a grounded concrete floor would be considered grounded but would not likely be adequately grounded.” The definition of “Grounded (Grounding)” in Proposal 5-9 is “Connected to ground or to a conductive body that extends the ground connection.” A paint can “sitting” on a grounded concrete floor would be considered adequately grounded, which is consistent with the terminology used in other spray application, dipping and coating process standards including NFPA 33-2003, Standard for Spray Application Using Flammable or Combustible Materials, NFPA 77-2003, and NFPA 34-2003, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids.
This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accepted” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Bleslainer; Daleep Mohla; Phil Simmons; Christopher Hughes; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr. The following is the minority negative ballot comment by one Task Group member during the Task Group’s results balloting:
“4. Comment (include proposed new wording, or identification of wording to be deleted):
Reject the Panel’s action on 516.10(A)(6), 516.10(B)(4) and 516.10(C)(4)(b) and modify the text as follows:
Revise 516.10(A)(6) as follows:
(6) Bonding Grounding. All electrically conductive objects in the spray area, except those objects required by the process to be at high voltage, shall be adequately ground bonded. This requirement shall apply to paint containers, wash cans, guards, hose connectors, brackets, and any other electrically conductive objects or devices in the area.
Revise 516.10(B)(4) as follows:
(4) Electrostatic Equipment. All electrically conductive objects in the spray area shall be adequately ground bonded. This requirement shall apply to paint containers, wash cans, and any other electrically conductive objects or devices in the area. The equipment shall carry a prominent, permanently installed warning regarding the necessity for this grounding feature.”
Revised 516.10(C)(4)(b) as follows:

(b) All electrically conductive objects within the powder-coating area shall be adequately bonded. The powder-coating equipment shall carry a prominent, permanently installed warning regarding the necessity for bonding these objects.

5. Statement of Problem and Substantiation for Comment:

The term “adequately grounded” is not defined and appears to be in conflict with 3.2.1 of the NEC Style Manual which states, “The NEC shall not contain references or requirements that are unenforceable or vague.”

As indicated in the Panel statement, these sections refer to electrostatic painting operations and thus the goal is to have conductive objects “bonded” and not “grounded.” CMP-5 accepted a revised definition for “Bonding (Bonded)” in Proposal 5-2. The accepted definition reads, “Connected to establish electrical continuity and conductivity.” CMP-5 also accepted a change to the definition of “Grounded” in Proposal 5-9. The accepted definition reads, “Grounded (Grounding) Connected to ground or to a conductive body that extends the ground connection.” The definition of the term “Ground” has been revised in Proposal 5-8 as “The earth.” So, it does not seem Panel 14’s intent is to have the language in these sections mean, “All electrically conductive objects” such as paint containers, wash cans, and any other electrical conductive objects “shall be adequately connected to earth.”

Also, the Panel statement indicates that “Any paint can, wash can, bracket, etc. that was sitting on a grounded concrete floor would be considered grounded but would not likely be adequately grounded.” A paint can “sitting” on a grounded concrete floor would not likely be considered “connected” as required by the definition.

Panel Meeting Action: Accept in Principle

Add a fine print note to each of these three sections to read:

FPN: Criteria for grounding for this purpose can be found in NFPA 33 and NFPA 34. See also NFPA 77.

Panel Meeting Action: Accept in Principle

This revision is necessary to accommodate the addition of extract material from NFPA 101.

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 14-5

Recommendation: Accept proposal.

Substantiation: It is not within the scope of the National Electrical Code project to define the various types of health care facilities that exist within the U.S. This is the responsibility of the T/C on Safety to Life.

Panel Meeting Action: Accept in Principle

Revise Ambulatory Health Care Facility to read as follows:

Ambulatory Health Care Occupancy. A building or portion thereof used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following:

(1) treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;

(2) anesthetics that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;

(3) emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others. [101:3.3.168.1]

Panel Statement: The panel understands that the intent of the submitter is to correlate with the definition from LSC 101. The panel agrees with the submitter.

The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-5 Log #1635 NEC-P15 Final Action: Accept in Principle

TCC Action: The Technical Correlating Committee directs that the FPN following the title of Article 517 be revised to read as follows: “FPN: Rules that are followed by a reference in brackets contain text that has been extracted from NFPA 99-2002, Standard for Health Care Facilities and NFPA 101-2006, Life Safety Code. Only editorial changes were made to the extracted text to make it consistent with this Code.”

This revision is necessary to accommodate the addition of extract material from NFPA 101.

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-6


Substantiation: It is not within the scope of the National Electrical Code project to define the various types of health care facilities that exist within the U.S. This is the responsibility of the T/C on Safety to Life.

Panel Meeting Action: Accept in Principle

Revise ARTICLE 517 HEALTH CARE FACILITIES.

Panel Meeting Action: Accept

Delete the reference to Article 250 in 516.16(A).

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Final Action: Accept

ARTICLE 517 HEALTH CARE FACILITIES

15-2 Log #400 NEC-P15 Final Action: Reject

Submitter: Daniel Leaf, Seneca, SC

Comment on Proposal No: 15-3

Recommendation: Accept the proposal.

Substantiation: Ungrounded circuits may be supplied from an isolating (isolation) transformer with a grounded secondary such as a 2-wire 240 volt circuit from a 120/240 volt secondary which is grounded. The proposal should be judged on merit, not conformance to other standards.

Panel Meeting Action: Reject

Panel Statement: Proposal 15-3 suggests additional language that would expand the definition beyond its current scope. The existing definition includes language: “...and its ungrounded circuit conductors”, which clearly indicates the secondary circuit conductors must be ungrounded.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-3 Log #431 NEC-P15 Final Action: Reject

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 15-5

Recommendation: Accept proposal.

Substantiation: See proposal substantiation. Proposal should be judged on merit not whether it conforms to other standards.

Panel Meeting Action: Reject

Panel Statement: The terms “isolation”, “isolating” and “isolated” are used to state the purpose, performance and condition of the specific equipment and/or system. The terms are clearly understood in their context as used.

It is the intent of the panel to use extracted material whenever possible in order to maintain consistency between documents. In this case, the source document is NFPA 99.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-4 Log #1634 NEC-P15 Final Action: Accept

(517.2)

TCC Action: The Technical Correlating Committee directs that the FPN following the title of Article 517 be revised to read as follows:

“FPN: Rules that are followed by a reference in brackets contain text that has been extracted from NFPA 99-2002, Standard for Health Care Facilities and NFPA 101-2006, Life Safety Code. Only editorial changes were made to the extracted text to make it consistent with this Code.”

This revision is necessary to accommodate the addition of extract material from NFPA 101.

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-6


Substantiation: It is not within the scope of the National Electrical Code project to define the various types of health care facilities that exist within the U.S. This is the responsibility of the T/C on Safety to Life.

Panel Meeting Action: Accept in Principle

Revise Ambulatory Health Care Facility to read as follows:

Ambulatory Health Care Occupancy. A building or portion thereof used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following:

(1) treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;

(2) anesthetics that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;

(3) emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others. [101:3.3.168.1]

Panel Statement: The panel understands that the intent of the submitter is to correlate with the definition from LSC 101. The panel agrees with the submitter.

The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-5 Log #1635 NEC-P15 Final Action: Reject

(517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-6


Substantiation: NFPA Standards Council has written that it wants one definition of a term used in NFPA documents. It is not within the scope of the National Electrical Code project to define the parameters of an anesthetizing location.

Panel Meeting Action: Reject

Panel Statement: The panel action on Proposal 15-1 retains the existing definition for “Anesthetizing Location” contained in NFPA 70. This action is consistent with provisions of the NFPA Glossary of Terms, Section 2.1.2(b) for Secondary Definitions.

NFPA 70, as an international document, should continue to recognize the use of flammable anesthetics.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

TCC Action: The Technical Correlating Committee directs that the FPN following the title of Article 517 be revised to read as follows: “Please note that it is not possible to define the various types of health care facilities that exist within the U.S. This is the responsibility of the T/C on Safety to Life.”

This revision is necessary to accommodate the addition of extract material from NFPA 101.

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-6


Substantiation: It is not within the scope of the National Electrical Code project to define the various types of health care facilities that exist within the U.S. This is the responsibility of the T/C on Safety to Life.

Panel Meeting Action: Accept in Principle

Revise Ambulatory Health Care Facility to read as follows:

Ambulatory Health Care Occupancy. A building or portion thereof used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following:

(1) treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;

(2) anesthetics that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;

(3) emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others. [101:3.3.168.1]

Panel Statement: The panel understands that the intent of the submitter is to correlate with the definition from LSC 101. The panel agrees with the submitter.

The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-5 Log #1635 NEC-P15 Final Action: Accept

(517.2)
Critical Branch. A subsystem of the emergency system consisting of feeders and branch circuits supplying energy to task illumination, special power circuits, and selected receptacles serving areas and functions related to patient care and that are connected to alternate power sources by one or more transfer switches during interruption of normal power source. [99:3.3.26]

Panel Statement: The panel understands that the intent of the submitter is to correlate with the definition from NFPA 99. The panel agrees with the submitter.

The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70. The NFPA Glossary of Terms currently indicates that NFPA 70 is the responsible document for this definition.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-7 Log #1637 NEC-P15 Final Action: Reject (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-9
Substantiation: Conform to NFPA Standards Council policy on one definition for a term. Not within the scope of the National Electrical Code project to define parameters of a critical (patient) care area.
Panel Meeting Action: Reject
Panel Statement: There are sufficient differences between the definitions and, as such, an extract reference is not appropriate. The panel action on Proposal 15-1 retains the existing definition for “Critical Care Area” contained in NFPA 70. This action is consistent with the provisions of NFPA Glossary of Terms, Section 2.1.2(b) for Secondary Definitions.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: SEABUR, III, J.: The proposal should be Accepted in Principle. NFPA 99 should be responsible for this term.

15-8 Log #1638 NEC-P15 Final Action: Accept (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-10
Substantiation: T/C on Safe Use of Electricity in Patient Care Areas of Health Care Facilities created and defined term “electrical life support equipment” in 1980s. Question NFPA Glossary of Terms assignment of responsibility for this term.
Panel Meeting Action: Accept
Panel Statement: The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-9 Log #1639 NEC-P15 Final Action: Reject (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-11
Recommendation: Correlate use of term “Emergency System” in Article 700 with same term as used in Article 517.
Substantiation: Term “emergency system” was created and defined by the T/C on Essential Electrical Systems in the 1960s. Both Article 517 and Article 700 use the term. Article 517 uses the term in the same way that NFPA 99 uses the term. Article 700 has a different meaning for the term, correlation is required.
Panel Meeting Action: Reject
Panel Statement: The term “Emergency System” as applied in Article 517 is not in conflict with use of the term in Article 700. There is correlation between the appropriate parts of each article by means of reference(s) in each to the other.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 11 Negative: 1
Explanation of Negative: SEABUR, III, J.: Correlation of the term “Emergency System” is required by the Technical Correlating Committee. 517.2 and NFPA 99 define this term as it relates to healthcare facilities. 700.1 has a much broader definition.

15-10 Log #1640 NEC-P15 Final Action: Reject (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-12
Substantiation: 1. Term “equipment system” was created and defined by the T/C on Essential Electrical Systems in the 1960s. Both Article 517 and Article 700 use the term, and use the term in the same way. Question NFPA Glossary of Terms assignment of responsibility for this term.
2. Article 700 has a different meaning for the term. Correlation is required.
Panel Meeting Action: Reject
Panel Statement: There are sufficient differences between the definitions and, as such, an extract reference is not appropriate. Use of the defined term “Equipment System” is unique to Article 517 in NFPA 70. It is not used in Article 700 as a defined system or portion of a system. Correlation is not needed.

The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-11 Log #1641 NEC-P15 Final Action: Accept in Principle (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-13
Substantiation: Term “essential electrical system” was originated in the 1960s by the T/C on Essential Electrical Systems (NFPA 76A) when it established requirements for essential electrical systems in health care facilities. Question NFPA Glossary of Terms assignment of responsibility for this term.
Panel Meeting Action: Accept
Panel Statement: Revise Essential Electrical System to read as follows: Essential Electrical System. A system comprised of alternate sources of power and all connected distribution systems and ancillary equipment, designed to ensure continuity of electrical power to designated areas and functions of a health care facility during disruption of normal power sources, and also to minimize disruption within the internal wiring system. [99 3.3.44]
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-12 Log #1642 NEC-P15 Final Action: Reject (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-14
Substantiation: T/C on Safe Use of Inhalation Anesthetics created and defined the term “flammable anesthetizing location” in 1930s. Question NFPA Glossary of Terms assignment of responsibility for this term.
Panel Meeting Action: Reject
Panel Statement: This definition is not in the body of NFPA 99. The submitter references material contained in an informative annex and since the annex is not mandatory text, an extract is not appropriate.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-13 Log #1643 NEC-P15 Final Action: Accept in Principle (517.2)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-15
Substantiation: T/C on Safe Use of Electricity in Patient Care Areas of Health Care Facilities created and defined term “general care area” in 1970s. Term was revised for 2005 edition of NFPA 99. Not within the scope of the National Electrical Code project to determine parameters of a general (patient) care area.
Panel Meeting Action: Accept in Principle
Revise General Care Areas to read as follows:
General Care Areas. Patient bedrooms, examining rooms, treatment rooms, clinics, and similar areas in which it is intended that the patient will come in contact with ordinary appliances such as a nurse-call system, electric beds, examining lamps, telephones, and entertainment devices. [99:3.3.138.2]

Panel Statement: The panel understands that the intent of the submitter is to correlate with the definition from NFPA 99. The panel agrees with the submitter.
The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-14 Log #1644 NEC-P15 Final Action: Reject
(517.2)
Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-17
Substantiation: 1. Standards Council has stated that it wants one definition for a term used in NFPA documents. There should not be differences in definitions between the same term used by two NFPA documents (per NFPA Standards Council).
2. It is not within the scope of the National Electrical Code project to define parameters of a health care facility.
Panel Meeting Action: Reject
Panel Statement: There are sufficient differences between the definitions and, as such, an extract reference is not appropriate.
The panel action on Proposal 15-1 retains the existing definition for “Critical Care Area” contained in NFPA 70. This action is consistent with the provisions of NFPA Glossary of Terms, Section 2.1.2(b) for Secondary Definitions.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-15 Log #1645 NEC-P15 Final Action: Accept
(517.2)
TCC Action: The Technical Correlating Committee understands that the panel action results in “[NFPA 99: 3.3.96)” being added to the definition of “Life Safety Branch”.
Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-19
Substantiation: Term “life safety branch” originated in the 1960s by the T/C on Essential Electrical Systems (NFPA 76A) when it established requirements for essential electrical systems in health care facilities.
Panel Meeting Action: Accept
Panel Statement: The panel requests the Standards Council to review and clarify the ownership of definitions common to NFPA 99, LSC 101 and NFPA 70.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-16 Log #1646 NEC-P15 Final Action: Accept in Principle in Part
(517.2)
Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-22
Recommendation: Accept in Part Proposal 15-22. Revise definition of “patient care area” as defined by Mr. Erickson in his negative vote.
Substantiation: Standards Council has stated that it wants one definition for a term used in NFPA documents. Not within the scope of the National Electrical Code project to define parameters of a patient care area.
Panel Meeting Action: Accept in Principle in Part
Revise Patient Care Area to read as follows:
Patient Care Area. Any portion of a health care facility wherein patients are intended to be examined or treated. Areas of a health care facility in which patient care is administrated are classified as general care areas or critical care areas, either of which may be classified as a wet location. The governing body of the facility designates these areas in accordance with the type of patient care anticipated and with the following definitions of the area classification.
FPN: Business offices, corridors, lounges, day rooms, dining rooms, or similar areas typically are not classified as patient care areas.
Revise Wet Locations to read as follows:
Wet Locations. Those spaces within patient care areas where a procedure is performed and that are normally subject to wet conditions while patients are present. These include standing fluids on the floor or draining of the work area, either of which condition is intimate to the patient or staff. Routine housekeeping procedures and incidental spillage of liquids do not define a wet location.
Panel Statement: The panel accepts the submitter’s recommendation pertaining to the definition of patient care area.
The panel rejects the submitter’s recommendation to remove reference to governing bodies.

The panel rejects the changes to the definition to wet locations and provides alternate text that better defines the location. This text addresses the submitter’s desire to better correlate with NFPA 99.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-17 Log #2329 NEC-P15 Final Action: Accept in Principle
(517.2)
Submitter: Marcus Sampson, Lysistrata Electric
Comment on Proposal No: 15-4
Recommendation: The panel should review the merits of this proposal.
The term “Wet Locations” should be change to “Wet Procedure Areas” to clearly differentiate the condition.
Substantiation: While inspectors and installers familiar with the long-time NEC classifications of patient care areas in health care facilities (may) understand the distinction between “Location, Wet” as defined in Article 100 and “Wet Locations” as used in Article 517, adopting this proposal eliminates an unnecessarily subtle nuance.
Code requirements should not be esoteric.
Users should find clear, readily understood terms that are used consistently throughout the document. This minor change would result in a better understanding of the meaning of the term. For consistency and clarity, “Patient Care Areas” should be divided into three other types of AREAS - not two types of “areas” and one type of “location.”
517.18 General Care Areas
517.19 Critical Care Areas
517.20 Wet Procedure Areas
While the panel’s response indicates that the change would not comply with the NEC Style Manual for extracted text, Article 517 is not made up entirely of extractions from NFPA 99. The submitter did indicate that this proposal was also sent to that committee.
Panel Meeting Action: Accept in Principle
Change the title of “Wet Locations” to “Wet Procedure Locations”.
Panel Statement: The panel agrees with the submitter to change the title of the definition. The panel replaces the word “areas” with “locations” because it is a location within an area.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-17a Log #CC1500 NEC-P15 Final Action: Accept
(517.2, 517.20, 517.20(A) and 517.60)
Submitter: Code-Making Panel 15,
Comment on Proposal No: 15-4
Recommendation: Change the terms “wet location” to “wet procedure location” and “wet locations” to “wet procedure locations” in Section 517.2, 517.20, 517.20(A) and 517.60.
Substantiation: This is required as the title was changed. See panel action and statement in Comment 15-17.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-18 Log #1257 NEC-P15 Final Action: Accept
(517.13(B) Exception No. 1, 517.18(B), 517.19(B)(2), and 517.19(D))
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 15-2
Recommendation: Continue to accept the following portions of the TCC Grounding and Bonding Task Group proposal 15-2 as modified and revised by the actions of CMP-15 for which the TCC Grounding and Bonding Task Group agrees with the CMP-15 editorial revisions to the Sections 517.13(B) Exception No. 1, 517.18(B), 517.19(B)(2), and 517.19(D).
Substantiation: TCC Grounding and Bonding Task Group understands the revisions to the proposal have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives.
This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

70-324
The panel statement suggests that most generators are small and, therefore, ground faults are the most common form of faults in a operating electrical system. There should be some valid point at which ground-fault protection is needed. It is true that small alternate power sources should have ground-fault detection, but it does not prohibit the use of ground-fault protection.

The panel holds both Proposal 15-29 and Comment 15-21. The panel contents that this issue requires further review, study and discussion to understand the complexity in terms of coordination and protection (including energy produced by standby generator). The panel cannot adequately address these issues at this time and therefore recommends to place the proposal and comment on hold and create a task group to research further.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
2. Closing a transfer switch or a generator into a ground fault presents the real possibility of damaging the transfer switch, or generator, or both, thus potentially decreasing system reliability.

As Mr. Wiseman pointed out in his negative comment, the panel statement is incorrect. The proposed deletion does not establish a conflict. The conflict is in the existing language since the additional level of ground-fault protection is prohibited in portions of the essential electrical system that could be fed from the alternate power source, while NEC 700 actually permits ground-fault protection at the source. There is no substantiation indicating a need to amend NEC Article 700 for NEC 517 installations nor is there substantiation that disabling a properly installed ground-fault protection system will enhance the reliability of the system.

The panel statement suggests that most generators are small and therefore the risk of burn-down is not an issue. That statement has no relevance to this discussion since the requirement for ground-fault protection is triggered by the size of the service disconnect in 230.95 or the feeder in 215.10. Therefore, the smaller generators which do not include a feeder disconnect rated 1000A or greater are not required to have ground-fault protection, and this revision would have no impact on them.

There has been no evidence presented or substantiation presented in the panel statement that supports rejecting this proposal.

Panel Meeting Action: Hold

Panel Statement: The panel holds both Proposal 15-29 and Comment 15-21.

The panel contents that this issue requires further review, study and discussion to understand the complexity in terms of coordination and protection (including energy produced by standby generator). The panel cannot adequately address these issues at this time and therefore recommends to place the proposal and comment on hold and create a task group to research further.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-23 Log #2051 NEC-P15 Final Action: Hold
(517.17(B)(2))

Submitter: Hugh O. Nash, Jr., Nash Lipsy Burch
Comment on Proposal No: 15-29
Recommendation: Continue to reject 15-29 which applies to 517.17 Ground-Fault Protection. Add the following sentence to 517.17(B)(2):

For solidly grounded wave-emergency systems of more than 150 volts to ground and circuit-protective devices rated 1000 or more, refer to 700.7(D).

(Note: The intent is to refer to the language in the 2005 edition. If this wording is deleted, the entire text of 517.17(B)(2) shall be added here.)

Substantiation: Regardless of the size of the alternate source, ground-fault interruption on the alternate source overcurrent device can cause interruption of the alternate source feed to health care facility essential system loads. Automatic disconnecting should not be provided under any circumstances. 517.17(B) states, "The additional levels of ground-fault protection shall not be installed as follows: (1) On the load side of the essential electrical system transfer switch, (2) Between the onsite generating unit as described in 517.35(B) and the essential electrical system transfer switch(es). For many years, 517.17 warned against placing GFP interruption between the alternate source and the transfer switch(es). This warning has now become a prohibition. There are documented instances where GFP interrupted the normal source and the alternate source, leaving critical care areas without normal or alternate power.

Panel Meeting Action: Hold

Panel Statement: The panel holds both Proposal 15-29 and Comment 15-21.

The panel contents that this issue requires further review, study and discussion to understand the complexity in terms of coordination and protection (including energy produced by standby generator). The panel cannot adequately address these issues at this time and therefore recommends to place the proposal and comment on hold and create a task group to research further.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-24 Log #831 NEC-P15 Final Action: Reject
(517.18(B))

Submitter: Daniel Eagle, Sacred Heart Medical Center
Comment on Proposal No: 5-34
Recommendation: The NEC job is to make sure electrical equipment is installed safely. Its job is not to give us a false sense of security. If the indicator light burns out on the outlet, and the hospital staff panic and unplug a working outlet. The patient is being put into an unknown risk. I am sure, the hospital staff is trained to verify the systems that they are plugging in are working correctly. The manufacture of the outlets will say the lights will burn for hundreds or hours without a problem. I have seen the cleaning process short out indicator lights on equipment before.

Substantiation: The NEC job is to make sure electrical equipment is installed safely. Its job is not to give us a false sense of security. If the indicator light burns out on the outlet, and the hospital staff panic and unplug a working outlet. The patient is being put into an unknown risk. I am sure, the hospital staff is trained to verify the systems that they are plugging in are working correctly. The manufacture of the outlets will say the lights will burn for hundreds or hours without a problem. I have seen the cleaning process short out indicator lights on equipment before.

Panel Meeting Action: Reject

Panel Statement: No recommended text is provided with the comment as required by 4-3.3(c) of the Regulations Governing Committee Projects.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-26 Log #2163 NEC-P15 Final Action: Accept
(517.18(B) and 517.19 (B) (2))

Submitter: Susan B. McLaughlin, SMB Consulting, Ltd./ Rep. NFPA Health Care Section Executive Board

Comment on Proposal No: 15-34
Recommendation: Reject this Proposal.

Substantiation: In reviewing this new requirement, the NFPA Health Care Section Executive Board is of the opinion that the need for indicator lights on receptacles should not become a minimum standard. Panel 15 appears to have reacted to a proposal based on one reported incident. Is the fix a mechanical one or is there a better way to resolve the issue with better staff training, panel schedules, etc.? All newly installed critical care outlets are required to have the feeder disconnect rated 1000A or greater. This can be quickly determined if the outlets are on the same circuit. If a hospital wants to install devices with illuminated faces or indicator lights, they are permitted to do so as this exceeds the Code. A code is a set of standards that shall have substantial justification behind the need and should not be changed as a result of a few isolated instances where the staff may not have been properly trained on the environment in which they are working.

Panel Meeting Action: Accept

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-27 Log #2103 NEC-P15 Final Action: Accept
(517.18(B) and 517.19 (B) (2))


Comment on Proposal No: 15-34
Recommendation: Reject this proposal.

Substantiation: In reviewing this new requirement, it is the opinion of the Washington State Society for Healthcare Engineering that the need for indicator lights on receptacles should not become a minimum standard. One reported incident should not justify a new code without careful consideration and a significant review of incident locations facilities emergency preparation and response. Most hospitals have tied critical equipment into UPS sources that will initiate alarms when activated allowing for a period of time to react without jeopardizing patient safety. Best practices would stipulate panel labeling at the outlet and multiple breakers to feed one room to offset just this issue. Code revision based on this incident will set a precedent that would make code revisions reactive and not proactive raising the already high costs to build and operate our facilities. The primary responsibility of healthcare engineering is to ensure the environmental health and safety of the patients, facilities, and staff we serve. If the code recommendation could not be off set by effective emergency plans, staff training, and following existing code standards, I would support this code. A proactive review of the incident should show one of these tree elements were missing.

Panel Meeting Action: Accept

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-25 Log #264 NEC-P15 Final Action: Accept
(517.18(B) and 517.19(B)(2))

Submitter: Stanley J. Foltz, Morse Electric, Inc.

Comment on Proposal No: 15-34
Recommendation: Delete the text as amended by the CMP.

Substantiation: I am in agreement with all of the negative comments from the CMP-15 members.

Panel Meeting Action: Accept

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

70-326
15-28 Log #795 NEC-P15  
(517.18(B) and 517.19(B)(2))  
Submitter: Douglas S. Erickson, American Society for Healthcare Engineering (ASHE)  
Comment on Proposal No: 15-34  
Recommendation: Reject this proposal.  
Substantiation: In reviewing this new requirement, the American Society for Healthcare Engineering is of the opinion that the need for indicator lights on receptacles should not become a minimum standard. Panel 15 appears to have reacted to a proposal based on one reported incident. Is the fix a mechanical one or is there a better way to resolve the issue with better staff training, panel schedules, etc.? All newly installed critical care outlets are required to have the circuit number labeled on the front so that staff can quickly determine if the outlets are on the same circuit. If a hospital wants to install devices with illuminated faces or indicator lights, they are permitted to do so as this exceeds the Code. A code is a set of standards that shall have substantial justification behind the need and should not be changed as a result of a few isolated instances where the staff may not have been properly trained on the environment in which they are working.  
Panel Meeting Action: Accept  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12  
Final Action: Accept  
(517.18(B) and 517.19(B)(2))  
15-32 Log #2148 NEC-P15  
(517.18(B) and 517.19(B)(2))  
Submitter: Matthew Campbell, Washington State Department of Health: Construction Review Services  
Comment on Proposal No: 15-34  
Recommendation: Reject this Proposal.  
Substantiation: In reviewing this new requirement, it is our opinion that the need for indicator lights in the receptacles as should not become a minimum standard. Panel 15 appears to have reacted to a proposal based on one reported incident. Is the fix a mechanical one or is there a better way to resolve the issue with better staff training, panel schedules, etc. All newly installed critical care outlets are required to have the circuit number labeled on the front so that staff can quickly determine if the outlets are on the same circuit. If a hospital wants to install devices with illuminated faces or indicator lights, they are permitted to do so as this exceeds the Code. A code is a set of standards that shall have substantial justification behind the need and should not be changed as a result of a few isolated instances where the staff may not have been properly trained on the environment in which they are working.  
Panel Meeting Action: Accept  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12  
Final Action: Accept  
(517.18(B) and 517.19(B)(2))  
15-33 Log #700 NEC-P15  
(517.26)  
TCC Action: See the Technical Correlating Committee action on Comment 15-35.  
Submitter: Michael J. Johnston, Plano, TX  
Comment on Proposal No: 15-43  
Recommendation: This proposal should be rejected. Restore the language in this section to the text in the 2005 NEC as follows:  
15.26 Application of Other Articles. The essential electrical system shall meet the requirements of Article 700, except as amended by Article 517.  
Substantiation: Nothing is gained by this revision as proposed. In fact, much is lost as a result of this action. The consequences of accepting this change are far reaching as indicated in the statement to the negative by Mr. Morgans representing Electrical Code Enforcement. Another significant consequence of this change is that selective coordination of overcurrent protective devices used in emergency systems will be lost for the critical care branch, which, in a hospital, is an extremely important part of the emergency system, for obvious reasons. The proposal reduces current requirements without adequate substantiation. The submitter correctly made the point about Article 700 being applicable to the life safety branch, but removing the requirement for selective coordination required by 700.27 goes against the fundamental concepts of NFPA 99 and its objectives to maintain continuity of power for patient care electrical systems, especially the critical care branch. I strongly suggest reconsidering the original action on this proposal and its intended or unintended consequences.  
Panel Meeting Action: Reject  
Panel Statement: The panel upholds its position on Proposal 15-43. The life safety branch of the health care facility is comparable to the emergency system of commercial (and other) building types, since both provide power for life safety systems. The critical branch of the health care facility serves patient care related circuits and equipment, and thus it is not appropriate to apply Article 700.  
Emergency power supply systems need to be governed by one entity. The panel requests the Standards Council and the TCC to review scopes and charges of NFPA 99, NFPA 110, Articles 517 and 700 as it pertains to emergency power systems.  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 8 Negative: 4  
Explanation of Negative:  
MORGAN, E.: I strongly disagree with the panel action and statement on this comment. The original Proposal 15-43 removes some extremely important installation requirements from the critical branch of the emergency system. This action effectively removes requirements such as 700.3 Equipment approval for use on emergency systems; 700.4 Acceptance test, maintenance and periodic testing of the critical branch; 700.9(A) Identification of boxes and enclosures for critical branch feeders and circuits; 700.9(D) Fire Protection of feeders in buildings over 75 ft in height; 700.12(B)(5) Auxiliary power supply provisions where the generator set may require more than 10 seconds to develop full power; and 700.27 Selective coordination of overcurrent devices. These all have a significant impact on the safe design, installation and inspection of critical branch systems. Good design alone cannot be enforced by an Authority Having Jurisdiction if the requirements are not part of Article 517, or incorporated by reference to Article 700.  
The Panel Statement fails to acknowledge the primary reason for this change is to avoid the requirement for selective coordination of the critical branch overcurrent devices. This appears to be a contradiction of the actions of Panels 13 and 20. In Article 700 and new Article 585, those Panels each reaffirmed the
necessity and practicability of selective coordination to minimize and localize power outage when there is a short circuit or overcurrent. The critical branch of a health care facility emergency system must have continuity of operation as one of its' highest priorities. Removing the Article 700 requirements has no apparent benefit and will cost saving. If the Panel's intent was to avoid the requirement for selective coordination (and I object to that concept), then at a minimum the other installation requirements as outlined in the above paragraph should be incorporated into Article 517.

It should be noted that the editors of the NEC 2005 Handbook © consider the requirements of Article 700 to apply to the critical branch of the essential electrical system. Quoting from the commentary following the definition in 517.2: “Emergency System. Emergency systems in occupancies other than health care are installed primarily for life safety and building evacuation. The emergency system equipment is life safety systems as well as maintaining power for critical patient care supplies.”

The Panel statement requests “the Standards Council and the TCC to review scopes and charges of NFPA 99, NFPA 110, Articles 517 and 700 as it pertains to emergency systems.” If this request is accepted, I would also ask that consideration be given to the apparent discrepancy between Article 517 for emergency systems and Article 517 emergency systems that would be created by this change.

TALKA, D.: See my explanation of negative vote on Comment 15-35.

WHITE, A.: See my explanation of negative vote on Comment 15-35.

WISEMAN, J.: NEMA disagrees with the panel action. The panel action results in the removal of the critical branch from the requirements for emergency systems found in Article 700. The critical branch includes task illumination and selected receptacles for critical care areas, isolated power systems, patient care areas, nurse call systems, blood banks, bone banks, tissue banks, telephone equipment rooms, and task illumination for cardiac test labs, coronary care units, emergency rooms, and intensive care units.

15-34 Log #1352 NEC-P15  Final Action: Reject

Submitter: Tim Janof, Sparling

Comment on Proposal No: 15-43
Recommendation: Revise text to read as follows:

517.26 Application of Other Articles. The life safety branch of the emergency systems found in Articles 517 and 517.30(B)(2) shall meet the requirements of Article 700, except as amended by Article 517. The critical branch shall not be required to meet the requirements of Article 700. The equipment branch shall not be required to meet the requirements of Article 700.

Substantiation: I support the panel’s action on Article 517.26 and propose to further clarify that the Equipment System is not required to comply with Article 701. I support the notion that the Life Safety branch is analogous to the Article 700 branch, and I believe the same principle should be extended to the Equipment Branch, in that it is analogous to Article 701 branch. While I do not support the requirement for selective coordination in Articles 700 and 701, if they are to remain in the Code, limiting the requirement to the Life Safety branch in healthcare facilities is sensible.

When selective coordination is considered, most people first envision a patient on an operating room table. This is perhaps the most emotionally charged situation to witnesses and those who support the requirement for selective coordination. When one examines this situation, however, one finds that the requirement for selective coordination is difficult to justify. UL, Article 517, and NFPA 99 already have provisions that result in safe health care facilities:

- UL requires that critical medical equipment have integral batteries. Heart-lung machines, for example, typically have 1-hour batteries, which is plenty of time for hospital personnel to find and turn on a breaker that may have tripped inadvertently.
- The NEC requires redundancy in electrical systems in healthcare facilities. For example, facilities with critical care functions are required to have a backup emergency power source such as a generator or battery. The NEC also requires that power be provided from two separate power branches to each patient care area, including critical care areas and operating rooms. Power must be fed from both a normal and emergency power branch, or from two separate transfer switches. If there were an outage in one branch of power, the other branch would have the advantage of being the only source of emergency power. A power source would not be available involve some sort of catastrophic event, such as an emergency generator failure, fire, or earthquake, which the requirement for selective coordination would not prevent. The NEC’s power system redundancy requirements have an excellent track record of supporting the healthcare environment.
- NFPA 99 requires that operating rooms and other anesthetizing locations have lighting with integral 90-minute battery back-up.

If there were evidence that a lack of selective coordination has resulted in injury or death, I would agree on the premise that we would fully support the requirement for selective coordination. But given the lack of any such case history, I can see no justification for requiring that owners pay the additional cost and sacrifice the additional space for a system that will not result in any patient benefit. Healthcare capital development budgets are limited and money not used for optimal electrical reliability benefits can be directly used for additional beds or medical equipment. I am now aware of any data that demonstrates that lives have been lost or that patients were injured due to a lack of selective coordination in healthcare facilities.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree with submitter’s substantiation relative to UL requirements that critical medical equipment have integral batteries.

The equipment branch should not be excluded from the requirements of Article 700.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-35 Log #2260 NEC-P15  Final Action: Reject

"TCC Action: The Technical Correlating Committee directs that this comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative. In addition, the Technical Correlating Committee directs that Proposal 15-43 be reported as “Reject” since the panel no longer appears to have consensus on the issue.

Submitter: James Wiseman, Schneider Electric / Square D

Comment on Proposal No: 15-43
Recommendation: The panel should reconsider the action taken on this proposal, Accept in Principle, and relocate 517.26 to become 517.3, reading as follows:

“3 Other Articles. The life safety branch of the emergency system shall meet the requirements of Article 700, except as amended by Article 701. The critical branch shall not be required to meet the requirements of Article 700.

Substantiation: We support the attempt at clarifying the portions of the health care electrical system to which the requirements of Article 700 apply. But the attempt did not go quite far enough. For many years, there has been confusion because Article 517 uses the “emergency” term differently than it is used in Article 700. Several attempts have been made, starting with the 1999 NEC edition, to minimize the confusion and still comply with rules for referencing other NEC Articles. Each has returned some portion of the problem.

The Recommendation and Substantiation in Proposal 15-43 are entirely consistent with the stance taken by the CMP (CMP-17, at that time) during their 2002 cycle. The ROC for that cycle, in Log #206 (Comment 17-15 on Proposal 17-10 covering the definition of Emergency System in 517.3) includes the following sentence as a part of the Panel Statement: “The Panel’s intent is that Article 700 apply only to the ‘Life safety branch.’” Unfortunately, they took no further action within Article 517 to clear up the confusion for items such as the sizing of generators or the number of transfer switches.

The problem with leaving 51.26 as it is proposed in Proposal 15-43 is that, due to 51.26 being under Part III of Article 517, it leaves the “Equipment System” branch in question. Since Part III covers Essential Electrical Systems, it addresses not only the “Emergency System” but also the “Equipment System.” If the section is to stay as 51.26, the last sentence should be changed to read “Neither the critical branch nor the equipment system shall be required to meet the requirements of Article 700.” Moving the section to become 51.3 not only eliminates this confusion, but also matches Article 517 with other Articles in using the 3 number for “Other Articles”.

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 5
Explanation of Negative:}

MORGAN, E.: I strongly disagree with the Panel action on this proposal. There is not sufficient substantiation in either Proposal 15-43 or Comment 15-35 to justify such a change. Throughout NFPA 99 and NEC Article 517, the critical branch is considered an inseparable part of the emergency system. By definition, the critical branch serves such important functions as task illumination and selected power circuits related to patient care. A more complete list of the locations served by these circuits is in NFPA 99, Section 4.4.2.2.2.3. It includes locations such as coronary care, intensive care, postoperative recovery rooms, hemodialysis rooms and emergency rooms.

Removal of the requirement to comply with Article 700 is more than an editorial change. It would literally remove requirements such as: Identification of boxes, enclosures and panels as part of the emergency system (700.9); and the requirement for audible and visual signals for the alternate power source (700.19), and the periodic testing required by 700.44.

Removing the critical branch from requirements of Article 700 may also be mistakenly seen by some designers and installers of smaller facilities as eliminating the requirements for emergency systems in 517, such as separation from other circuits, and mechanical protection.

SHELLY, B.: The critical branch, as defined by Article 517, is a subsystem of the emergency system and therefore, part of the essential electrical system (Article 517.30(D)(2)). The assurance of these systems to be reliable shall remain within the components of Article 700 for the proper performance, maintenance and testing. The Proposal 15-43 should be rejected.

TALKA, D.: The panel debated long and hard on this item due to the significance of the result of the action as well as its controversial nature. One thing the panel agreed on was that there needs to be a clear path established regarding which documents owns the responsibility of the involved part of the code, that is NFPA 70, NFPA 99, NFPA 101, etc. Until such time as that responsibility has been made clear, it is desirable to take action on this significant proposed code revision. Once the responsibility has been confirmed, this comment will take the other comments related to this item and follow suit. Changing the NEC now allows the risk of creating more confusion and setting the stage for years of unintended actions in design and installations of and within healthcare facilities.

70-328
WHITE, A.: As the phrase implies, the critical branch of a health care facilities emergency electrical system provides service to critical patient care areas and functions. Removing the provisions of Article 700 does nothing to improve the performance of the critical branch. Some of these important provisions include:

- Testing (acceptance, load and operational)
- Battery Maintenance
- Selective Coordination
- Transfer Switch Specifications
- Fuel Supply Specifications
- Signaling (battery carrying load, nonfunctioning battery charger, ground fault)
- Emergency Illumination
- Emergency Receptacles
- Physical Separation of Normal and Critical Circuits
- Identification (circuit, box, enclosure, panel)

Removing the requirements of Article 700 potentially undermines this critically important system.

WISEMAN, J.: NEMA disagrees with the panel action. The panel action results in the removal of the critical branch from the requirements for emergency systems found in Article 700. The critical branch includes task illumination and selected receptacles for critical care areas, isolated power systems, patient care areas, nurse call systems, blood banks, bone banks, tissue banks, telephone equipment rooms, and task illumination for cardiac test labs, coronary care units, emergency rooms, and intensive care units.

15-36 Log #1647 NEC-P15 Final Action: Reject

(517.30(B)(4))

TCC Action: See the Technical Correlating Committee action on Comment 15-35.

Submitter: Eugene E. Morgan, Clakamas County, Building Codes Division

Comment on Proposal No: 15-43

Recommendation: The Panel 15 should reconsider its action. Proposal 15-43 should be rejected, leaving existing text as is.

Substantiation: Throughout NFPA 99 and NEC Article 517, the critical branch is considered an inseparable part of the emergency system. By definition, the critical branch serves such important functions as task illumination, special power circuits, and selected receptacles related to patient care. A more complete list of locations served by those circuits is in NFPA 99, 4.4.2.2.2.3. It includes locations such as coronary care, intensive care, postoperative recovery rooms, hemodialysis rooms and emergency rooms.

Removing the requirements to comply with Article 700 is more than an editorial change. It would literally remove requirements such as: Identification of boxes, enclosures and panels as part of the emergency system (700.9); the requirement for audible and visual signals for the alternate power source (700.7); and the periodic testing required by 700.4.

Removing the requirements of Article 700 from the critical branch may be mistakenly seen by some designers and installers of smaller facilities as eliminating the requirements for emergency systems in Article 517; such as separation from other circuits, and mechanical protection.

The only apparent reason for removing the critical branch from the requirements of Article 700 would be a possible cost saving, which in my view, does not justify the change. The critical branch should remain as a recognizable, integral part of the emergency system.

Panel Meeting Action: Reject

Panel Statement: The panel notes the print line is incorrect; it should be 517.26.

The panel upholds its position on Proposal 15-43. The life safety branch of the health care facility is comparable to the emergency system of commercial (and other) building types, since both provide power for life safety systems. The critical branch of the health care facility includes task illumination and selected receptacles for critical care areas, isolated power systems, patient care areas, nurse call systems, blood banks, bone banks, tissue banks, telephone equipment rooms, and task illumination for cardiac test labs, coronary care units, emergency rooms, and intensive care units.

As noted in my negative vote on Comment 15-33, the reason for the original proposal is to avoid selective coordination of critical branch circuit overcurrent devices as required by Section 700.27. The effort to avoid this requirement seems to be in conflict with action taken by Panels 13 and 20, in their actions on Articles 700 and the new Article 585.

The panel statement requests “the Standards Council and the TCC to review scopes and charges of NFPA 99, NFPA 110, Articles 517 and 700 as it pertains to emergency systems.” If this request is accepted, I would also ask that consideration be given to the apparent discrepancy between Article 700 emergency systems and Article 517 emergency systems that would be created by this change.

WHITE, A.: See my explanation of negative vote on Comment 15-35.

WISEMAN, J.: NEMA disagrees with the panel action. The panel action results in the removal of the critical branch from the requirements for emergency systems found in Article 700. The critical branch includes task illumination and selected receptacles for critical care areas, isolated power systems, patient care areas, nurse call systems, blood banks, bone banks, tissue banks, telephone equipment rooms, and task illumination for cardiac test labs, coronary care units, emergency rooms, and intensive care units.

15-37 Log #1386 NEC-P15 Final Action: Accept in Principle

(517.30(C)(3))

Submitter: William Wagner, Certification Solutions

Comment on Proposal No: 15-57

Recommendation: This Proposal should continue to be Accepted as follows:

1. Nonflexible metal raceways, Type MI cable, or Schedule 80 rigid nonmetallic PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.
2. Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 rigid or Schedule 80 dimensions is rigid PVC conduit. As each of the rigid nonmetallic conduit Articles require the conduit to be listed, this revision would not inadvertently eliminate any other conduit type. Additionally, with the renaming of Article 352 as a result of panel action on Proposal 8-53, this revision would help to clarify where the applicable requirements are located. Therefore, the references in 517.30(C)(3) should be revised as noted above.

Panel Meeting Action: Accept in Principle

Change 517.30(C)(3) to read as follows:

1. Nonflexible metal raceways, Type MI cable, or Schedule 80 rigid nonmetallic PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.
2. Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 rigid or Schedule 80 dimensions is rigid PVC conduit. As each of the rigid nonmetallic conduit Articles require the conduit to be listed, this revision would not inadvertently eliminate any other conduit type.

Panel Statement: This correlates with action on Comment 15-41.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-38 Log #1648 NEC-P15 Final Action: Reject

(517.30(C)(3))

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-53


Substantiation: NFPA 99, section 4.4.2.2.4.4 is only stating performance criteria for the emergency system wiring (i.e., some mechanical protection in raceway), but referencing NFPA 70 for the installation requirements as to what type of wiring protection can be used.
Panel Meeting Action: Reject
Panel Statement: Mechanical protection of the emergency system is an installation standard of NFPA 70, not a performance criteria. NFPA 99 contains performance criteria, and correctly contains the reference to NFPA 70, rather than the reverse as the comment suggests.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-39 Log #2045 NEC-P15 Final Action: Hold
(517.30(C)(3))

Submitter: Phil Simmons, National Armored Cable Manufacturers

Comment on Proposal No: 15-54
Recommendation: Revise 517.30(C)(3) as follows:
(3) Mechanical Protection of the Emergency System. The wiring of the emergency system in hospitals shall be mechanically protected. Where installed as branch circuits in patient care areas, the installation shall comply with the requirements of 517.13(A) and 517.13(B). The following wiring methods shall be permitted:
1. Nonflexible metal raceways, Tpe MI cable, or Schedule 80 rigid PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.
2. Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 rigid PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.
3. Listed flexible metal raceways and listed metal-sheathed cables, assemblies in any of the following:
   a. Where used in listed prefabricated medical headwalls
   b. In listed office furnishings
   c. Where fished into existing walls or ceilings, not otherwise accessible and not subjected to damage
   d. Where necessary for flexible connection to equipment.
4. Flexible power cords of appliances or other utilization equipment connected to the emergency system.
5. Secondary circuits of Class 2 or Class 3 communication or signaling systems with or without raceways.

The UL Fact-Finding Report on Nail Penetration of Types AC and MC Cable
It should be noted that items (3)(1) and (3)(2) in the list of accepted uses code cycle dealing with original Proposal 15-54.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider and correlate with the action on Proposal 8-53.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-40 Log #147 NEC-P15 Final Action: Accept
(517.30(C)(3)(4) and 517.30(C)(3)(2))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 15-57
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 8-53. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider and correlate with the action on Proposal 8-53.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-41 Log #359 NEC-P15 Final Action: Accept
(517.30(C)(3)(4) and 517.30(C)(3)(2))

Submitter: Code-Making Panel 8,

Comment on Proposal No: 15-57
Recommendation: CMP-8 recommends that CMP-15 accept this proposal in principle with the revised text:
1. Nonflexible metal raceways, Type MI cable, or Schedule 80 rigid PVC conduit raceways shall not be used for branch circuits that supply patient care areas.
2. Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 rigid nonmetallic PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.

Substantiation: CMP-8 recommends that CMP-15 Accept in Principle Proposal 15-57 with the proposed revised wording. The word “rigid” was also deleted in addition to “nonmetallic” to correlate with the action taken by CMP-8 on Proposal 8-53. This comment has been balloted through CMP-8 with the following ballot results:
12 Eligible to Vote
11 Affirmative
1 Negative
Mr. J. Dabe voted negatively stating: "CMP-8 recommends that CMP-15 reconsider this proposal and Accept in Principle. CMP-15 should add RTRC to the wiring methods in both (1) and (2)."
Mr. R. Loyd voted affirmatively stating: "Proposal 15-57 was to Accept. I agree with Mr. Burns’ recommendation to revise the panel action.”

Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-42 Log #1649 NEC-P15 Final Action: Reject
(517.32(H) (New) )

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-62
Substantiation: Responsibility for what systems or equipment is to be connected to the Life Safety Branch is Health Care Facilities project. If wording is not clear, proposal should be submitted to NFPA 99 to clarify.

Panel Meeting Action: Reject
Panel Statement: As stated in the action on Proposal 15-62, it is unclear what additional functions of the fire alarm combination system is intended in NFPA 99:4.4.2.2.2(8). Connection of fire alarm to the life safety branch is already covered under NFPA 70, 517.32(C)(1).
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-43 Log #1650 NEC-P15 Final Action: Reject
(517.32(H) (New) )

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-63
Substantiation: Proposal is outside the scope of the National Electrical Code project. Responsibility of what equipment is to be connected to the Life Safety Branch is the T/C on Electrical Systems of the Health Care Facility Project. Proposal should be submitted to NFPA 99.
Panel Meeting Action: Reject
Panel Statement: The option of connecting control systems and accessories for life safety system operation is a design function that should be permitted, whether it is contained in NFPA 99 text or not.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-44 Log #1651 NEC-P15
(Final Action: Reject
(517.32(b)(New))

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-64
Recommendation: Reject Proposal 15-64.
Substantiation: Proposal is outside the scope of the National Electrical Code project. Responsibility of what equipment is to be connected to the Life Safety Branch is the T/C on Electrical Systems of the Health Care Facility Project.
Panel Meeting Action: Reject
Panel Statement: Additional safety to persons working in the generator system vicinity and panels is achieved with this change. Electrical safety for panel performing maintenance, tests or examining equipment is within the scope of NFPA 70.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-45 Log #148 NEC-P15
(Final Action: Accept
(517.34(B)(5))

TCC Action: The Technical Correlating Committee understands that the panel action on this comment results in Proposal 15-70 being rejected.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 15-70
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting. Previous action on Proposal 15-70 has been reconsidered, and is hereby withdrawn. 2005 NFPA 70 language is restored: 517.34(B)(5) Automatically operated doors.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-46 Log #1652 NEC-P15
(Final Action: Reject
(517.34(B)(5))

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-70
Recommendation: Concur with Panel 15 action. Automatically operated doors, other than those in means of egress, can be connected to Equipment System per 4.4.2.2.3.5 in NFPA 99 or 517.34(B)(9) in Article 517.
Panel Meeting Action:Reject
Panel Statement: See panel action and statement on Comment 15-45. Automatic doors used for egress are required to be connected to the life safety branch per 517.32(D). There are many applications for non-egress automatic doors within a hospital, Article 517.34(D)(5) provide for the continued operation of these doors in an off-normal situation while not further burdening the life safety branch.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-47 Log #1653 NEC-P15
(Final Action: Reject
(517.35(C))

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-71
Recommendation: Accept in Principle Proposal 15-71. Change reference to A.4.4.1.1.2(5) so that extract reference should read: “[NFPA 99, A.4.4.1.1.2(5)].”
Substantiation: Correct reference from NFPA 99 is text as listed in Annex A of NFPA 99.
Panel Meeting Action: Reject
Panel Statement: This text is not in the body of NFPA 99. The submitter references material contained in an informative annex and since the annex is not mandatory text, an extract is not appropriate.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-48 Log #1654 NEC-P15
(Final Action: Accept in Principle
(517.40(A) Exception)

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-72
Recommendation: Accept Proposal 15-72 using text included in negative vote of Mr. Erickson.
Substantiation: Agree with negative vote of D. Erickson.
Panel Meeting Action: Accept in Principle
Panel Statement: Change the extract reference [NFPA 99: 17.3.1.4.2, 18.3.4.1.2]” to [NFPA 99: 17.3.4.2.2(3), 18.3.4.2.2(3)]”
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-49 Log #1655 NEC-P15
(Final Action: Accept in Part
(517.40(B))

TCC Action: The Technical Correlating Committee directs that the sentence added by the panel in the panel action text be modified to read as follows: “For those nursing homes and limited care facilities...”.
This revision will correct the grammatical inconsistency in the sentence.
Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-73
Substantiation: 1. I agree with negative vote of Mr. Erickson.
2. Responsibility for specifying which type of essential electrical system is required for a health care facility is the responsibility of the Health Care Facility project. Referenced change was made in NFPA 99-2005 edition to requirements for nursing homes.
Panel Meeting Action: Accept in Part
Change 517.40(B) to read as follows:
(B) Inpatient hospital care facilities. Nursing homes and limited care facilities that admit patients who need to be sustained by electrical life support equipment, the essential electrical system from the source to the portion of the facility where such patients are treated shall comply with requirements of Part III, 517.30 through 517.35.
Panel Statement: The panel accepts the submitter’s text.
The panel rejects the extract reference “[NFPA 99: 17.3.4.2.4, 18.3.4.2.4]” because the entire paragraph is not extracted material.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-50 Log #712 NEC-P15
(Final Action: Reject
(517.42)

Submitter: Burton R. Klein, Burton Klein Associates
Comment on Proposal No: 15-77
Substantiation: NFPA 99, section 4.5.2.2.2, already uses the term “Emergency System” for the items listed in 517.42. The list in 517.42 is the same as that in NFPA 99, section 4.5.2.2.2. This issue is not related to that of subdividing the “emergency system” in nursing homes into 2 branches.
Panel Meeting Action: Reject
Panel Statement: Section 517.40(B) requires that Nursing Homes which incorporate “Inpatient Hospital Care Facilities” must have an Essential Electrical System meeting the requirements of 517.30 through 517.35. Within those requirements, Section 517.31 addresses requirements of the emergency system, including automatic connection to alternate power after interruption of the normal power source. The submitter’s concerns are addressed in existing code language.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-52 Log #1656 NEC-P15
(Final Action: Reject
(517.44(C))

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-83
Substantiation: Although Panel 15 has extracted text that is “recommended” in NFPA 99 [A.4.4.1.1.2(5)], and made it mandatory, it is still based on text in another NFPA document, and thus subjected to “Extract Policy.” Not clear, however, whether this action is acceptable under NFPA Standards Council policy on “Extract Policy”.
Panel Meeting Action: Reject
Panel Statement: This text is not in the body of NFPA 99. The submitter references material contained in an informative annex and since the annex is not mandatory text, an extract is not appropriate.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-53 Log #338 NEC-P15

Final Action: Accept

Submitter: Michael J. Johnston, Plano, TX

Comment on Proposal No: 15-87

Recommendation: The proposal should have been rejected. Restore the original language as follows:

(5) Receptacles and Attachment Plugs. Receptacles and attachment plugs located above hazardous (classified) anesthetizing locations shall be listed for hospital use for services of prescribed voltage, frequency, rating, and number of conductors with provision for the connection of the grounding conductor. This requirement shall apply to attachment plugs and receptacles of the 2-pole, 3-wire grounding type for single-phase, 120-volt, nominal, ac service.

Substantiation: This section is specific to receptacles and attachment plugs used above a hazardous (classified) anesthetizing location. The type of receptacle used in these applications is a specific type that is listed for hospital use. These receptacles and attachment plug configurations are unique in design to allow only restricted compatibility and use, thus reducing hazards in these locations. While it is understood that many health care facilities no longer use flammable anesthetizing agents, the requirements in the NEC (an international electrical Code) still continue to include rules for facilities that use flammable anesthetics and are thus classified as hazardous locations in accordance with 517.60.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-54 Log #1657 NEC-P15

Final Action: Reject

Submitter: Marvin J. Fischer, Monroe Township, NJ

Comment on Proposal No: 15-93


Substantiation: NFPA 99 reference to 700.12(E) in NFPA 70 was intended for the wiring of such lighting units, not for the requirement of installing battery-operated lights in anesthetizing locations. Responsibility for requiring battery-operated lights in anesthetizing locations for the purpose of providing lighting is a Health Care Facility project responsibility. Such lighting units are not emergency exiting devices; rather they are for evaluating patient condition, as well as eliminate need for anesthetologist(s) to hold a flashlight while trying to assess patient condition.

A proposal to NFPA 99 may be in order to clarify this more.

Panel Meeting Action: Reject

Panel Statement: The reference in NFPA 99: 13.4.1.2.6.1(E) to NFPA 70, 700.12(E) is incorrect due to revision in numbering in the 2005 edition. NFPA 99: 13.4.1.2.6.1(E) refers to 517.6(A) which contains the correct reference to 700.12(F).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-55 Log #453 NEC-P15

Final Action: Accept in Principle

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 15-99

Recommendation: Accept as revised: "...by means of a wiring method that meets the general requirements of this code in accordance with 517.12."

Substantiation: The general requirements are vague and can be perceived as including all wiring methods. The proposal has nothing to do with equipment wiring between parts, which may be cords, but conductors that connect to the power supply. The exception permits cords for such connections.

Panel Meeting Action: Accept in Principle

Revise 517.71(A) as read as follows:

517.71(A) Fixed and Stationary Equipment. Fixed and stationary X-ray equipment shall be connected to the power supply by means of a wiring method complying with applicable requirements of Chapters 1 through 4 of this Code, as modified by this Article, that meets the general requirements of this code.

Exception remains unchanged.

Panel Statement: The text change improves usability and satisfies the submitter’s intent.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

15-56 Log #2050 NEC-P15

Final Action: Hold

(517.80 Exception No. 3 (New))

TCC Action: The Technical Correlating Committee directs that this comment be reported as "Hold" because it introduces a concept that has not had adequate public input applied to protection from raceways and the placement in 517.13(B) can be interpreted to extend that to requirements other than the protection via a raceway. The exception is not written to clearly indicate to what portion of the requirements the exception applies.


Submitter: Hugh O. Nash, Jr., Nash Lipsey Burch

Comment on Proposal No: 15-103

Recommendation: Delete 517.80 Patient Care Areas, including the FPN. Add an additional exception under 517.13(B).

Exception No. 3 shall read: Secondary circuits of Class 2 and Class 3 communications or signaling systems.

Substantiation: 517.80 has been a source of confusion for many years. Nurse call and other Class 2 and Class 3 communications systems at the patient bedside are intrinsically safe. This section has been misinterpreted by some AHJs. Some have interpreted this section to mean that nurse call wiring must be installed in metallic conduit for mechanical protection. This has never been the intent of 517.80, since nurse call systems are not a part of the emergency systems. Some AHJs have required insulated green ground conductors in metallic conduit. 517.30(C)(3)(X) permits secondary circuits of Class 2 or Class 3 communication or signaling systems to be installed without mechanical protection. The proposed exception under 517.13(B) will make it clear that metal conduit and an insulated green ground conductor are not required for electrical safety.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

MORGAN, E.: The Panel previously accepted Proposal 15-103, which gave sufficient language to clarify the intent and requirement of Section 517.80. However, this comment would delete all of 517.80 and establish a new Exception No. 3 to 517.13(B). I believe this is incorrect for several reasons:

This Comment would establish a new exception to a section dealing with the dual ground path requirement for receptacles and equipment in a patient care area. It is not an appropriate location for an exception dealing with Class 2 and Class 3 circuits.

Section 517.80 should not be deleted. Class 1 circuits would not be covered in the proposed Comment language. Class 1 circuits may produce up to 1,000 volt-amperes (33.3 amps at 30 volts), Class 2 and Class 3 circuits can produce power up to 100 volt-amperes (5 amps at 20 volts, or 1 amp at 100 volts). Refer to NEC Article 725 and Tables 11 and 12 in Chapter 9. While these low-power sources may not be of great concern in usual wiring applications, they can produce sufficient energy to be hazardous to a person with compromised resistance or health, particularly in a wet environment.

Finally, I believe that Comment 15-56 has introduced new material, and is indeed in conflict with the original Proposal 15-103. This Comment does not accomplish the same purpose as did the original proposal, nor is there adequate substantiation to enact such a change. I hereby request that the TCC review this material and determine whether the Panel action is appropriate or not.

TALKA, D.: Comment 15-56 was intended to be a modification of Proposal 15-103, which served to clarify the intent of 517.80 with respect to what communications, signaling, data fire alarm and other systems operating less than 120 volts nominal are intended to be enclosed in raceways and which addressed the apparent conflict with 517.30(C)(X). The 15-56 comment, as written, goes well beyond the original intent of Proposal 15-103 as it excludes from consideration circuits that should be subject to mechanical protection and grounding requirements. Further, Class 2 and 3 circuits are not necessarily intrinsically safe which is one of the main points of the substantiation. This action should revert back to the last point of panel consensus, as noted in 15-103 of the June 2007 ROP.

WHITE, A.: The removal of the requirements of communications circuits from 517 Part VI Communications, Signaling Systems, Data Systems, and Alarm Systems, and Systems less than 120 Volts, to 517 Part II specifically 517.13, Grouping of Receptacles and Fixed Electric Equipment in Patient Care Areas, presents real utilization issues for code users. One would logically look to 517 Part VI communication, signaling systems and not to 517.13 patient care area receptacle and equipment grounding for guidance concerning communications and signaling systems.

Furthermore, the assertions that Class 2 and Class 3 communication circuits are intrinsically safe is simply incorrect, both Class 2 and 3 systems may be supplied by power supplies that are “not inherently power limited” [see 2005 NEC Table 11A].
Substantiation: There is no need to describe characteristics of the transformer if specified as an isolation type which is defined. Generators other than motor-driven types may be suitable. “Suitably” is subjective and not specific. The definition of “isolated” in Article 100 pertains to accessibility while the intent appears to pertain to electrical separation. Proposal clarifies the supply system branch.

Panel Meeting Action: Accept in Part
Change 517.160(A)(1) to read as follows:
517.160(A)(1) Isolated Power Circuits. Each isolated power circuit shall be controlled by a switch that has a disconnecting pole in each isolated circuit conductor to simultaneously disconnect all power. Such isolation shall be accomplished by means of one or more isolation transformers, having no electrical connection between primary and secondary windings, by means of midget service sets, or by means of suitable electrically isolated batteries.

Panel Statement: The Panel accepts that part of the comment that improves readability of the section.

The panel rejects the submitter’s second sentence as connection to the critical branch is already required by Section 517.33(A)(1).

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

15-59 Log #1588 NEC-P15
(517.160(B))
Final Action: Reject

Submitter: Marvin J. Fischer, Monroe Township, NJ
Comment on Proposal No: 15-107
Substantiation: Requirements in 517.160(B) are performance characteristics for line isolation monitors (e.g., level of hazard current at which alarm will be activated, use of lights to indicate LIM status). Wording is very much, if not identical, to that in NFPA 99.

Panel Meeting Action: Reject
Panel Statement: There are sufficient differences between the defined characteristics contained in NFPA 99 and NFPA 70, and therefore, an extract reference is not appropriate.

The panel requests the Standards Council to review and clarify the ownership of defined characteristics common to NFPA 99 and NFPA 70.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

ARTICLE 518 PLACES OF ASSEMBLY

15-60 Log #805 NEC-P15
(518.4(A))
Final Action: Accept

Submitter: John Kincaid, Systimax Solutions
Comment on Proposal No: 15-110
Recommendation: Continue to reject this proposal.
Substantiation: The submitter’s substantiation does not address the fact the general-purpose cables are used in concealed spaces unless the concealed space is part of the air handling system; only then are plenum cables, which sit atop the cable substitution hierarchy, required.

It appears that the submitter is attempting to change the requirements for cables in an air handling system. Standards Council Decision 05-24 (SC/9057-4) dated July 29, 2005 requires that the NEC Project maintain the status quo on issues related to plenum cables.

Panel Meeting Action: Accept
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

15-61 Log #1679 NEC-P15
(518.4(A))
Final Action: Accept

Submitter: Richard J. Rockosi, ARKEMA Chemicals
Comment on Proposal No: 15-112
Recommendation: Continue to reject this proposal.
Substantiation: The submitter’s statement about “fluoropolymers” (sic) is grossly inaccurate. Fluoropolymers are used to make the highest performing plenum cables available on the market today. The first plenum cables listed by UL in 1978 had fluoropolymer insulation. Their combustion toxicity was reviewed by the NFPA Toxicity Advisory Committee (see their report dated 5/21/84). A toxic hazard evaluation has been published; see Richard W. Bukowski, “Toxic Hazard Evaluation of Plenum Cables,” Fire Technology, Vol. 21, No. 4, November 1985, p. 25.

Panel Meeting Action: Accept
Panel Statement: The panel makes no judgment about the technical accuracy of the commenter’s substantiation, however, completely aside from toxicity issues, the panel reiterates the other reasons for rejection of the original proposal as outlined in the ROP.

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

15-62 Log #1387 NEC-P15
(518.4(C) Exception (New))
Final Action: Reject

Submitter: William Wagner, Certification Solutions
Comment on Proposal No: 15-112
Recommendation: This Proposal should be Accepted as revised below:
Electrical nonmetallic tubing and rigid nonmetallic conduit are not recognizable for use in other space used for environmental air in accordance with 300.22(C).

Exception: Phenolic Type TRTC rigid nonmetallic conduit shall be permitted for use in other space used for environmental air as covered in 300.22(C) if listed as having adequate fire-resistant and low smoke-producing characteristics.

Substantiation: This proposal was presented as a companion proposal to 3-92 (NEC 300.22). It was rejected due to insufficient technical substantiation. However, technical substantiation has now been developed to demonstrate the ability of these products to be safely used in these applications and is being presented to CMP-3 in support of revised proposal 3-92, CMP-8 in support of revised proposals 8-79 and 8-80, and CMP-15 in support of revised proposal 15-112.
The position of Underwriters Laboratories in relation to flame spread and smoke developed values for materials used in plenums was put forth in UL's Mr. Randy Laymon's letter dated December 15, 2004.

As a result of my initial proposal, and this UL position paper, FRE Companies (2005) Inc. undertook testing with Underwriters Laboratories of their phenolic RTRC products to both UL 2024 plenum and riser tests, and the ASTM E84 flame spread and smoke developed tests. As can be seen from the UL test data and reports, phenolic RTRC products, in a variety of trade sizes, were able to complete each of these testing programs with flame and smoke ratings significantly below the criteria established for products to be used in both plenum and riser applications.

The performance of these products, as demonstrated, is summarized as follows:

<table>
<thead>
<tr>
<th>Test</th>
<th>Maximum Permitted Value</th>
<th>Maximum Test Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plenum (UL 2024) Flame</td>
<td>5.0 ft</td>
<td>2.0 ft</td>
</tr>
<tr>
<td>Plenum (UL 2024) Smoke Peak</td>
<td>0.30</td>
<td>0.10</td>
</tr>
<tr>
<td>Plenum (UL 2024) Smoke Avg.</td>
<td>0.15</td>
<td>0.02</td>
</tr>
<tr>
<td>Riser (UL 2024) Flame</td>
<td>12.0 ft</td>
<td>4.0 ft</td>
</tr>
<tr>
<td>Riser (UL 2024) Temperature</td>
<td>850.0°F</td>
<td>71°F</td>
</tr>
<tr>
<td>ASTM E84 Flame Spread Index (FSI)</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>ASTM E84 Smoke Developed Index (SDI)</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

Therefore, in consideration of the data generated by an independent, NRTL accredited test laboratory, and in conjunction with UL's stated position on this issue, these conduit products have conclusively demonstrated their ability to perform acceptably in both plenum and riser applications and I recommend their inclusion in NEC 355.10 in accordance with the revised proposal. It should be noted that this proposal has been slightly modified from its original version in order to delete the FPN indicating suggested acceptance criteria for these products. The development of appropriate flame and smoke criteria, along with the product's listing requirements is best left to the determination of the listing organization. However, regardless of which of the established flame and smoke criteria the listing organization chooses, phenolic RTRC has demonstrated its ability to perform safely. Additionally, a reference to “phenolic” RTRC conduit has been added in order to limit this proposal to only that conduit type which was evaluated as part of the technical substantiation provided with this comment.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Rejected

Panel Statement: Toxicity is not the only issue. Not only are the technical substantiations inadequate and not appropriate, no mechanical properties were provided. Physical protection is of paramount importance in assembly occupancies where temporary changes to the venue occur on a regular basis.

This action correlates with the action taken by CPM-3 on Comment 3-68 on Proposal 3-92.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Final Action: Accept

3-80 Log #149 NEC-P03 (518.4(C) Exception and FPN (New))

Submitter: Technical Correlating Committee on National Electrical Code

Proposal No: 15-112

Recommendation: It was the action of the Technical Correlating Committee that this proposal be sent to Code-Making Panel 3 for consideration in Article 300 during the public comment stage. The issues raised in the proposal are not unique to Article 518 and are more appropriately judged by Code-Making Panel 3 relative to general wiring methods. This action will be considered by Code-Making Panel 3 as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: This continues to be a proposal to be rejected based on Standards Council Decision 05-24 (SC #05-7-4). This decision relates to combustibles in plenums and would include cables in conduit as well as “plenum cables.”

“1. Jurisdiction over combustibles in plenums. As the Council has indicated earlier in this decision, the Technical Committee on Air Conditioning, rather than the NEC Project has, for many years, and should continue to have, primary jurisdiction for air distribution systems including the subject of combustibles, such as cables, in ducts, plenums and other air handling spaces (plenum spaces).”

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

Final Action: Accept

3-81 Log #360 NEC-P03 (518.4(C) Exception, FPN (New))


Proposal No: 15-112

Recommendation: CMP-8 supports the action on this proposal by CMP-15.

Substantiation: CMP-8 supports the action on this proposal by CMP-15.

This comment has been balloted through CMP-8 with the following ballot results:

12 Eligible to Vote
12 Affirmative

Mr. R. Loyd voted affirmatively stating: “Proposal 15-112 was to Reject. I agree with Mr. Burns’ recommendation to revise the panel action.”

Panel Meeting Action: Accept

Final Action: Reject

15-63 Log #318 NEC-P15 (518.5)


Proposal No: 15-116


Substantiation: The general rule of Chapter 3 already requires that any neutral involving a circuit with a major portion of nonlinear loads be considered a current carrying conductor. 310.15(B)(4) specifies that neutrals of nonlinear loads are to be counted. Neutrals of linear loads are not directed to be counted as current carrying conductors.

The necessity of considering the neutral of even a linear load dimming system as a current carrying conductor is a clear differentiation between the two types, and the associated special requirements for sine wave dimmers that presents a linear load makes it necessary to draw a clear differentiation between the two types, and the associated special neutral requirements (or lack thereof) for each type of solid state dimmer.

This comment was balloted through CMP-6 with the following ballot results:

11 Eligible to Vote
10 Affirmative
1 Negative

Mr. Friedman voted negatively stating: “This comment does not indicate that CMP-15’s action was incorrect. It only advised that the method of handling neutrals of nonlinear loads is covered in 310.15(B)(4).
However, CMP-15 decided that the best way to handle the proposal was to advise of the two different dimmer systems and when to count neutrals as current carrying conductors. This was done to be helpful to the users of phase control and sine wave dimmer systems.

Since the comment statement finds no fault with CMP-15’s action, but only a different way it could have been done, I do not agree with the comment.

The CMP-6 comment should be that "CMP-6 supports CMP-15 action to clarify de-rating for neutral conductors of feeders used to supply phase control and solid state sine wave dimmer loads.”

Panel Meeting Action: Reject

Panel Statement: Prior to 2005, there was only one type of solid state dimmer: the phase control type that presented a nonlinear load and required neutrals of feeders to be considered current carrying conductors. Furthermore that non-linearity was not due to traditional and recognizable reasons. This required special emphasis in Article 518 and 520. The emergence of new technology solid state sine wave dimmers that present a linear load makes it necessary to draw a clear differentiation between the two types, and the associated special neutral requirements (or lack thereof) for each type of solid state dimmer. This cannot be left in an ambiguous state by simply leaving out the special neutral requirements for sine wave dimmers—it needs to be explicitly stated that such dimmers do not require the neutral to be considered a current carrying conductor. The wording of the original panel action on the proposal accomplishes this. Finally, the wording “... or may use both phase-control and sine-wave dimmer...” is needed to clearly require that systems using field-interchangeable plug-in phase-control and sine-wave dimmers must be treated as if the worst case use of phase control dimmers applies, even if the modules installed at time of system installation are sine wave modules.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16
The Technical Correlating Committee directs the panel to reconsider the Renumber Article 519 to Article 522.

and Class 3 circuits, it appears the Task Group that worked on this proposed Substantiation Recommendation: Comment on Proposal No: Submitter: (519 (New) ) Ballot Results: Number Eligible to Vote: 11

15-66 Log #684 NEC-P15 Final Action: Accept (519 (New) ) Submitter: James M. Daly, Upper Saddle River, NJ Comment on Proposal No: 15-121 Recommendation: I agree with the Panel action except the word “multi-conductor” should be changed to “multiconductor” in 519.20, in two places in 519.21(B), and in one place in 519.21(C).

Submitter: Neil F. LaBrake, Jr., Syracuse, NY Comment on Proposal No: 15-2 Recommendation: Continue to accept the following portions of the TCC Grounding and Bonding Task Group proposal 15-2 as modified and revised by the actions of CMP-15 for which the TCC Grounding and Bonding Task Group recommends that CMP-15 accept the revisions to 520.81 as proposed in Proposal 15-2. This retains the specific references to Parts VI and VII of Article 250 in the last sentence of this section.
**ARTICLE 525  CARNIVALS, CIRCUSES, FAIRS, AND SIMILAR EVENTS**

15-70 Log #1359 NEC-P15  Final Action: Accept in Principle (525.11)

**Substantiation:** The changes proposed to 520.81 were made as a part of the Task Group’s work to meet the requirements of the NEC Style Manual Section 4.1.1 which does not permit a section to refer to an entire article, but does permit references to the appropriate parts of such articles.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-I. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Mike J. Houston; Jeffrey Bokser; Dalep Mohia; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

**Panel Meeting Action:** Accept in Principle

Delete the last sentence of 520.81.

**Panel Statement:** The action satisfies the panel’s contention that more than Part VI an Part VII of Article 250 apply to Section 520.81. This change complies with the NEC Style Manual, Section 4.1.1.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

**ARTICLE 525  CARNIVALS, CIRCUSES, FAIRS, AND SIMILAR EVENTS**

15-69 Log #152 NEC-P15  Final Action: Accept (525.2)

**Submitter:** Technical Correlating Committee on National Electrical Code

**Comment on Proposal No:** 15-145

**Recommendation:** The Technical Correlating Committee directs that the word “device” be inserted between “overcurrent” and “supplying” in the last sentence of the panel action. This action is consistent with the affirmative comment on vote indicating the needed editorial correction.

**Submitter:** Mark R. Hilbert, Wolfeboro, NH

**Comment on Proposal No:** 15-150

**Recommendation:** Revise text to read as follows:

525.11 Multiple Sources of Supply. Where multiple services or separately derived systems, or both, supply portable structures, the equipment grounding conductors of all the sources of supply that serve such structures separated by less than 3.7 m (12 ft) shall be connected to the same grounding electrode system bonded together at the portable structures. The bonding conductor shall be sized in accordance with Table 250.122 based on the largest overcurrent supplying the portable structures.

**Substantiation:** Revising the meeting action on this proposal as recommended will increase safety by using the shortest means possible to reduce the potential between the portable structures and will add clarity to this section by specifying how the conductor is to be sized as the recommended text in Proposal 15-150 provided no specific guidance on how to size the bonding conductor. Further, by requiring bonding of the grounding electrode systems, the implication is that a grounding electrode system must be installed when, in fact, there is no requirement to do so. Prior to the 2005 NEC, the frame of a vehicle mounted generator was recognized by 250.34 as a grounding electrode and, therefore, the frames of the vehicles could be bonded together to comply with 525.11. However, with the revision of that section in 2005, the vehicle frame is not recognized as a serving electrode nor is it required to be connected to one. Accepting the text as proposed will provide an effective means of reducing the potential differences between portable structures while providing a prescriptive requirement for the installation.

**Panel Meeting Action:** Accept in Principle

Revise text to read as follows:

525.11 Multiple Sources of Supply. Where multiple services or separately derived systems, or both, supply portable structures, the equipment grounding conductors of all the sources of supply that serve such structures separated by less than 3.7 m (12 ft) shall be connected to the same grounding electrode system bonded together at the portable structures. The bonding conductor shall be copper and sized in accordance with Table 250.122 based on the largest overcurrent supplying the portable structures, but not smaller than No. 6 AWG.

**Panel Statement:** The panel is concerned that conductors smaller than No. 6 AWG copper will be subject to physical damage, therefore, a minimum size is defined.

The change satisfies the submitter’s intent.

**Number Affirmative to Vote:** 16

**Ballot Results:** Affirmative: 16

15-70 Log #1359 NEC-P15  Final Action: Accept in Principle (525.2, Operator, Portable Structures)

**Submitter:** Mark R. Hilbert, Wolfeboro, NH

**Comment on Proposal No:** 15-144a

**Recommendation:** The individual responsible for starting, stopping and controlling an amusement ride or responsible for starting, stopping and controlling an amusement ride or supervising a concession.

**Panl Meeting Action:** Accept

**Number Eligible to Vote:** 16

**Ballot Results:** Affirmative: 16

15-72 Log #1363 NEC-P15  Final Action: Accept in Principle (525.11)

**Submitter:** Mark R. Hilbert, Wolfeboro, NH

**Comment on Proposal No:** 15-150

**Recommendation:** Revise text to read as follows:

525.11 Multiple Sources of Supply. Where multiple services or separately derived systems, or both, supply portable structures, the equipment grounding conductors of all the sources of supply that serve such structures separated by less than 3.7 m (12 ft) shall be connected to the same grounding electrode system bonded together at the portable structures. The bonding conductor shall be sized in accordance with Table 250.122 based on the largest overcurrent supplying the portable structures, but not smaller than No. 6 AWG.

**Panel Meeting Action:** Accept in Principle

Revise the proposed new definitions as follows:

Operator. As used in this Article, the operator shall be The individual responsible for starting, stopping and controlling an amusement ride or supervising a concession.

Portable Structures. Units designed to be moved including, but not limited to, amusement rides, attractions, concessions, tents, trailers, trucks, and similar units.

Substantiation: Revising the proposed new definitions in the manner above will incorporate the directive from the TCC in Proposal 15-145 to follow the NEC Style Manual and not include the term being described in the definition. The language “for the purposes of this Article” was removed from both definitions as it is not necessary in these new definitions as they are only used in Article 525. Further, revising the definition of “Portable Structures” here will correlate with the panel action on proposal 15-145 to be more concise and accurately reflect the terms used in the industry with this proposal.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 16

**Ballot Results:** Affirmative: 16
and therefore the frames of the vehicles could be bonded together to comply with the intent of 252.11. However, with the revision of that section in 2005, the vehicle frame is not recognized as serving as a electrode nor is it required to be connected to one. Accepting the text as proposed will provide an effective means of reducing the potential differences between portable structures while providing a prescriptive requirement for the installation.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 15-71.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

15-73 Log #1361 NEC-P15 Final Action: Reject (525.21(A))
Submitter: Mark R. Hilbert, Wolfeboro, NH
Comment on Proposal No: 15-152
Recommendation: Accept this Proposal in Principle and revise as follows: 525.21 Rides, Tents and Concessions.

Paragraph (A): Disconnecting Means. Each ride and concession shall be provided with a disconnecting means in accordance with (1) or (2) or (4).

1. A fused disconnect switch or circuit breaker shall be located within sight and within 1.8 m (6 ft) of the operator's station. This disconnecting means shall be readily accessible to the operator, including when the ride is in operation. Where accessible to unqualified persons, the enclosure for the switch or circuit breaker shall be of the lockable type.

2. Where the ride or concession is provided with fused disconnect switch or circuit breaker, an additional disconnecting means without internal overcurrent protection, shall be provided where accessible to unqualified persons, and shall be located within sight and within 1.8 m (6 ft) of the operator's station. The disconnecting means shall be readily available to the operator, including when the ride is in operation. Where accessible to unqualified persons, the enclosure for the switch or circuit breaker shall be of the lockable type.

Exception: Where the ride or concession is provided with overcurrent protection, the disconnecting means shall not be required to have overcurrent protection.

4. A shunt trip device that opens the fused disconnect or circuit breaker when a switch located in the ride operator’s console is closed shall be a permissible method of opening the circuit.

Substantiation: Revisions to 250.104(B) regarding the bonding requirements for metal parts of appliances, devices, and equipment shall be connected to equipment grounding conductors. This is not to apply to pendant and portable lamps, to stage lighting and stage sound equipment, or to other portable and special stage equipment operating at not over 150 volts dc to ground.

Recommendation: Change 250.20 to read as follows: 530.20 Grounding
Type MC cable, Type MI cable, metal raceways, and all non-current-carrying metal parts of appliances, devices, and equipment shall be connected to equipment grounding conductor. This shall not apply to pendant and portable lamps, to stage lighting and stage sound equipment, or to other portable and special stage equipment operating at not over 150 volts dc to ground.

Article 530

15-75 Log #1260 NEC-P15 Final Action: Reject (530.64(B))
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 15-2
Recommendation: Continue to accept the following portions of the TCC Grounding and Bonding Task Group proposal 15-2 as modified and revised by the actions of CMP-15 for which the TCC Grounding and Bonding Task Group recommends that CMP-15 accept the revisions to 530.64(B) as proposed in Proposal 15-2. This retains the specific references to Parts VI and VII of Article 250 in the last sentence of this section.

Substantiation: The changes proposed to 530.64(B) were made as a part of the Task Group’s work to meet the requirements of the NEC Style Manual Section 4.1.1 which does not permit a section to refer to an entire article, but does permit references to the appropriate parts of such articles.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Code included C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohia; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Reject
Panel Statement: The meaning is not materially changed by the proposed language and it uses an exception, which is to be avoided per the Manual of Style.

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

ARTICLE 547 AGRICULTURAL BUILDINGS

19-3 Log #1449 NEC-P19 Final Action: Reject (547.2)
Submitter: Donald W. Zipse, Electrical Forensics, LLC
Comment on Proposal No: 9-5
Recommendation: Delete section 547.2 Equipment Plane.

Substantiation: The “Panel Statement” for this proposal contains a “method” that is misleading. The proposed text is not consistent with the definition of Equipment Plane(s) in Article 547.

This panel believes that the definition of Equipment Plane as written in Article 547 is clear, concise, and effective. This proposal is not consistent with the definition of Equipment Plane(s) in Article 547.

The rules are to limit each proposal to a “SINGLE SECTION”, which was done. Therefore your statement is invalid since I have followed instructions and have submitted detailed proposals for all the other sections dealing with the so-called Equipment Plane, which would have removed the offending words from Article 547.
Based on the submitter’s remarks, it is clear that he recognizes the
requirements in Article 334.

Substantiation:

Recommendation:

Comment on Proposal No:

Panel Meeting Action: Accept
Panel Statement: See the panel action and statement on Comment 19-4.
Number Eligible to Vote:
Ballot Results: Affirmative: 8

Submitter: Linda J. Little, St. Louis, MO
Comment on Proposal No: 19-11
Recommendation: Proposal 19-11 should be Rejected.

Substantiation: The submitter correctly states that 340.10(4) places restrictions on the use of Type UF cable. No technical substantiation is presented to warrant deviation from these restrictions in agricultural areas. If surface wiring is “preferred,” then appropriate surface wiring methods should be selected. The panel contradicts itself in the panel statements of Proposals 19-10 and 19-11. In 19-10, the submitter is informed that data verifying the effects of the hazards caused by rodent damage should be submitted before a change is warranted. Then in Proposal 19-11, the panel statement not only acknowledges the damage caused by rodents, but claims that this damage is increased by concealment of nonmetallic types of cables. It is inappropriate to tell one submitter that documentation is required to make a change, and then turn right around and make another change (in opposition to the recommended uses of a particular wiring method) without the same documentation.

The general rules in Chapters 1-4 should only be modified when essential for a reliable and safe installation. Certainly, there must be adequate justification to warrant any such deviation. Alteration of the general rules should enhance the installation and make it safer - this is not a convenience issue. If damage due to rodents is serious enough to warrant a change, more durable wiring methods (as suggested by the submitter of Proposal 19-10) will not only enhance the installation, they will promote safety by using wiring methods in the manner intended and already approved by earlier articles in the NEC.

Panel Meeting Action: Accept
Number Eligible to Vote:
Ballot Results: Affirmative: 8

Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 9-11
Recommendation: The panel action on the Proposal should be Reject.

Substantiation: I agree with the Explanation of Negative vote by J. Bernson.
No technical substantiation has been provided to support deletion of the installation requirements of Part II of Article 334 when Type UF or Type SE cables are installed as interior wiring in other structures permitted to be Types III, IV, or V construction.

The same requirements apply to these substitute interior wiring methods as for Type NMC cable. When installed as interior wiring in other structures permitted to be Types III, IV, or V construction, all of these cable types must comply with 334.10(3) which requires that “Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.”

Types UF and SE cables, when used for interior wiring, and Type NMC cable must comply with Part II of Article 334.

These requirements are consistent with the decision of the NFPA Standards Council, in accepting Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.
EWING, M.: I agree with Mr. Daly’s comment to Proposal 7-21. Remember that 547.5 wiring methods apply to 547.1(A) & (B) areas only and the areas outside of 547.1(A) & (B) are wired according to 547.2. Mr. Daly’s Comment 7-21 will apply to all animal housing/storage facilities and not just those areas originally accepted by Proposal 19-11. If Comment 7-21 is accepted by CMP-7, it makes Comments 19-4, 19-6, and 19-7 worthy of acceptance to reject Proposal 19-11. Note: There is no requirement for tray cable (TC) to be concealed in Article 336 and TC is permitted to be installed in 547.1(A) & (B) areas per 547.5 “other cables or conduits suitable for the location.”

Technical substantiation may be provided from the panel members themselves during the review process and does not necessarily have to be part of the submitter’s written substantiation. There was no technical substantiation for requiring the 334.10(3) finish rating requirement to apply to agricultural buildings when it was created but, as presently written it applies.

19-8 Log #224 NEC-P19 Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 19-13

Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal relative to 353.44 which does not exist. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

The panel accepts the direction of the Technical Correlating Committee to reconsider Proposal 19-13.

Panel Statement: See the panel action on Comments 19-9 and 19-10.

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

19-9 Log #362 NEC-P19 Final Action: Accept

Submitter: Code-Making Panel 8, Comment on Proposal No: 19-13

Recommendation: CMP-8 recommends that CMP-19 Accept this proposal in Part with the revised text.

FNP: See 300.7, and 352.44, and 355.44 for installation of raceway systems exposed to widely different temperatures.

Substantiation: CMP-8 recommends CMP-19 Accept in Part Proposal 19-13 with the proposed wording. Reference 353.44 was deleted in accordance with the CMP-8 action on Proposal 8-73. Type HDPE conduit cannot be used in exposed applications, therefore expansion fittings are not required.

This comment has been balloted through CMP-8 with the following ballot results:

12 Eligible to Vote
12 Affirmative

Mr. R. Loyd voted affirmatively stating: “Proposal 19-13 was to Accept. I agree with Mr. Burns’ recommendation to revise the panel action.”

Panel Meeting Action: Accept

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

19-10 Log #1390 NEC-P19 Final Action: Accept

Submitter: William Wagner, Certification Solutions

Comment on Proposal No: 19-13

Recommendation: This proposal should be Accepted as revised below:

FNP: See 300.7, and 352.44, and 355.44 for installation of raceway systems exposed to widely different temperatures.

Substantiation: In accordance with the TCC Action on Proposal 19-13, the FNP to 547.5(A) should be revised to include the correct references to the rigid nonmetallic conduit requirements. This correlates with the panel action on Proposals 8-53 and 8-78.

Panel Meeting Action: Accept

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

19-11 Log #293 NEC-P19 Final Action: Accept in Part

Submitter: Code-Making Panel 3, Comment on Proposal No: 19-14

Recommendation: CMP-3 recommends rewording the recommended text to read as follows:

“Nonmetallic boxes, fittings, conduit, and cables shall be permitted to be mounted directly to any building surface covered by this article without maintaining the 6 mm (1/4 in.) airspace in accordance with 300.6(D) and 312.2(A).”

Substantiation: This exclusion has been in the code since the 1990 NEC and was permitted for any building surfaces for two reasons. The first reason was to install the wiring method to closely follow the contour of the building structure to keep animals from easily damaging the wiring methods. The second reason was there was no data available indicating that water and other liquids were causing damage to these wiring methods on wood structures.

This comment was balloted through CMP-3 with the following results:

13 Eligible to Vote
11 Affirmative
1 Negative
1 Not Returned (J. Sleights)

Mr. M. Sanders voted negatively stating: “The issue that was raised by the Technical Correlating Committee is that the basic rule of 300.6(D), in conjunction with 312.2(A), already states the exception that addresses the submitter’s concern, and is unclear as to what is the technical reason why it should be repeated a third time in Article 547. The exceptions in Article 300 and 547 have been copied from 372 (the formerly existing Article) since the 1990 edition of the NEC specifically to address the issue where livestock or other humid wash down environments may occur. This does not add clarity, it adds a third location where future correlation may be needed, and provides needless cross-referencing, which the revisions to 90.3 the past few code cycles have sought to eliminate. It is incumbent upon code users to know the provisions of the first four chapters and that they apply to the Chapters 5, 6, and 7 articles unless they are specifically modified due to substantiated problems or technical concerns.

If there is a problem to be solved with this redundant text, the following is offered for consideration:

“Nonmetallic boxes, fittings, conduit, and cables shall be permitted to be installed in accordance with 300.6(D) Exception and 312.2(A) Exception.”

This should reduce future correlation problems, it will mandate the desired usage, and provide clarity.

Panel Meeting Action: Accept in Part

The panel rejects the addition of the reference to 312.2(A) and accepts the remainder of the comment.


Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

Comment on Affirmative:

EWING, M.: In rewriting ROP 19-14, the CMP failed to incorporate the wording present in Article 312. Article 312 only covers cabinets, cutout boxes, and meter socket enclosures and, therefore, there is no conceptual conflict between the existing text and 312.2(A). Although occasionally made from nonmetallic materials, there is no substantiation on record to waive the spacing requirement when this equipment is mounted on an absorbent surface in an indoor wet location. Note that the existing text of 300.6(D) Exception does waive the spacing requirement on nonabsorbent surfaces.

The spacing waiver in Article 547 originated as a CMP-19 proposal to cover nonmetallic cables in the 1990 code cycle (Proposal 19-8). That proposal preceded the current 300.6(D) Exception (which entered the NEC in the 1993 edition) and referred to problems with animals having an easier time of chewing on cables that were spaced out from the surface, as well problems with cables being hooked by farm implements during the normal course of
The panel modified the language in 547.5(F), and the panel intends to provide technical substantiation supporting the necessity of broadening this allowance.

This comment has been balloted through CMP-9 with the following balloting results:

- **Number Eligible to Vote**: 8
- **Ballot Results**: Affirmative: 8

**Recommendation:**

Revise 547.5(F) as follows:

- *(F)* Separate Equipment Grounding Conductor. Non–current-carrying metal parts of equipment, raceways, and other enclosures, where required to be grounded, shall be connected to ground by a copper equipment grounding conductor installed between the equipment and the building disconnecting means. If installed underground, the equipment grounding conductor shall be insulated or covered.

**Panel Meeting Action:** Reject

**Panel Statement:** This comment is based on language that was modified in the proposal stage. See the panel action and statement on Comment 19-13.

**Number Eligible to Vote**: 8

**Ballot Results**: Affirmative: 8

19-14 Log #452 NEC-P19  
**Final Action:** Reject (547.5(F))

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 19-19

**Recommendation:** Accept proposal revised:
Non-current-carrying metal parts of equipment, raceways, and other enclosures, where required to be grounded... (remainder unchanged).

**Substantiation:** Where grounding is not required by code, but done by choice the requirements should apply. This section may be perceived as modifying 250.11 which indicates Article 250 applies where grounding is “permitted”.

The text does not support the panel statement that voluntary grounding requires the insulated or covered conductor since this section relates to required grounding.

**Panel Meeting Action:** Reject

**Panel Statement:** The submitter’s substantiation is based on text that no longer exists. See the panel action and statement on Comment 19-13.

**Number Eligible to Vote**: 8

**Ballot Results**: Affirmative: 8

19-15 Log #1272 NEC-P19  
**Final Action:** Reject (547.5(F))

**Submitter:** Neil F. LaBrake, Jr., Syracuse, NY

**Comment on Proposal No:** 19-18

**Recommendation:** Revise 547.5(F) as follows:

- *(F)* Separate Equipment Grounding Conductor. Non–current-carrying metal parts of equipment, raceways, and other enclosures, where required to be grounded, shall be connected to ground by a copper equipment grounding conductor installed between the equipment and the building disconnecting means. If installed underground, the equipment grounding conductor shall be insulated or covered.

**Substantiation:** The use of the term “equipment grounding conductor” is correct according to the Panel action on Proposal 5-76 and for the definition of this term in Proposal 5-6.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

**Panel Meeting Action:** Reject

**Panel Statement:** This comment is based on language that was modified in the proposal stage. See the panel action and statement on Comment 19-13.

**Number Eligible to Vote**: 8

**Ballot Results**: Affirmative: 8

19-16 Log #226 NEC-P19  
**Final Action:** Accept (547.9)

**TCC Action:** To be consistent with the panel action on Proposal 19-3, the Technical Correlating Committee directs that text (2) of the panel action text be revised from “…is bonded to...” to “…is connected to...”.

This revision will make the use of the terms consistent with the previous panel actions.

**Submitter:** Technical Correlating Committee on National Electrical Code Technical Comment on Proposal No: 19-26

**Recommendation:** It was the action of the Technical Correlating Committee that the panel reconsider the proposal and avoid repeating the requirements of Article 250 in 547.9. The Technical Correlating Committee notes that all of the requirements outlined in 547.9(B)(3) are covered in Article 250 with the exception of the increased requirement that the equipment grounding conductor be the same size as the ungrounded conductors.

For correlation purposes, it would be more appropriate for the panel to reference the requirements in Article 250 and include the increased requirement for the EGC sizing.

This action will be considered by the panel as a public comment.

**Substantiation:** This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committees Projects.

**Panel Meeting Action:** Accept

**Panel Statement:** The panel accepts the comment and has revised the text per the Technical Correlating Committee direction.

Revise the text of 547.9(B)(3) to read as follows:

- *(3)* Grounding and Bonding. For each building or structure, grounding and bonding of the supply conductors shall be in accordance with the requirements of 250.32.2 separate equipment grounding conductors shall be run with the supply conductors to the building(s) or structure(s), and the following conditions shall be met:
The equipment grounding conductor shall be the same size as the largest supply conductor if of the same material, or adjusted in size in accordance with the equivalent size columns of Table 250.122 if of different materials.

(2) The equipment grounding conductor is bonded to the grounded circuit conductor and the site-isolating device at the distribution point.

(3) The equipment grounding conductor shall be the same size as the largest supply conductor if of the same material, or adjusted in size in accordance with the equivalent size columns of Table 250.122 if of different materials.

(4) The grounded circuit conductor is not connected to a grounding electrode or to any equipment grounding conductor on the load side of the distribution point.

Exception: For existing premises wiring systems only, the grounded conductor run with the supply to the building or structure shall be permitted where all the requirements of 547.10 are met. Panel Statement: By referencing 250.32, a separate equipment grounding conductor is required to be run to each building or structure as the submitter requested in the original proposal (Proposal 19-26). By reference, this will also allow use of the exception for existing premises wiring systems. Redundant language in 547.9(B)(3), list items (3) and (4), is eliminated, as these requirements are covered in 250.32(A) and 250.32(B)(1). The increased requirement for the equipment grounding conductor remains in 547.9(B)(3)(1), and requirements for bonding to the site-isolating device remain in 547.9(B)(3)(2). Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

19-17 Log #1683 NEC-P19 (547.10)

Final Action: Reject

Submitter: Donald W. Zipse, Electrical Forensics, LLC

Comment on Proposal No: 19-30

Recommendation: Delete the whole Section 547.10.

Substantiation: The panel statement states: “The use of equipotential planes is an accepted practice in various industries for reducing step-touch potential.” The writer can understand the confusion that appears to exist with the panel between Equipotential Planes and Step – Touch Potentials. The four (4) original Ag Professors also did not understand the difference between the two. First one has to learn the difference between FAULT CURRENT and STEADY STATE OR CONTINUOUS CURRENT FLOW.

FAULT CURRENT – (From the IEEE) (general) A current that flows from one conductor to ground or to another conductor owing to an abnormal connection (including an arc) between the two. A fault current flowing to ground may be called a ground fault current.

From The peer reviewed technical paper “Equipotential Planes, A Figure of the Imagination” - (Which was sent with 547.2, 19-5) “It is opined that Gustafson, et al and the NEC Making Panels did not take into consideration the purpose of the IEEE Standard 80, “Guide for Safety in AC Substation Grounding”.

IEEE Standard 80 states: “1.2 Purpose. The intent of this guide is to provide guidance and information pertinent to safe grounding practices in ac substation design.

The specific proposes of this guide are to:

a) Establish, as a basis for design, the safe limits of potential differences that can exist in a substation under fault conditions (Author’s emphases) between points that can be contacted by the human body.

b) Review substation grounding practices with special reference to safety, and develop criteria for a safe design.

c) Provide a procedure for the design of practical grounding systems, based on these criteria.

d) Develop analytical methods as an aid in the understanding and solution of typical gradient problems.”

It is a fact and is very clear that Clause 1.2 a) states that IEEE Standard 80 is under fault conditions. Stray current or if one insists, stray voltage, exists under normal continuous flow of neutral distribution current, under continuous utility operating conditions, not fault conditions.”

Now one needs to know the difference between fault current and steady state.

STEADY STATE OR CONTINUOUS CURRENT FLOW - (IEEE) steady current

A current that does not change with time.

We have two types of current flow. Fault current that lasts for cycles until the protective device opens such as a circuit breaker, fuse, recloser or other protective device. Therefore a fault current is usually HIGH LEVELS OF CURRENT FOR A VERY SHORT PERIOD OF TIME.

However, a steady state flow of current such as would be flowing to a lamp, or motor, or a distribution system, such as the current flowing into transformers, is continuous and compared to fault current, steady state is a low level of continuous flow of current.

Table from presentation to Industrial and Commercial Power System Technical Conference, May, 2006, has been provided.
19-19 Log #191 NEC-P19
(547.10(b), FPN No. 1 and 2)

Final Action: Accept
Submitter: Barry Baumann, Alliant Energy
Comment on Proposal No: 19-35
Recommendation: Revise text to read as follows:
547.10 Equipotential Planes and Bonding of Equipotential Planes.
FPN No. 1: Methods to establish equipotential planes are described in American Society of Agricultural and Biological Engineers (ASABE) EP473.2-2001, Equipotential Planes in Animal Containment Areas.
FPN No. 2: Methods for safe installation of livestock waterers are described in American Society of Agricultural and Biological Engineers (ASABE) EP342.2-1995, Safety for Electrically Heated Livestock Waterers.
Substantiation: Along with the American Society of Agricultural Engineers name change to American Society of Agricultural and Biological Engineers, the acronym has been changed from ASAE to ASABE.
Panel Meeting Action: Accept
Number Eligible to Vote: 8
Ballot Results: Affirmative: 8

ARTICLE 550 MOBILE HOMES, MANUFACTURED HOMES, AND MOBILE HOME PARKS

19-20 Log #1511 NEC-P19 (550.4(C))
Final Action: Accept
Submitter: Jeffrey Boksiner, Telcordia Technologies, Inc.
Comment on Proposal No: 19-39
Recommendation: Use the term “neutral conductor” as originally proposed.
Substantiation: This comment was developed by the Technical Correlating Committee (TCC) Task Group (TG) on the definition of “Neutral Conductor.”
Task Group members were: Jeffrey Boksiner (Chair) (CMP 5, TCC), Paul Dobrowsky (CMP 5), Walter Skuggevig (CMP 5), Doug White (CMP 5), Michael Toman (CMP 2, TCC), Bob Wilkinson (CMP2), Jim Daly (CMP 6, CMP 7, TCC), Bill Laidler (CMP 6), and Oran Post (CMP 6). The TCC directed that the action on this proposal be sent to the TG for review and comment.
TG concludes that the term “neutral conductor” is more appropriate because a set of conductors supplies the mobile home. This set of conductors includes the neutral conductor. A system with a neutral point may not necessarily carry the neutral conductor along with the other conductors.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-21 Log #503 NEC-P19 (550.12(D)(3))
Final Action: Reject
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-43
Recommendation: Accept proposal.
Substantiation: The literal indicates a single “outlet” which may contain a single receptacle shall not supply a load in excess of 80 percent of the branch circuit rating. A branch circuit supplying a single receptacle for a single appliance is an individual circuit which per 210.23 may supply a load for which it is rated. What special circumstance or hazard justifies a modification of 210.23?
Panel Meeting Action: Reject
Panel Statement: Section 210.23(A)(1) specifies that any one cord-and-plug utilization equipment not fastened in place shall not exceed 80 percent of the branch-circuit amperage rating. Section 422.10(A) requires the branch-circuit rating for an appliance to be not less than 125 percent of the marked rating of the appliance. Therefore, a “special circumstance or hazard” is not needed to justify the requirements in 550.12(D)(3).
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-22 Log #427 NEC-P19 (550.14(E)(x)(3) (New))
Final Action: Reject
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-61
Recommendation: Accept proposal.
Substantiation: It is not clear whether requirements in Article 210 apply. If Chapters 1 through 4 apply generally, why are 550.12, 550.13, 550.16, 550.18, 550.25, 550.32(B)(2)(4)(8), for example included in this article since they are already covered elsewhere in the code? The bulk of the code could be reduced by eliminating all sections of this article that are also covered elsewhere in the code, which indicates no need for repetition.
Panel Meeting Action: Reject
Panel Statement: The substantiation states the submitter’s request to reduce bulk by eliminating repetition of the requirements, yet the proposal is to repeat a requirement already stated in the general chapters. The requirements in Chapters 1 through 4 apply generally except as amended by Chapters 5 through 7. Since the lighting outlet requirements are not amended in Article 550, those requirements in Article 210 already apply. There is no need for the additional language (see NEC Style Manual 4.1).
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-23 Log #1273 NEC-P19 Final Action: Reject (550.15(B))
Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 19-48
Recommendation: Accept the original proposal from the NEC TCC Task Group on Grounding and Bonding.
Substantiation: The NEC TCC Task Group on Grounding and Bonding agreed that simplification of the definitions was in order and that prescriptive elements would be proposed for specific Article texts as made in Proposal 19-48. The Task Group requests Panel 19 clarify and reconsider the Panel Action on this Proposal to be consistent with the TCC Grounding and Bonding Task Group’s original initiatives.
This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position as stated in the panel statement on Proposal 19-48. This is identical to the language used in 406.5(B), and there is no need to be more prescriptive as to the method of grounding.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-24 Log #426 NEC-P19 Final Action: Accept in Principle in Part (550.15(E))
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-45
Recommendation: Accept as revised:
# Where a range or clothes dryer, or similar appliance is connected by metal covered cable or flexible metal conduit, a length of not less than...remains unchanged.
Substantiation: “Similar appliance” is subjective and not defined; what constitutes a similar appliance? This section addresses metal covered cable and flexible metal conduit, if used, but doesn’t require such methods or limit or prohibit other methods covered in 550.15 such as LFMC ad LFNC. Though FMC provides some protection so do LFMC and LFNC. However, 348.12(7) prohibits FMC were subject to damage the same as 350.12(1) for LFMC and 356.12(1) for LFNC.
Panel Meeting Action: Accept in Principle in Part
In the recommendation, the panel revises “similar appliance” to “other appliance”.
The panel does not accept the deletion of the word “metal”.
Panel Statement: The panel rejects striking the word “metal” as proposed. Striking this word and leaving the remainder of the section unchanged as indicated in the comment would leave conflicting requirements within this section.
The change from “similar appliance” to “other appliance” meets the intent of the submitter and provides clarification.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.
The panel accepts the Technical Correlating Committee direction to circuit conductor is grounded at the disconnecting means in accordance permitted to omit the equipment grounding conductor where the grounded equipment and a disconnecting means as covered in 550.32(A), it shall be the panel action on this comment, a new exception be added to 550.33(A) Exception.

Proposals:

A2007 NEC-P19 (550.18(A)(2))

Submitter: Dan Leaf, Seneca, SC

Recommendation: Accept the proposal.

Substantiation: See Substantiation for proposal. The Code provides for a specific minimum va/sq ft for general lighting and this does not increase if more than the minimum number of circuits is installed. This is reasonable since additional circuits simply exceed Code minimums and provide reliability, diversity, and efficiency due to less voltage drop. This is recognized in 210.52(B)(2), Exception. If a square foot area requires a minimum of three general lighting circuits and six circuits are installed, the calculated feeder or service load is not required to be increased.

Panel Meeting Action: Reject

Panel Statement: Substantiation for this comment with regard to lighting circuits is irrelevant since this section deals with small-appliance branch circuits. The submitter circuit is 210.52(B)(2) Exception, which is irrelevant since 210.52 defines where outlets are required, not load calculations. Section 210.52(B)(2) has two exceptions, neither of which pertains to load calculations in 550.18(A)(2).

It is true that additional lighting circuits can be added without increasing the required load calculation in 550.18(A)(1). This mirrors the requirements in 220.12 for dwelling unit lighting loads. Section 550.18(A)(2) only requires 1500 volt-amperes for each small appliance branch circuit, paralleling the requirements in 220.52(A). Small-appliance branch circuits are intended for appliances. The load on these circuits is expected to be more than on a general-purpose branch circuit, hence the additional load requirement. The submitter has not provided sufficient technical substantiation for changing the requirements for small-appliance branch circuits.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

A2007 NEC-P19 (550.32(B)(2)(4)(6))

Submitter: Dan Leaf, Seneca, SC

Recommendation: Accept the proposal for (B)(2) to delete "equipment".

Substantiation: Service equipment per Article 100 covers switches and circuit 100. "Service" as defined in Article 100 covers conductors, service equipment and related equipment, not limited to service equipment. Service equipment (switches and circuit breakers) are not covered by part I through Part IV.

Panel Meeting Action: Accept

Panel Statement: Under the direction of the Technical Correlating Committee, the panel has revised the text to correlate with the Panel 5 action on Proposal 5-119 relative to an exception for existing installations. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: Such recreational vehicles shall be permitted to be equipped with distribution panels rated 120 volts minimum or 120/240 volts maximum listed for 30 amp or 50 amp applications supplied by the appropriate power supply assemblies.

Substantiation: This would clarify that a 120 volt only panelboard would still be permitted with a 30 amp power supply assembly. Also, reference to a 50 amp application should be deleted since 551.42(C) only applies to 30 amp application. 30 amp requirements are covered under 551.42(D).

Panel Meeting Action: Accept

Panel Statement: Definitions in Article 555 for Marinrds and Boatyards do not apply to Article 551 for Recreational Vehicles and Recreational Vehicle Parks.

Substantiation: See substantiation for proposal. The panel reference to 551.40(B) only provides a general requirement which may not be known to code users. 551.44(D) does not use the term “or larger”; 551.46(C) has specific ratings which do not include the phrase "or larger".

Panel Meeting Action: Reject

Panel Statement: The Technical Correlating Committee directs that in lieu of the panel action on this comment, a new exception be added to 550.33(A) from the Report on Proposals text. The exception will read: “Exception: For an existing feeder that is installed between the service equipment and a disconnecting means as covered in 550.32(A), it shall be permitted to omit the equipment grounding conductor where the grounded circuit conductor is grounded at the disconnecting means in accordance with 250.32(B) Exception.”

The panel created a potential new requirement with their revision in this comment. For mobile homes, feeder conductors can be between the mobile home service equipment and the mobile home or between remote service equipment and a disconnect located within 30 feet. The original exception applied to the feeder between remote service equipment and the disconnect located at the mobile home.

As worded by the panel, this requirement feed the feeder between the mobile home disconnection. The mobile home of complying with 250.32. This reference will be made clear that the equipment grounding conductor can be omitted for an existing feeder.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 19-69

Recommendation: It was the action of the Technical Correlating Committee that the proposal be reconsidered and that the panel consider correlating this proposal with the Code-Making Panel 5 action on Proposal 5-119 relative to an exception for existing installations. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
This comment has been balloted through CMP-9 with the following ballot results:

**Affirmative:** 13
**Eligible to Vote:** 14

Panel Meeting Action: Accept in Principle

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**Submitter:** Code-Making Panel 9.

**Comment on Proposal No:** 19-84

**Recommendation:** Continue to reject the proposal.

**Substantiation:** Although it is certainly true that there will normally be readily accessible upstream methods available to disconnect power to the main conductors supplying a recreational vehicle, that does not mean that the work will be performed deenergized in accordance with safe work practices. Many electricians utilize this (backfed) main to de-energize the panel and then perform maintenance realizing the line side of the main is still energized. Since this device is still energized, it is imperative that provisions to prevent the main from being unplugged are in place. This requirement is intended to provide an additional measure of safety when the work is done hot, even if it shouldn’t be done that way. “Field-installed” in this context applies to all wiring done outside of the panelboard manufacturing facilities, including the wiring done in a recreational vehicle assembly facility.

This comment has been balloted through CMP-9 with the following ballot results:

**Eligible to Vote:** 14
**Affirmative:** 13
**Not Returned:** (H. deVega)

Panel Meeting Action: Accept

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**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 13
**Ballot Not Returned:** 1 Miller, T.

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**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 19-85

**Recommendation:** Accept proposal revised:

Nonmetallic boxes, conduit bodies, and other enclosures, except distribution panels, shall be acceptable only with nonmetallic sheathed cable or nonmetallic raceways.

**Substantiation:** For consistency, the requirement should apply to other enclosures such as conduit bodies and cabinets.

Panel Meeting Action: Rejected

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**Panel Statement:** Section 551.47(C) does not pertain to the broader scope of all enclosures and corresponds with the general requirement in 314.3. The submitter has not provided sufficient technical substantiation to cause lack of correlation with the general requirements in Chapters 1 through 4 of the NEC, particularly Article 314.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 13
**Ballot Not Returned:** 1 Miller, T.

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**Submitter:** Neil F. LaBrake, Jr., Syracuse, NY

**Comment on Proposal No:** 19-86

**Recommendation:** Accept the original proposal from the NEC TCC Task Group on Grounding and Bonding.

**Substantiation:** The NEC TCC Task Group on Grounding and Bonding agreed that simplification of the definitions was in order and that prescriptive elements would be proposed for specific Article texts as made in Proposal 19-86. The Task Group requests Panel 19 clarify and reconsider the Panel Action on this Proposal to be consistent with the TCC Grounding and Bonding Task Group’s initial initiatives.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Rejected

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**Panel Statement:** The panel reaffirms its position as stated in the panel statement on Proposal 19-86.

This is identical to the language used in 406.5(B), and there is no need to be more prescriptive as to the method of grounding.

**Number Eligible to Vote:** 14
**Ballot Results:** Affirmative: 13
**Ballot Not Returned:** 1 Miller, T.
19-35 Log #646 NEC-P19  
(F551.74(S))  
Final Action: Accept

Submitter: Linda J. Little, St. Louis, MO
Comment on Proposal No: 19-89
Recommendation: This proposal should have been Accepted in Principle. 
Revise the last sentence in 551.47(S)(3): 
"An ampere rating compatible with the device not to exceed 80% of the 
circuit rating shall be legibly marked in the blank space."

Substantiation: This new requirement will add safety as the submitter suggests. However, the intended purpose of the circuits is to feed future appliances. These "other appliances or devices" may operate on a continuous basis and the circuit should be sized accordingly as done in 551.47(Q)(3).

Panel Meeting Action: Accept
Panel Statement: The panel notes that in the recommendation of Proposal 19-89, in (2) the last word should be changed from "tapped" to "tapered."
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-36 Log #528 NEC-P19  
(F551.73)  
Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-94
Recommendation: Accept the proposal.
Substantiation: Service entrance conductors are service conductors but all service 
conductors are not service-entrance conductors. There must be service 
conductors from the utility to the service disconnecting means. The FPN for 
Service-Entrance Conductors, Underground System indicates there may be 
no service-entrance conductors. Service lateral conductors terminated at outside 
service equipment are service conductors but not service-entrance conductors, 
and are not covered by Table 551.73.

Panel Meeting Action: Reject
Panel Statement: Conductors falling under the jurisdiction of the utility 
are not subject to the demand factors in Table 551.73. Those service conductors 
that are not considered service entrance conductors typically fall under the 
jurisdiction of the utility.
No substantiation has been provided to warrant expanding the use of demand 
factors in Table 551.73 to conductors other than service entrance conductors.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-37 Log #625 NEC-P19  
(F551.73)  
Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-95
Recommendation: Accept the proposal for (A).
Substantiation: Where the site has a 50-ampere 250-volt receptacle supplied 
by one feeder and a 20-ampere 125 volt receptacle supplied by a different 
feeder, present wording requires only the highest rated receptacle to be used 
for load calculation. The feeder for the 20-ampere receptacle has no required 
load calculation. Omission of the lowest rated receptacle is only reasonable if 
supplied by the same feeder. Limiting the calculated load to only the highest 
rated receptacle should be permitted, not required; a higher calculation should 
not be a violation. Table 551.73 demand factors appear to be developed 
specifically for vehicle sites, not for club houses, recreational buildings, 
swimming pools, tennis courts, etc. which would be covered by the proposed 
exception. There is no prohibition of 220.61 for such other loads.

Panel Meeting Action: Reject
Panel Statement: The additional language "supplied by the same feeder" is 
unnecessary since each feeder is calculated on the basis of what it supplies 
per site as required by the first sentence of 551.73(A). The "permitted to 
be" language is also unnecessary, as 551.73(C) FPN and 551.73(D) FPN 
clearly indicate that the minimum values as calculated by 551.73(A) may 
be inadequate, so conductor size may need to be increased.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-38 Log #527 NEC-P19  
(F551.75)  
Final Action: Reject

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-98
Recommendation: Accept the proposal as revised: 
All exposed noncurrent-carrying metal parts of electrical equipment and 
installation shall be grounded as required by 250.110.
Substantiation: Proposal correlates with 250.110 which specifies "exposed" 
and "noncurrent-carrying" metal and provides exceptions. It may be perceived 
that this section modifies 250.110. 551.76 has wording similar to the proposal.

Panel Meeting Action: Reject
Panel Statement: The additional language is unnecessary and does not add 
certainty. The panel disagrees with the statement, "it may be perceived that 
this section modifies 250.110," since 551.76 clearly states that the grounding 
requirements in Article 250 apply.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-39 Log #229 NEC-P19  
(F551.76(D))  
Final Action: Accept

"TCC Action: The Technical Correlating Committee directs that the 
panel action be revised from "250.32(B)(1) Exception" to "250.32(B) 
Exception". This action will correlate with the action of Code-Making 
Panel 5 on Comment 5-58.
Submitter: Technical Correlating Committee on National Electrical Code 
Proposal on Proposal No: 19-102
Recommendation: It was the action of the Technical Correlating Committee 
that the proposal be reconsidered and the panel consider correlating with the 
Code-Making Panel 5 action on Proposal 5-119 relative to an exception for 
existing installations. This action will be considered by the panel as a public 
comment.
Substantiation: This is a direction from the National Electrical Code Technical 
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations 
Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the comment and has revised the text per the Technical 
Correlating Committee direction.
Revise 551.76(D) as shown in the ROP Draft to read as follows: 
"...for separately derived systems, and 250.32(B)(1) Exception for separate 
buildings."
Panel Statement: Under the direction of the Technical Correlating Committee, 
the panel has modified the text to correlate with the Panel 5 action on Proposal 
5-119.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-40 Log #363 NEC-P19  
(F551.80(B))  
Final Action: Accept

Submitter: Code-Making Panel 8, 
Committee on Proposal No: 19-105
Recommendation: CMP-8 recommends that CMP-19 Accept this proposal in 
Principle with the following revised text: 
"(B) Protection Against Physical Damage. Direct-buried conductors and 
cables entering or leaving a trench shall be protected by rigid metal conduit, 
intermediate metal conduit, electrical metallic tubing with supplemental 
corrosion protection, rigid, nonmetallic conduit, liquidtight flexible nonmetallic 
conduit, liquidtight flexible metal conduit, or other approved raceways or 
enclosures. Where subject to physical damage, the conductors or cables shall 
be protected by rigid metal conduit, intermediate metal conduit, or Schedule 
80 rigid nonmetallic PVC conduit. All such protection shall extend at least 450 
mm (18 in.) into the trench from finished grade."
Substantiation: CMP-8 recommends that CMP-19 Accept in Principle 
Proposal 19-105 with the following revised wording. The word "rigid" was 
also deleted in addition to "nonmetallic" to correlate with the action taken by 
CMP-8 on Proposal 8-53.
This comment has been balloted through CMP-8 with the following ballot 
results: 
12 Eligible to Vote
12 Affirmative
Mr. R. Loyd voted affirmatively stating: “Proposal 19-105 was to Accept. I 
agree with Mr. Burns' recommendation to revise the panel action.”

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

ARTICLE 552 PARK TRAILERS

19-41 Log #1276 NEC-P19  
(F552.48(L))  
Final Action: Reject

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 19-107
Recommendation: Accept the original proposal from the NEC TCC Task 
Group on Grounding and Bonding.
Substantiation: The NEC TCC Task Group on Grounding and Bonding agreed 
that simplification of the definitions was in order and that prescriptive elements 
would be proposed for specific Article texts as made in Proposal 19-107. The 
Task Group requests Panel 19 clarify and reconsider the Panel Action on this
This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee on National Electrical Code to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohia; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Panel Statement: The panel reaffirms its position as stated in the panel statement on Proposal 19-107.

This is identical to the language used in 406.5(B), and there is no need to be more prescriptive as to the method of grounding.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

19-42 Log #2214 NEC-P19 Final Action: Accept (552.60(B))

Submitter: Bruce A. Hopkins, RVIA
Comment on Proposal No: 19-112
Recommendation: Accept the original proposed language.
Substantiation: The proposed language is identical to the language approved by CMP-19 for recreational vehicles, 551.60(B) in the 1999 edition of the NEC (Reference 19-117, Log #660 - page 50 of the A98 ROP). The change in RY was permitted on the basis that many of the low-voltage DC components must be removed from the system prior to testing to prevent component damage and would be the same scenario during park trailer production.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Miller, T.

ARTICLE 553 FLOATING BUILDINGS

19-43 Log #230 NEC-P19 Final Action: Accept (553.9)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 19-114
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal relative to its action on Proposal 19-115. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the Technical Correlating Committee and continues to accept Proposal 19-114.
Panel Statement: See panel action and statement on Comment 19-44.
Number Eligible to Vote: 8
Ballot Results: Affirmative: 8

19-44 Log #231 NEC-P19 Final Action: Accept (553.9)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 19-115
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal relative to its action on Proposal 19-114. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction from the Technical Correlating Committee and subsequently rejects Proposal 19-115.
Panel Statement: Based on the action taken on Proposal 5-36 relative to the new definition of “Neutral Conductor”, it is the intent of the panel to retain the word “neutral”.
See the panel action and statement on Comment 19-43.
Number Eligible to Vote: 8
Ballot Results: Affirmative: 8

19-45 Log #232 NEC-P19 Final Action: Accept (555.1)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 19-116
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal at the public comment phase based on its technical merits. Although the Scope of NFPA 303 is limited to other than single family applications, there is no procedural reason why Code-Making Panel 19 cannot develop or apply electrical rules to single family applications if they desire to do so. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the Technical Correlating Committee to reconsider this proposal, and the panel continues to reject Proposal 19-116.
Panel Statement: The panel encourages the submitter of Proposal 19-116 to submit a proposal during the 2011 Code cycle that is more comprehensive and includes rationale for including and excluding specific requirements in this section necessary to provide the level of safety the submitter envisions.
Number Eligible to Vote: 9
Ballot Results: Affirmative: 9

19-46 Log #385 NEC-P19 Final Action: Accept in Principle in Part (555.9)

Comment on Proposal No: 19-117
Recommendation: Revise as follows: “555.9 Electrical Connections. electrical connections shall be located at least 305 mm (12 in.) above the deck of a floating pier. Conductor splices, within Type 6P junction boxes utilizing sealed wire connector systems listed for this application shall be permitted where located above the waterline, but below the electrical datum field for floating piers. All electrical connections shall be located at least 305 mm (12 in.) above the deck of a fixed pier, but not below the electrical datum plane.”
Substantiation: (a) The use of sealed, waterproof wire-to-wire splices in wet locations is common practice and allowed under the NFPA 70, section 110.14(B).
(b) These type of splices are located above the waterline on a floating dock/pier and are common practice applications in both direct burial and open bottom junction box (NON Type 6P junction boxes) conditions.
(c) It appears to be redundant to allow the use of approved water proof splices and then require these splices to be contained within Type 6P junction boxes.

THEREFORE:
Revise to like the wording “within Type 6P junction boxes” deleted.
Panel Meeting Action: Accept in Principle in Part
Revise the wording in the submitter’s recommendation to read as follows: “555.9 Electrical Connections. Electrical connections shall be located at least 305 mm (12 in.) above the deck of a floating pier. Conductor splices, within approved junction boxes, utilizing sealed wire connector systems listed and identified for submersion shall be permitted where located above the waterline, but below the electrical datum field for floating piers. All electrical connections shall be located at least 305 mm (12 in.) above the deck of a fixed pier, but not below the electrical datum plane.”
Panel Statement: The panel deleted the words “Type 6P” because a Type 6P box may not be needed in every case. However, a junction box suitable for the location is still required for splicing.
In lieu of the 6P box, the panel added the requirement for sealed wire connector systems to be listed and identified for submersion. Not all listed sealed wire connector systems provide the same degree of protection from moisture ingress.
Number Eligible to Vote: 9
Ballot Results: Affirmative: 9

19-47 Log #429 NEC-P19 Final Action: Reject (555.10(A) Exception (New))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 19-118
Recommendation: Accept the proposed exception.
Substantiation: Conduit bodies do not generally have external legs or ears for attachment screws. The last sentence infers that holes shall be drilled for attachment screws Conduit bodies are not always installed abutting a surface to which they can be attached by screws through the back. The panel statement
that these locations are more likely to be subject to damage is unsubstantiated opinion and should be judged by the AHJ. Conduit bodies under a pier or dock are somewhat protected and less likely exposed to physical damage.

Panel Meeting Action: Reject

Panel Statement: The submitter is correct in that conduit bodies under a pier or dock are somewhat protected and less likely exposed to physical damage. Likewise, conduit bodies installed above the deck level are more likely to be exposed to physical damage.

Since 555.10(A) deals with securing and supporting electrical equipment enclosures installed on piers above dock level, the original panel statement that these locations are more likely to be subject to damage is in agreement with the submitter’s substantiation.

No technical substantiation has been provided to justify allowing conduit to support electrical equipment enclosures.

The exception for 314.23(E) should not be allowed for these installations.

Number Eligible to Vote: 9
Ballot Results: Affirmative: 9

19-48 Log #1402 NEC-P19 Final Action: Accept (555.21)

Submitter: Leslie Sabin-Mercado, San Diego Gas & Electric Company

Comment on Proposal No: 19-127

Recommendation: Revise text of the 2005 NEC to read as follows:

555.21 Motor Fuel Dispensing Stations — Hazardous (Classified) Locations.

(A) General. Electrical wiring and equipment located at or serving motor fuel dispensers shall comply with Article 514 in addition to the requirements of this article. All electrical wiring for power and lighting shall be installed on the side of the wharf, pier, or dock opposite from the liquid piping system.


(B) Classification of Class I, Division 1 and 2 Areas.

The following criteria shall be used for the purposes of applying Tables 514.3(B)(1) and 514.3(B)(2) to motor fuel dispensing equipment on floating or fixed piers, wharfs or docks:

(1) Closed Construction. Where the construction of floating docks, piers, or wharfs is closed so that there is no space between the bottom of the dock, pier, or wharf and the water, such as concrete enclosed expanded foam, or similar construction, and having integral service boxes with supply chases:

(a) The space above the surface of the floating dock, pier, or wharf shall be a Class I, Division 2 location with distances as identified in Table 514.3(B)(1). Dispenser and Outdoor.

(b) The space below the surface of the floating dock, pier or wharf having areas or enclosures such as tubs, voids, pits, vaults, boxes, depressions, piping chases, or similar spaces where flammable liquid or vapor can accumulate shall be a Class I, Division 1 location.

Exception No. 1: Dock, pier, or wharf sections that do not support fuel dispensers and abut are 6.0 m (20 ft) or more from dock sections that support fuel dispensers shall be permitted to be Class I, Division 2 where documented air space is provided between dock sections to permit flammable liquids or vapors to dissipate and not travel to these dock sections. Such documentation shall comply with 500.4(A).

Exception No. 2: Dock, pier or wharf sections that do not support fuel dispensers and abut sections that support fuel dispensers shall be permitted to be unclassified where documented air space is provided and where flammable liquids or vapors can not travel to these dock sections. Such documentation shall comply with 500.4(A).

FPN: See 500.4(A) for documentation requirements.

(2) Open Construction. Where the construction of piers, wharfs, or docks is open, such as decks built on stringers supported by pilings, floats, pontoons or similar construction:

(a) The area 450 mm (18 in) above the surface of the dock, pier or wharf and extending 6.0 m (20 ft) horizontally in all directions from the outside edge of the deck or pier shall be a Class I, Division 1 location.

(b) Enclosures such as tubs, voids, pits, vaults, boxes, depressions, piping chases, or similar spaces where flammable liquids or vapors can accumulate with 6.0 m (20 ft) of the dispenser shall be a Class I, Division 1 location.

Substantiation: Panel 19 accepted Proposal 19-127 unanimously but determined that a task group be formed to address the technical merits of this proposal was in order. A Task Group comprised of members from CMP-19, CMP-19, CMP-14, NFPA 30A, NFPA 303, and the submitter of Proposal 19-127 met to discuss and coordinate the requirements of the proposal with those in Article 514, NFPA 303 and NFPA 30A. Refer to Task Group Member list attached.

The Task Group has added no new requirements to this proposal. The terms have been altered to align with NFPA 30A-2003, Motor Fuel Dispensing Facilities and Repair Garages, and NFPA 303-2000, Fire Protection Standard for Marinas and Boatyards; such as “docks, piers and wharfs”. The addition of these terms is not intended to expand the application of the requirements of the proposal but to be inclusive of various terms used to describe the same structure. Another phrase, “tubs, voids, pits, vaults, boxes, depressions, piping chases, or similar spaces where flammable liquids or vapors can accumulate” is borrowed from NFPA 30A for consistency between NFPA Standards. Metric dimensions have been included to meet the requirements of the NEC Style Manual. User-friendly language has been added to help the user correctly apply the requirements of Tables 514.3(B)(1) and Table 514.3(B)(2). The proposed exception was subdivided to clarify classification methods for dock sections that abut and for those that do not, so that the requirements of this section parallel those in 514.3. Two exceptions are added to provide a reasonable boundary for Class I, Division 1 and 2 areas. It is intended that these exceptions, along with other modified text, do not provide a new concept that is not contained in the Proposed or Article 514.

Panel Meeting Action: Accept

Number Eligible to Vote: 9
Ballot Results: Affirmative: 9

20-1 Log #1559 NEC-P20 Final Action: Reject (585 Title)

Submitter: Lawrence A. Bey, Cummins Power Generation

Comment on Proposal No: 20-1

Recommendation: Revise text to read as follows:

Change the title of Article 585 to Critical Operation Facilities.

Substantiation: This new article is located in Chapter Five, which is Special Occupancies. A power system is not an occupancy. The article covers more than just a critical operations power system.

Panel Meeting Action: Reject

Panel Statement: The panel rejects changing the title of the proposed article. See the panel action on Panel Comment CC-2000, which recommends relocating proposed Article 585, covering special conditions to the Chapter 7 of the NEC. The panel understands that location of articles in the NEC is the responsibility of the Technical Correlating Committee.

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-1a Log #CC2000 NEC-P20 Final Action: Accept (Article 585)

TCC Action: The Technical Correlating Committee directs that the Article be located as new Article 708.

Submitter: Code-Making Panel 20,

Comment on Proposal No: 20-1


Substantiation: CMP-20 recommends that the TCC move this article to Chapter 7 between Articles 705 and 720. The requirements of this article are more appropriately located in Chapter 7 covering special conditions because the systems within this article may apply to multiple areas or facilities at a particular site and not just to a single building or occupancy. A critical operations power system is a special condition, not a special occupancy.

Panel Meeting Action: Accept

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-1b Log #CC2001 NEC-P20 Final Action: Accept (585.1)

Submitter: Code-Making Panel 20,

Comment on Proposal No: 20-1

Recommendation: Add a new Fine Print Note No. 6 to 585.1 to read:

For further information regarding physical security see NFPA 730-2006, Guide for Premises Security.

Reidentify FPN No. 6 shown in the panel action on Proposal 20-1 as FPN No. 7.

Substantiation: The fine print note provides direction to information regarding physical security. This guidance will aid in application of 585.5. The panel understands that scope statements are under the purview of the Technical Correlating Committee and the panel recommends to the Technical Correlating Committee that this fine print note be located in 585.1 for consistency with the approach taken in Proposal 20-1 of locating the informational references to other documents in this section.

Panel Meeting Action: Accept

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-2 Log #2109 NEC-P20 Final Action: Accept in Principle (585.1)

TCC Action: The Technical Correlating Committee advises that article scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee accepts the panel action.

Submitter: Richard E. Loyd, Sun Lakes, AZ

Comment on Proposal No: 20-1

Recommendation: Revise text to read as follows:

1. General.

585.1 Scope. The provisions of this article apply to the electrical installation, operation, monitoring, control, and maintenance of critical operations power systems, and to the HVAC, Fire Alarm, Security, Communications and Signaling systems designated the DCOA or equipment consisting...
circuits and equipment intended to supply, distribute and control electricity to designated vital operations in the event of disruption to elements of the normal system. Critical operations power systems are those systems so classified by municipal, state, federal, or other codes, by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such a system. These systems include but are not limited to power systems, HVAC, fire alarm, security, communications and signaling for designated critical operations areas (DCOAs) in the event of disruption to elements of the normal system.

Substantiation: The proposed Scope is unclear and does not include the items listed in 585.14. I found it difficult to define the bounds of the article as written. I would assume that the intent is to cover certain equipment such as pumps in floor areas etc., as well as the DCOA. Which may be specially constructed concrete bunker of some type that is intended to withstand the expected disaster? 585.5 seems to be a performance requirement while 585.14 is prescriptive, but does not seem to assure compliance with the requirements in 585.5? It would seem that all of the wiring be required to meet 585.10(C)?

Consider identifying the performance requirements as such (see 250.4) and revise prescriptive requirements to meet them. I believe the proposed scope is concise and describes the proposed application of the article. Please consider.

Panel Meeting Action: Accept in Principle

The provisions of this article apply to the electrical installation, operation, monitoring, control, and maintenance of critical operations power systems consisting of circuits and equipment portions of the premises wiring system intended to supply, distribute and control electricity to designated critical operations areas (DCOAs) in the event of disruption to elements of the normal system. Critical operations power systems are those systems so classified by municipal, state, federal, or other codes, by any governmental agency having jurisdiction, or by facility engineering documentation establishing the necessity for such a system. These systems include but are not limited to power systems, HVAC, fire alarm, security, communications and signaling for designated critical operations areas.

Panel Statement: The panel acknowledges that the proposed wording of 585.1 Scope was unclear and would cause some confusion among users of this Code. The panel’s action clarifies that Article 585 applies to the electrical system supplying power to the critical operations facility and its related systems. The panel understands that article scopes are the responsibility of the Technical Correlating Committee and submits this change for TCC approval.

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-3 Log #1193 NEC-P20 Final Action: Reject

(585.1 Scope)


Comment on Proposal No: 20-1

Recommendation: Revise the Scope and Fine Print Notes of proposed Article 585 in Proposal 20-1 as follows:

585.1 Scope. The provisions of this article apply to the electrical installation—operation, monitoring, control, and maintenance of critical operations power systems consisting of circuits and equipment intended to supply, distribute and control electricity to designated vital operations in the event of disruption to elements of the normal system.

Critical operations power systems are those systems so classified by municipal, state, federal, or other codes, by any governmental agency having jurisdiction, or by facility engineering documentation establishing the necessity for such a system. These systems include but are not limited to power systems, HVAC, fire alarm, security, communications and signaling for designated critical operations areas.

FPN No. 1: Critical Operations Power Systems are generally installed in vital infrastructure facilities that, if destroyed or incapacitated, would disrupt national security, the economy, public health or safety; and where enhanced electrical infrastructure for continuity of operation has been deemed necessary.

FPN No. 2: For further information on disaster and emergency management see NFPA 1600-2004 edition, Standard on Disaster/Emergency Management and Business Continuity Programs.

Substantiation: 1) Material Outside the NEC Committee Scope: The scope of Article 585 is described by the Panel covering areas outside the Committee Scope of the National Electrical Code because it contains provisions for “operation, monitoring, control, and maintenance of critical operations power systems.” The Committee Scope of the National Electrical Code is printed on Page 22 of the 2005 NEC, the DCOA included as a spec for discussion is as follows:

Committee Scope: This Committee shall have primary responsibility for documents on minimizing the risk of electricity as a source of electric shock and as a potential ignition source of fires and explosions. It shall also be responsible for text to minimize the propagation of fire and explosions due to electrical installations.

The NEC Committee Scope applies to only the installation portion of the electrical system and not the operation, monitoring, control and maintenance of such systems based on a facility’s need as classified by the NEC Committee scope. Article 585 will have unwanted applications and will make these provisions unenforceable. Provisions for the operation, monitoring, control and maintenance of such systems should be placed in an Annex of the National Electrical Code.

2) Mandatory Requirements or Optional System: The wording of the second paragraph of the Article Scope seems to indicate that Critical Operations Power Systems (COPS) are classified by either a government agency having jurisdiction or by facility engineering documentation establishing the necessity for such a system. The text of the paragraph is included for discussion purposes below:

Critical operations power systems are those systems so classified by municipal, state, federal, or other codes, by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such a system.

The issue is the identification of which governmental agency will actually classify such systems. Also, can any engineer classify their electrical system or facility as a Critical Operations Power System?

Typically, the term “authority having jurisdiction” is widely accepted in the NFPA documentation and used in standards. In Edison Electric Institute’s opinion, this term should be the chosen term as the one to classify such systems. The wording of this paragraph (paragraph 2 of the Scope) as currently written eliminates some authorities such as the non-governmental ones with statistical authority such as the NIST. Also, any engineering documentation for a facility can classify the facility, or portion of such, as a critical operations power system. This action would further support the requirements of an optional system for those who choose to implement these requirements for their own use.

Article 585 is intended and written as a set of mandatory regulations. However in Edison Electric Institute’s opinion, the document may be best served as information in a Recommended Practice or an optional system. For example, 585.4 Risk Assessment outlines a requirement for conducting a risk assessment for critical power operations power systems including identifying the hazards, their likelihood of occurrence and the vulnerability of the electrical system to those hazards. Hazards are to be identified as naturally occurring and human-caused events.

Once the hazards are known by completing the Risk Assessment, a mitigation strategy addressing the results of the risk assessment is to be developed. Much of this appears in Article 517, but there is no provision for higher oversight and is subjective. The panel disagrees with the submitter’s comment that the National Electrical Code is precluded from including language requiring operation, control, monitoring, or maintenance of electrical systems. In numerous instances, including 700.1 and 701.2, currently in the Code scope statements include similar language. The panel acknowledges that this article addressed a wiring system that is absolutely vital to life safety and thus it is a language to require a higher oversight than previously included in the Code.

The panel also disagrees with the submitter’s comments concerning mandatory or optional. Article 585 is mandatory when a critical operations facility is designated by another party. This is a similar concept to Article 645 concerning information technology rooms where the regulations only apply under certain designated conditions. The example of the “investor-owned electric utility companies” is already addressed by 90.2(B)(3)c which excludes “installations under the exclusive control of an electric utility where such installations ... are on property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, transmission, or distribution of electric energy.” During construction of those facilities, the utility can request that Article 585 be used, which would then fall under the “facility engineering documentation establishing the necessity for such occupancy.”

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-4 Log #1156 NEC-P20 Final Action: Reject

(585.1 Scope)

Submitter: Lawrence A. Bey, Cummins Power Generation

Comment on Proposal No: 36-1

Recommendation: Revise text to read as follows:

The provisions of this article shall apply to the electrical installation, operation, monitoring, control, and maintenance of critical operations facilities that are intended to remain operational and/or occupied in the event of a disaster and both naturally occurring and manmade. The requirements of this article not only apply to single function buildings but are also intended to be individually applied to a critical operation facility within a multifunction building. Critical operations facilities are those facilities so classified by municipal, state, or federal agencies having jurisdiction and authority.

Substantiation: The article covers more than just a critical operations power systems, such as requirements found in 585.4, 585.14, and 585.64; and the scope needs to be broadened to cover those special occupancy requirements. This article should only address governmental mandated facilities and not those that result from engineering documentation. Federal engineering documentation is not defined and minimum requirements for the documentation are not established. The proposed scope statement was modeled on Article 517 for a facility instead of Article 700 for a power system.
Panel Meeting Action: Reject
Panel Statement: See the panel actions on Comment 20-1a and Comment 20-2.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-5 Log #1561 NEC-P20 Final Action: Reject (585.4)
Submitter: Lawrence A. Bey, Cummins Power Generation
Comment on Proposal No: 20-1
Recommendation: Delete this section.
Substantiation: Risk assessment outside the scope of the NEC. Risk assessment is addressed by 585.1 FPN No. 2 which calls out NFPA 1600 as a referenced document.
Panel Meeting Action: Reject
Panel Statement: The panel disagrees that risk assessment is outside the scope of this Code. There are numerous instances where outside information necessary to enforce code provisions is required, including testing of ground-fault protection of equipment in 230.95 and performance of ground rods in 250.56. Due to the high degree of reliability that the wiring system for a critical operations area is required to meet, an assessment of potential hazards is vital to ensure proper minimum requirements for a safe and reliable installation. Article 585 does not designate which facilities are classified as critical to operations, nor does it designate what types of hazards the electrical system must withstand that is the purpose of the risk assessment.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-6 Log #1562 NEC-P20 Final Action: Reject (585.5(1))
Submitter: Lawrence A. Bey, Cummins Power Generation
Comment on Proposal No: 20-1
Recommendation: Delete 585.5 and 585.5(1).
Substantiation: The requirement for a strategy for physical security is a vague and unenforceable requirement of an electrical installation.
Panel Meeting Action: Reject
Panel Statement: The panel disagrees that risk assessment is outside the scope of this Code. There are numerous instances where outside information necessary to enforce code provisions is required, including testing of ground-fault protection of equipment in 230.95 and performance of ground rods in 250.56. Due to the high degree of reliability that the wiring system for a critical operations area is required to meet, an assessment of potential hazards is vital to ensure proper minimum requirements for a safe and reliable installation. Article 585 does not designate which facilities are classified as critical to operations, nor does it designate what types of hazards the electrical system must withstand that is the purpose of the risk assessment.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-6a Log #CC2002 NEC-P20 Final Action: Accept (585.5(A))
Submitter: Code-Making Panel 20,
Comment on Proposal No: 20-1
Recommendation: Revise 585.5(A) to read:
Based on the results of the risk assessment, a strategy for providing physical security for critical operations power systems shall be developed, documented, and implemented.
Substantiation: Adding the word “documented” clarifies the intent that a written risk assessment strategy be in place.
Panel Meeting Action: Accept
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-7 Log #1822 NEC-P20 Final Action: Reject (585.10(B))
Submitter: Richard E. Loyd, Sun Lakes, AZ
Comment on Proposal No: 20-1
Recommendation: Revise text to read as follows:
585.10(B) Wiring. Wiring of two or more COPS circuits supplied from the same source shall be permitted in the same raceway, cable, box, or cabinet. Wiring outside of the DCOA from a COPS source or COPS source distribution overcurrent protection equipment shall be identified by a distinctive color or marking and be kept entirely independent of all other wiring and equipment.
Substantiation: It is vitally important for all COPS components outside the DCOA to be easily distinguishable from the other electrical power, control and communications components.
Panel Meeting Action: Reject
Panel Statement: The panel rejects the recommendation to identify the COPS wiring methods that are installed outside the DCOA because of the the unique security risks that may be associated with such identification. Identifying such circuits in these areas could facilitate the exception needs to be retained because it is necessary to have the COPS wiring system in the transfer switch enclosure with the wiring from the normal source and alternate source.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-8 Log #2207 NEC-P20 Final Action: Reject (585.10(C)(1)(1))
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 20-1
Recommendation: Revise the text as follows:
(c) Rigid Metal Conduit, Intermediate Metal Conduit, Electrical Metallic Tubing, Type MI cable or Schedule 80 rigid nonmetallic conduit.
Substantiation: Electrical Metallic Tubing (EMT) is the logical wiring method for many of the applications in these areas. COPS circuits will undoubtedly be routed through ceiling spaces and other locations where they will not be subject to severe physical damage. The text in 585.10 (C) (1) (1) appears to be modeled after the text in 517.30 (3) Mechanical Protection of the Emergency System. This text allows the use of “nonflexible metal raceways” which includes EMT. There is no allowance for the use of EMT anywhere in 585.10 (C) (1). This is a robust wiring method allowed for use where not subject to “severe physical damage”. Some of the other nonmetallic raceways such as 585.10 (C) (1) such as Schedule 40 rigid nonmetallic conduit and metallic cable assemblies are not allowed at all where subject to any type of physical damage.
Panel Meeting Action: Reject
Panel Statement: The panel intends that COPS feeder wiring be installed in raceways suitable for exposure to severe physical damage or otherwise protected from severe physical damage.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-8a Log #CC2003 NEC-P20 Final Action: Accept (585.10(C)(1)(1) and 585.10(C)(1)(2))
Submitter: Code-Making Panel 20,
Comment on Proposal No: 20-1
Recommendation: Revise 585.10(C)(1)(1) by removing “Schedule 80 rigid nonmetallic conduit”.
Revise 585.10(C)(1)(2) to read:
Where encased in not less than 50 mm (2 in.) of concrete any of the following wiring methods shall be permitted:
a. Schedule 40 or Schedule 80 Rigid Polyvinyl Chloride Conduit (Type PVC)
b. Reinforced Thermosetting Resin Conduit (Type RTRC)
c. Electrical Metallic Tubing (Type EMT)
d. Flexible nonmetallic or jacketed metal raceways
Je. Jacketed metallic cable assemblies listed for installation in concrete
Substantiation: The panel has removed Schedule 80 from 585.10(C)(1)(1) because it is necessary to use metal wiring methods for physical protection in order that the fire protection required by 585.10(C)(2) also can be provided. The panel has added RTRC nonmetallic conduit to 585.10(C)(1)(2) based on the Panel 8 action to separate that type of nonmetallic raceway into a separate article. The panel has also added electrical metallic tubing to 585.10(C)(1)(2) because with 2 inches of concrete encasement the raceway is provided the intended physical and fire protection for the contained conductors. The panel action to permit nonmetallic raceways only where they are installed within concrete encasement provides the enhanced level of physical protection that is necessary for feeder circuits supplying mission critical loads.
Panel Meeting Action: Accept
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

20-9 Log #2208 NEC-P20 Final Action: Accept (585.10(C)(3))
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 20-1
Recommendation: Revise text as follows:
(3) Floodplain Protection. Where COPS feeders are installed below the level of the 100-year floodplain, the circuit conductors shall be listed for use in wet locations.
Substantiation: (3) Floodplain Protection. Where COPS feeders are installed below the level of the 100-year floodplain, the circuit conductors shall be listed for use in wet locations and be installed in a wiring method that is permitted for use in wet locations.
585.14 (1) Signal and communication wires shall use shielded twisted pairs, be installed in any of the metal conduits installed in accordance with 585.10(C)
and 585.14(7) Riser communication cables shall be 2-hour fire resistive cables or a listed 2-hour electrical circuit protective system. 585.14(8) Control, monitoring, and power wiring to HVAC systems shall be 2-hour fire resistive cables or a listed 2-hour electrical circuit protective system. 585.14(9) Where used with sources that are not electrically operated and mechanically held, automatic transfer switches shall be electrically operated and mechanically held. Substantiation: There has been no substantiation presented that equipment failure is an issue where appropriately rated and installed electrical equipment is used. The proposed text only requires a transfer switch to listed, which is only one of many solutions for transferring power to alternate sources. Multiple switchboards from multiple manufacturers are often employed in large facilities to control the power from multiple power sources. It is not reasonable to require such an installation to have equipment that is specifically listed for transfer or paralleling of sources. The panel should reconsider the lack of substantiation for this requirement and consider the broader applications of products that control the electrical system. The panel must consider the restriction being placed on the user by requiring a specific transfer switch which inherently will exclude safe and possibly equivalent metallic tubing, whether intentional or accidental. The word “conduit” was replaced with “raceway” in 585.14 in the event that our proposal to change Article 585.24(C) to add Electric Metallic Tubing is accepted. EMT is usually not included under the definition of “conduit” but EMT and the other conduits listed in 585.10(C)(1)(1) are all raceways.
This page contains a discussion on the importance of selective coordination in electrical systems, particularly in critical operations power systems (COPS). The panel agreed to include new text for public comment on the issue of selective coordination and the implications of selectivity in electrical systems. The recommendation was to delete proposed Article 585.54, which would require the selective coordination of all overcurrent devices. The panel discussed the challenges and limitations of the 2005 National Electrical Code (NEC) in addressing these issues, and the need for more selective coordination to enhance reliability and safety in COPS systems.

The panel also addressed the concerns raised by the voltage drop, voltage interlocking, and arc-flash energy resulting from the larger equipment used to achieve selective coordination. The panel recommended that the action taken on this proposal be reconsidered, as it is significant for the electrical industry. The panel further emphasized the importance of keeping the power on and the role of selective coordination in maintaining system reliability and personnel safety.

The panel statement concluded with a recommendation to reject the proposal, as the panel action to reject the wording would provide the appropriate latitude for the system engineer to make the correct engineering decision without a legal mandate that each device be selective. The panel discussed the necessity for all devices to be evaluated in order to ensure selective coordination is provided by all overcurrent protective devices.
However, to improve clarity, usability and for consistency is may be appropriate for the TCC to place the same exceptions in Article 585 as accepted by CMP-13 for two overcurrent devices of the same size in series, and for devices on the primary and secondary of a transformer.

The argument that a selectively coordinated system creates other safety hazards is without merit. NFPA 70E requires an electrically safe work condition and recognizes energized work only where the task is infeasible or deenergization would create a greater hazard. Arc reduction maintenance switches and current limiting overcurrent protective devices can also be used in the system design to reduce arc flash energy for energized work when it is infeasible or a greater hazard to deenergize.

GE does not support the mandate for Selective Coordination for ALL current ranges and ALL overcurrent devices because safety and reliability can both actually be enhanced. A solution based on the use of size-matched overcurrent protective devices on the primary and secondary of a transformer.

In many instances it may not be possible to meet the requirements for generator protection provided by an overcurrent device located on or near the generator and provide selective coordination with downstream overcurrent devices. Further, the generator protection functions provided within the engine-generator control panel and the manufacturer may not be able to selectively coordinate with downstream overcurrent devices.

The paralleling of generators is often done to enhance system reliability, which is the stated objective of the CMP, however, in order to meet the requirement for selective coordination each generator overcurrent device and controller must selectively coordinate with all downstream overcurrent devices. This may not be possible if the generators are of unequal size.

The upgrade or expansion of an existing building may require the replacement of existing upstream equipment so that it will selectively coordinate with the new downstream equipment it must feed. The State of Washington has recognized the significant economic burden this is placing on building owners and businesses and has issued an emergency order exempting existing buildings from meeting the selective coordination requirements of the 2005 NEC.

Systems are normally designed for selective coordination in the overload region of the overcurrent device time-current curves. If this were not so, they would not operate under normal conditions, so what is really being called for in this case is overload short circuit selective coordination in order to achieve total short circuit selective coordination, the size of upstream overcurrent protective devices may need to be increased and/or time delay trip characteristics increased, thereby possibly increasing the arc flash hazard. In other words, by forcing selective coordination for an event that most likely will never occur, namely a bolted fault, the hazards involved in performing tasks which most likely will occur, namely system maintenance, may be increased. This is another reason why system designers need the flexibility to optimize the design of a system, which the current requirement does not allow.

Further, we wish to point out the following:

1. The need for the flexibility to optimize the design of a system is recognized in IEEE Standard 242-2001 (The Buff Book). Section 15.1 states, "In applying protective devices, it is occasionally necessary to compromise between protection and selectivity. While experience may suggest one alternative over another, the preferred approach is to favor protection over selectivity. Which choice is made, however, is dependent on the equipment damage and the affect on the process."

2. The need for the flexibility to optimize the design of a system is also recognized in NFPA 110-2005, Standard for Emergency and Standby Power Systems. Section 6.5.1 states, "The overcurrent protective devices in the EPS system are coordinated to provide both protective devices when a short circuit occurs. A further explanation of this statement is given in Annex A section A.6.5.1, "It is important that the various overcurrent devices be coordinated, as far as practicable, to isolate faulted circuits and to protect against cascading operation on short circuit faults. In many systems, however, full coordination is not practicable without using equipment that could be prohibitively costly or undesirable for other reasons."

3. This NEC text conflicts with Chapter 27 of the International Building Code that specifically requires compliance with NFPA 110 for emergency systems. This presents a conundrum for the system designer and the AHI. Which code takes precedence, the IBC or the NEC?

In summary, GE strongly supports selective coordination as a valuable safety asset in the current range where overloads most often occur. However, GE does not support the mandate for Selective Coordination for ALL current ranges and ALL overcurrent devices because safety and reliability can both actually be enhanced, thus the section should be deleted.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 20-13.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16


20-15 Log #2228 NEC-P20 Final Action: Reject (585.54)

Submitter: Kevin J. Lippert, Eaton/Cutler-Hammer

Comment on Proposal No: 20-1

Recommendation: Disagree with the panel action. Recommend that the text in 585.54 be deleted in its entirety.

Substantiation: Eaton strongly supports selective coordination as a valuable safety asset in the current range where overloads most often occur. However, there are circumstances where overcurrent devices (both fuses and circuit breakers) are selected specifically to coordinate across ALL current ranges. This may not be possible if the generators are of unequal size. The CMP-20 could choose to make this an FPN, similar to the 2002 NEC FPN to 700.25, with advice that selective coordination MAY increase overall reliability of the system.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 20-13.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16


70-352
Submitter: Alan Manche, Square D Company

Comment on Proposal No: 20-11

Recommendation: Include the phase loss text in Mr. Carroll’s affirmative comment and revise text to read:

585.56 Phase Loss. All ungrounded service or feeder conductors of the circuit shall be automatically opened during an overcurrent condition. In such a situation, which would leave two thirds of these loads energized. Protection for individual branch-circuit three-phase motor loads has been addressed since the 1971 NEC(R) began requiring three overcurrent relays and there are other means that can be deployed. Solid state overload and solid state devices as well as additional phase loss relays are optionally available for branch circuits where enhanced protection is warranted for specific critical motor circuits.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

CARROLL, J.: I am casting an affirmative vote in support of the panel action as there was a lack of substantiation for the panel to consider the necessity of including such a requirement in this article. My greatest concern is the panel statement fails to consider the aspects of protecting critical sensitive electrical loads such as communication equipment and computers that will be necessary to ensure a critical operations facility remains operational during an emergency. This article has included a number of performance requirements that include selectivity and fire protection, it should also consider power quality issues (first consideration single phasing in this case) that would damage the equipment necessary to support emergency needs.

As a manufacturer and partner in designing numerous mission-critical environments, single phasing is an extremely critical from a performance standpoint. Consider the response of the UPS to single phasing. Single-phasing of the rectifier input supply to a static UPS, for example, will typically cause the UPS to begin supplying power to the critical load from its stored-energy source (typically batteries). Single-phasing of the UPS output can cause the UPS to start attempting to balance the load, which can result in UPS overload. The preservation of the load then becomes dependent upon the over-all topology of the system and the availability of the respective overcurrent protective device. For example, a three pole molded case circuit breaker is not designed to open to protect against single phasing damage caused by an open winding in an upstream transformer.

The proposed text as written would literally guarantee that all power for lighting, communications and every other function critical to those types of Fine Print Notes, CMP 3 should continue to reject this FPN. Failure to do so would mean adding Fine Print Notes for IEC, EII, IBEW, IAEC, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others

ARTICLE 590 TEMPORARY INSTALLATIONS

3-82 Log #736 NEC-P03 Final Action: Accept (590.2(C))

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 3-111

Recommendation: Continue to Reject

Substantiation: Continue to Reject. The addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as a substantiation to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is inappropriate. The TCC, a standard with 90.C, was a writer-wrangled for precluding these types of Fine Print Notes. CMP 3 should continue to reject this FPN. Failure to do so would mean adding Fine Print Notes for IEC, EII, IBEW, IAEC, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others
when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

### Panel Meeting Action: Accept

#### Number Eligible to Vote: 13

#### Ballot Results: Affirmative: 12 Negative: 1

#### Explanation of Negative:

MAASSEN, R.: See my Explanation of Negative Vote on Comment 3-86.

3-83 Log #737 NEC-P03

(590.2(C))

#### Final Action: Accept

**Submitter:** Robert Kelleher, Paramount Electrical Services

**Comment on Proposal No:** 3-110

**Recommendation:** Continue to Reject

**Substantiation:** Continue to Reject. The addition of these NECA Fine Print Notes, serves no beneficial purpose to the user of the National Electrical Code. These Fine Print Notes are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. A total of sixteen new Fine Print Notes were proposed to reference NECA standards. ALL were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The TCC should intervene to prohibit these types of Fine Print Notes. CMP-3 should continue to reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEL, ACC, NETA, NEI, SEIA, ASI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

**Panel Meeting Action: Accept**

**Number Eligible to Vote: 13**

**Ballot Results: Affirmative: 12 Negative: 1**

**Explanation of Negative:**

MAASSEN, R.: See my Explanation of Negative Vote on Comment 3-86.

3-84 Log #845 NEC-P03

(590.2(C) (New))

#### Final Action: Accept

**Submitter:** John P. Masarick, Independent Electrical Contractors Inc.

**Comment on Proposal No:** 3-110

**Recommendation:** The panel is encouraged to continue to Reject Proposal 3-110.

**Substantiation:** The reasons to continue to Reject the Proposal are as follows:

1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

**Panel Meeting Action: Accept**

**Number Eligible to Vote: 13**

**Ballot Results: Affirmative: 12 Negative: 1**

**Explanation of Negative:**

MAASSEN, R.: See my Explanation of Negative Vote on Comment 3-86.

3-85 Log #846 NEC-P03

(590.2(C))

#### Final Action: Accept

**Submitter:** John P. Masarick, Independent Electrical Contractors Inc.

**Comment on Proposal No:** 3-111

**Recommendation:** The panel is encouraged to continue to Reject Proposal 3-111.

**Substantiation:** The reasons to continue to Reject the Proposal are as follows:

1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These reasons to continue to Reject the Proposal are as follows:

1) Understands the revisions to Section 590.4(D) have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives.
2) Concludes that the proposed revision as worded for 590.6(B)(2)(a) provides good clarification and properly identifies the specific conductor referred to in this section. The specific grounding conductor referenced in this rule is the equipment grounding conductor which accomplishes the grounding and provides an effective ground-fault current path for operation of protective devices supplying the equipment. This prescriptive language can only make the provision required by OSHA 1926.404 more effective. The Task Group does not agree that this change would affect OSHA’s acceptance of this prescriptive method of protection. The intent of this grounding is to facilitate operation of protective devices in the situation of a ground fault. The wording proposed by the Task Group is consistent with prescriptive requirements in 250.114, 250.138, 406.3(C), and 590.4(D) referenced in 590.6(B)(2).

3-87 Log #1203 NEC-P03

(590.4(D) and 590.6 (B)(2)(a))

#### Final Action: Accept

**Submitter:** Neil F. LaBrake, Jr., Syracuse, NY

**Comment on Proposal No:** 3-35

**Recommendation:** 1) The NEC TCC Grounding and Bonding Task Group agrees with the CMP-5 editorial revisions to Section 590.4(D).
2) The NEC TCC Grounding and Bonding Task Group recommends that CMP-3 reconsider accepting the existing proposed text for Section 590.6(B)(2)(a).

**Substantiation:** The NEC TCC Grounding and Bonding Task Group:

1) Understands the revisions to Section 590.4(D) have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives.
2) Concludes that the proposed revision as worded for 590.6(B)(2)(a) provides good clarification and properly identifies the specific conductor referred to in this section. The specific grounding conductor referenced in this rule is the equipment grounding conductor which accomplishes the grounding and provides an effective ground-fault current path for operation of protective devices supplying the equipment. This prescriptive language can only make the provision required by OSHA 1926.404 more effective. The Task Group does not agree that this change would affect OSHA’s acceptance of this prescriptive method of protection. The intent of this grounding is to facilitate operation of protective devices in the situation of a ground fault. The wording proposed by the Task Group is consistent with prescriptive requirements in 250.114, 250.138, 406.3(C), and 590.4(D) referenced in 590.6(B)(2).
Exception: 30A-125V and 125/250V receptacles on portable generators, The proposed addition of 590.8 in Proposal 3-131, properly deals with the wiring system from a portable alternate power supply.” Since this proposed consist of those that are permanently installed in their entirety, including operation of optional standby systems. The systems covered by this article alternate power supplies as follows:

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-88 Log #1633 NEC-P03 Final Action: Accept (590.6)


Comment on Proposal No: 3-125

Recommendation: This Proposal should continue to be Accepted.

Substantiation: This proposal eliminates a possible misunderstanding of the current text of the NEC. The intent of the section is to make sure that all persons on a construction site are protected by a ground fault circuit interrupter regardless of the source of power. The addition of this text adds clarity to this section.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-89 Log #890 NEC-P03 Final Action: Reject (590.6(B) Exception)

Submitter: Paul Schnackenberg, Gen/Tran Corp.

Comment on Proposal No: 3-129

Recommendation: Revise as follows:

Exception: 30A-125V and 125/250V receptacles on portable generators, when used for home standby systems with approved transfer switches, and temporary wiring, shall not be required to have GFCI protection for these specific receptacles.

Substantiation: Add to substantiation provided: In searching through catalogs, tool supply outlets and rental companies, no tools have been found using a 30A-125V plug. The only use of a 125/250V receptacle on a construction site is to power a “Spider Box” which already have GFCI protection. Combining all of the leakage in a spider box will cause nuisance tripping in genset GFCI.

Panel Meeting Action: Reject

Panel Statement: While the substantiation has provided additional text regarding the use of spider boxes and protection on construction sites, the text in the exception still deals with portable generators connected for use as home standby systems. The panel reiterates its statement from the proposal as follows: Section 590.6 only applies to temporary power to equipment used by personnel during construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities. This proposed text more appropriately belongs in Article 702 since the proposal is addressing portable generators used for optional standby power for a dwelling unit.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-90 Log #1148 NEC-P03 Final Action: Reject (590.8 (New))


Comment on Proposal No: 3-131


Substantiation: Requirements of Article 702 apply to the installation of optional standby systems that are permanently installed in their entirety and not for temporary installations. The specific requirements for temporary installations in 590.2, 590.3, and 590.4 should cover the temporary connection of portable generators.

The proposed addition of 590.8 in Proposal 3-131, properly deals with the “temporary connection of portable generators”, and has additional requirements that are not covered under the provisions of Article 702.

Panel Meeting Action: Reject

Panel Statement: The scope of Article 702 was changed to include portable alternate power supplies as follows:

“702.1 Scope. The provisions of this article apply to the installation and operation of optional standby systems. The systems covered by this article consist of those that are permanently installed in their entirety, including prime movers, and those that are arranged for a connection to a premises wiring system and a portable alternate power supply.” Since this proposed text provides requirements for connection of portable generators to permanent premises wiring, the text more appropriately belongs in Article 702, not in Article 590.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

ARTICLE 600 ELECTRIC SIGNS AND OUTLINE LIGHTING

18-95a Log #CC1800 NEC-P18 Final Action: Accept (600.7)

Submitter: Code-Making Panel 18, Comment on Proposal No: 18-123

Recommendation: Revise the Panel Action in Proposal 18-123 to read: 600.7 Grounding and Bonding

(A) Grounding.

(1) Equipment Grounding. Signs and metal equipment of outline lighting systems shall be grounded by connection to the equipment grounding conductor of the supply branch circuit(s) or feeder using the types of equipment grounding conductors specified in 250.118. Exception: portable cord-connected signs shall not be required to be connected to the equipment grounding conductor where protected by a system of double insulation or its equivalent. Double insulated equipment shall be distinctively marked.

(2) Size of Equipment Grounding Conductor. The equipment grounding conductor size shall be in accordance with 250.122 based on the rating of the overcurrent device protecting the branch circuit or feeder supplying the sign or equipment.

(3) Connections. Equipment grounding conductor connections shall be made in accordance with 250.130 and in a method specified in 250.8.

(4) Supplementary Grounding Electrode. Supplementary grounding electrode(s) shall be permitted for electric signs and outline lighting systems covered by this article and shall meet the requirements of 250.54.

(5) Metal Building Parts. Metal parts of a building shall not be permitted as a secondary return conductor or an equipment grounding conductor.

(B) Bonding.

(1) Bonding of Metal Parts. Metal parts and equipment of signs and outline lighting systems shall be bonded together and to the equipment grounding conductor of the branch circuit or feeder supplying the sign or outline lighting system and shall meet the requirements of 250.90.

(2) Bonding Connections. Bonding connections shall be made in accordance with 250.8.

(3) Metal Building Parts. Metal parts of a building shall not be permitted to be used as a means for bonding metal parts and equipment of signs or outline lighting systems together or to the equipment grounding conductor of the supply circuit.

(4) Flexible Metal Conduit Length. Listed flexible metal conduit or listed liquidtight flexible metal conduit that encloses the secondary circuit conductor from a transformer or power supply for use with neon tubing shall be permitted as a bonding means if the total accumulative length of the conduit in the secondary circuit does not exceed 30 m (100 ft).

(5) Small Metal Parts. Small metal parts not exceeding 50 mm (2 in.) in any dimension, not likely to be energized and spaced at least 19 mm (3/4 in.) from neon tubing shall not require bonding.

(6) Nonmetallic Conduit. Where listed nonmetallic conduit is used to enclose the secondary circuit conductor from a transformer or power supply and a bonding conductor is required, the bonding conductor shall be installed separate and remote from the nonmetallic conduit and be spaced at least 38 mm (1 1/2 in.) from the conduit when the circuit is operated at 100 Hz or less or 45 mm (1 3/4 in.) when the circuit is operated at over 100 Hz.

(7) Bonding Conductors. Bonding conductors shall comply with (a) and (b):

(a) Bonding conductors shall be copper and not smaller than 14 AWG.

(b) Bonding conductors installed external of a sign or raceway shall be protected from physical damage.

(8) Signs in Fountains. Signs or outline lighting installed inside a fountain shall have all metal parts and bonded to the equipment grounding conductor of the branch circuit for the fountain recirculating system. The bonding connection shall be as near as practicable to the fountain and shall be permitted to be made to metal piping systems that are bonded in accordance with 680.53. FPN: Refer to 600 32(J) for restrictions in length of high-voltage secondary conductors.

Substantiation: This revision to 600.7 addresses the recommendation or a portion of the recommendation in Comments 18-96, 18-97, 18-98,18-99,18-100, and 18-101. The panel concurs with the TCC Grounding and Bonding Task Group recommendation that the specific references to sections within Article 250 are necessary to ensure compliance. The panel added titles where necessary to comply with the NEC Style Manual and also modified 600.7(B)(1) and 600.7(B)(3) to clarify that all metal parts (other than as exemptions in 600.7(B)(5)) of a sign or outline lighting are to be bonded to the equipment grounding conductor of the supply circuit. The panel clarified the protection of a bonding conductor installed external to a sign or outline lighting system.

70-355
Grounding.

Metal Building Parts. Metal parts of a building shall not be permitted as bonding connections if the total accumulative length of the conductor in the building system does not exceed 30 m (100 ft). Small Metal Parts. Small metal parts not exceeding 50 mm (2 in.) in any dimension, not likely to be energized and spaced at least 19 mm (3/4 in.) from neon tubing shall not require bonding. Nonmetallic Conduit. Where listed nonmetallic conduit is used to enclose the secondary circuit conductor from a transformer or power supply and a bonding conductor is required, the bonding conductor shall be installed separate and remote from the nonmetallic conduit and be spaced at least 38 mm (1 1/2 in.) from the conduit when the circuit is operated at 100 Hz or less or 45 mm (1 3/4 in.) when the circuit is operated at over 100 Hz.

Bonding Conductors. Bonding conductors shall comply with (a) and (b).
(a) Bonding conductors shall be copper and not smaller than 14 AWG.
(b) Bonding conductors installed external of a sign or raceway shall be protected from physical damage.

Signs in Fountains. Signs or outline lighting installed inside a fountain shall have all metal parts and equipment grounding conductors bonded to the equipment grounding conductor of the fountain recirculating system. The bonding connection shall be as near as practicable to the fountain and shall be permitted to be made to metal piping systems that are bonded in accordance with 600.53.

FPN: Refer to 600.32(J) for restrictions in length of high-voltage secondary conductors.

Substantiation: This comment is an effort to provide editorial revisions to the proposal by inserting titles to the list items in 600.7(A)(1), 600.7(B)(1) and 600.7(B)(2). The suggested revisions of 250.54 provide clarity and improve usability of this section as revised. This comment does not introduce new requirements and is intended as an editorial adjustment only.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Panel Comment 18-95a (Log #70/C1800).

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Final Action: Accept in Principle in Part (600.7)


Comment on Proposal No: 18-123

Recommendation: Revise the panel action to read as follows:

(A) Grounding.
(1) Signs and metal equipment of outline lighting systems shall be grounded in accordance with Article 250 Part VI and Part VII by connection to the equipment grounding conductor of the branch circuit for the fountain recirculating system. The bonding connection shall be as near as practicable to the fountain and shall be permitted to be made to metal piping systems that are bonded in accordance with 680.53. Exception: Portable cord-connected signs shall not be required to be connected to the equipment grounding conductor where protected by a system of double insulation or its equivalent. Double insulated equipment shall be distinctively marked.

(2) The equipment grounding conductor size shall be in accordance with 250.132 based on the entire circuit including the transformer or power supply and the branch circuit. Bonding connections shall be made to metal piping systems that are bonded in accordance with 680.53 or a method specified in 250.8.

(3) Connections. Equipment grounding conductor connections shall be made in accordance with 250.120 and in a method specified in 250.8.

(4) Supplementary Grounding Electrode. Supplementary grounding electrode(s) shall be permitted for electric signs and equipment of outline lighting systems covered by this article and shall meet the requirements of 250.54.

(5) Metal Building Parts. Metal parts of a building shall not be permitted as a secondary return conductor or an equipment grounding conductor.

(B) Bonding.
(1) Metal parts and equipment of signs and outline lighting systems shall be bonded together and to the associated transformer or power supply equipment grounding conductor of the branch or feeder circuit(s) or feeder and shall meet the requirements of Article 250 Part V 250.90.

(2) Bonding connections shall be made in accordance with 250.8.

(3) Metal Building Parts. Metal parts of a building shall not be permitted to be used as a means for bonding metal parts and equipment of signs or outline lighting systems together or to the transformer or power supply equipment grounding conductor.

(4) Flexible Metal Conduit Length. Listed flexible metal conduit or listed liquidtight flexible metal conduit that encloses the secondary circuit conductor from a transformer or power supply for use with neon tubing shall be permitted as a bonding means if the total accumulative length of the conduit in the secondary circuit does not exceed 30 m (100 ft).

(5) Small Metal Parts. Small metal parts not exceeding 50 mm (2 in.) in any dimension, not likely to be energized and spaced at least 19 mm (3/4 in.) from neon tubing shall not require bonding.

(6) Nonmetallic Conduit. Where listed nonmetallic conduit is used to enclose the secondary circuit conductor from a transformer or power supply and a bonding conductor is required, the bonding conductor shall be installed separately and remote from the nonmetallic conduit and be spaced at least 38 mm (1 1/2 in.) from the conduit when the circuit is operated at 100 Hz or less or 45 mm (3/4 in.) when the circuit is operated at over 100 Hz.

(7) Bonding Conductors.
(a) Bonding conductors shall be copper and not smaller than 14 AWG.
(b) Bonding conductors required by 600.7(B)(6) to be installed external separately from the conduit shall be protected from physical damage.

(8) Signs in Fountains. Signs or outline lighting installed inside a fountain shall have all metal parts and bonded to the equipment grounding conductor of the branch circuit for the fountain recirculating system. The bonding connection shall be as near as practicable to the fountain and shall be permitted to be made to metal piping systems that are bonded in accordance with 680.53.

FPN: Refer to 600.32(J) for restrictions in length of high-voltage secondary conductors.

Substantiation: Should the panel elect to continue with partial cross-references to specific portions of Article 250 (Note: see submitter’s other comment on 18-123 which addresses the error of this action), then the cross-reference should be to complete parts of the article rather than select sections. Highlighting through cross-reference to a few select sections, while ignoring other applicable sections of a part of Article 250 increases the potential for errors and misunderstanding in the application of the code.

This comment also includes changes in (A)(1), (A)(4), (B)(1), (B)(3) and (B)(7) to better clarify the intent and improve usability.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Panel Comment 18-95a (Log #C18100).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13
This Comment was developed by a Task Group assigned by the NEC.

KIEFFER, S.: See my explanation of negative vote on Comment 18-99.

KIEFFER, S.: Proposals 18-123 and 18-124 were not submitted to CMP-clarity and continue to be consistent with the Grounding and Bonding Task Group proposal 18-125 as modified and revised by the actions of CMP-18.

Submitter: (600.7)

Panel Meeting Action: Accept
Neil F. LaBrake, Jr.

Number Eligible to Vote: 13
Balloon Results: Affirmative: 13

18-99 Log #1268 NEC-P18
Final Action: Accept
(600.7)

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 18-123
Recommendation: Continue to accept the TCC Grounding and Bonding Task Group proposal 18-123 as modified and revised by the actions of CMP-18.

Substantiation: The CMP-18 revisions to the proposal have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives. The NEC style manual does permit references to specific sections in 4.1.1 and in this instance the TG feels the references are appropriate and 90.3 affirms that all of Chapters 1 thru 4 do apply. The references in this article are to draw specific attention to relevant sections.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 13
Balloon Results: Affirmative: 12 Negative: 1

Explanation of Negative:
KIEFFER, S.: Proposals 18-123 and 18-124 were not submitted to CMP-18 by the TCC Grounding and Bonding Task Group. It was submitted by an individual. In this proposal that individual did not claim to represent the task group or his employer.

See also my explanation of negative vote on Comment 18-95a.

18-100 Log #1270 NEC-P18
Final Action: Accept
(600.7)

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 18-124
Recommendation: Continue to accept the TCC Grounding and Bonding Task Group proposal 18-124 as modified and revised by the actions of CMP-18.

Substantiation: The CMP-18 revisions to the proposal have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives. The NEC style manual does permit references to specific sections in 4.1.1 and in this instance the TG feels the references are appropriate and 90.3 affirms that all of Chapters 1 thru 4 do apply. The references in this article are to draw specific attention to relevant sections.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 13
Balloon Results: Affirmative: 13

18-101 Log #1558 NEC-P18
Final Action: Accept
(600.7)

Submitter: Neil F. LaBrake, Jr., Syracuse, NY
Comment on Proposal No: 18-125
Recommendation: Continue to accept the TCC Grounding and Bonding Task Group proposal 18-125 as modified and revised by the actions of CMP-18.

Substantiation: The CMP-18 revisions to the proposal have been made for clarity and continue to be consistent with the Grounding and Bonding Task Group’s original initiatives. The NEC style manual does permit references to specific sections in 4.1.1 and in this instance the TG feels the references are appropriate and 90.3 affirms that all of Chapters 1 thru 4 do apply. The references in this article are to draw specific attention to relevant sections.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 13
Balloon Results: Affirmative: 12 Negative: 1

Explanation of Negative:
KIEFFER, S.: See my explanation of negative vote on Comment 18-99.

18-102 Log #220 NEC-P18
Final Action: Accept
(600.12)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 18-133
Recommendation: It was the action of the Technical Correlating Committee that this proposal be sent to Code-Making Panel 3 for comment regarding the use of Class 2 wiring methods without there being a Class 2 power supply. This action will be considered by the panel as a public comment.

Substantiation: Just limiting the power source to less than 50 volts does not cover the power sources that may exceed the current limitations outlined in Tables 11(A) and 11(B) in Chapter 9. For example, 725.21 permits Class 1 power limited circuits to be 30 volts and 1000 volt-amperes with a current rating of 33.33 amps. Where a power-limited Class 1 power source is other than a transformer, the maximum output or V x Amps can be as high as 2500 volt-amperes with a current peak of 83.33 amps. Obviously, a Class 2 wiring method would not be acceptable for circuits with amperage and volt-ampere levels in these ranges.

This comment has been balloted through CMP-3 with the following ballot results:

13 Eligible to Vote
11 Affirmative
1 Negative
1 Not Returned (L. Sleights)

Mr. S. Egesdal voted negatively stating: “The apparent intention of the revision to 600.12 is to be able to use Class 2 and Class 3 wiring methods. It is important for the installation of Class 2 and Class 3 cable to comply with Part I and Part III of Article 725. The references in the text proposed by the Task Group only refer to selected sections in Part III of Article 725. Local authorities inspecting an installation could have concern for Class 2 and Class 3 cables not installed in compliance with Part I, such as 725.8 Electrical Execution of Work and 725.10, Class 1, Class 2, and Class 3 Circuit Identification. Where other articles use Class 2 and Class 3 wiring methods, it is important that all the relevant requirements of Article 725 are met.

Suggestion: Change 600.12(C)(2) to: “Class 2 and Class 3 wiring methods shall be permitted where installed in compliance with Part I and Part II of Article 725.”

Mr. M. Sanders voted affirmatively stating: “Change the second sentence of (C) to read as follows: “Secondary circuit wiring less than 50 volts shall be installed in accordance with any one of the following”.” There are only two methods permitted, so the choice is between one of them or the other. Because the choices stated are for two different conditions, the user should not be left with the impression that both can be used at the same location unless that is the intent, in which case it should be made more clear.”
Panel Meeting Action: Accept
Panel Statement: Panel 18 confirms that it is their intent to use Class 2 power supplies and wiring methods that are installed in accordance with 725.41 and 725.52. Article 600 has never prohibited the use of the circuits and wiring methods covered within the scope of Article 725.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-104 Log #1198 NEC-P18 Final Action: Accept (600.24)

Comment on Proposal No: 18-139
Recommendation: Revise the panel action on 600.24 as follows: 600.24 Class 2 Power Sources.

Signs and outline lighting systems supplied by Class 2 transformers, power supplies, and power sources shall comply with the applicable requirements of Article 600 and all of the following:
(A) Listing. Class 2 Power Supplies and Power sources shall be listed for use with electric signs and outline lighting systems and shall comply with 725.41.
(B) Grounding. Systems shall be grounded where required by 250.20(A).
(C) Secondary Wiring. Secondary wiring from Class 2 power sources shall comply with 600.12(C).

Substantiation: 250.20(A) enables ungrounded AC systems below 50 volts. This provision of Chapter 2 has been modified by 600.7 which requires grounding of all signs and outline lighting. Therefore, 250.20 should not be referenced as that reference results in an apparent conflict with 600.7 and the second sentence of 600.24(C).
The reference to 250.112 should be deleted as this is a circular reference because 250.112 sole function is to reference 600.7.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-105 Log #1196 NEC-P18 Final Action: Accept (600.32(A)(1))

TCC Action: The Technical Correlating Committee directs that this section be revised to delete the term “rigid nonmetallic conduit” to be consistent with other actions taken in the NEC and to revise the text to comply with the NEC Style Manual.

The Technical Correlating Committee understands that the panel meeting action on Comment 18-105 supplements the panel actions on Proposals 18-146 and 18-148 to read as follows:
“(A) Installation. Conductors shall be installed in rigid metal conduit, intermediate metal conduit, PVC conduit, RTRC, liquidtight flexible nonmetallic conduit, flexible metal conduit, liquidtight flexible metal conduit, electrical metallic tubing, metal enclosures, on insulators in metal raceways, or in other equipment listed for use with neon secondary circuits over 1000 volts.”
Comment on Proposal No: 18-148
Recommendation: Revise text to read:
600.32(A)(1): Conductors shall be installed on insulators, in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, liquidtight flexible conduit, stainless steel conduit, flexible metal conduit, liquidtight flexible metal conduit, electrical metallic tubing, metal enclosures, or other equipment listed for use with neon secondary circuits over 1000 volts and shall be installed in accordance with the requirements of Chapter 3.
Substantiation: The subject of 600.32 is neon secondary circuits. I believe the submitter’s intent was to identify the specific purpose, for neon secondary circuits, as opposed to requiring a general high-voltage listing, which would be an extensive expansion of the requirements.
No substantiation was provided to support imposing the requirements for high-voltage general wiring on neon secondary circuits.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-106 Log #221 NEC-P18 Final Action: Accept (600.32(F))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 18-151
Recommendation: The Technical Correlating Committee directs that the Panel reconsider and correlate their actions on this proposal with Proposal 18-152. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Revise 600.32(F) to read:
Insulators and Bushings. Insulators and bushings for conductors shall be listed for use with neon secondary circuits over 1000 volts.
Panel Statement: The panel concludes that their action on Proposal 18-151 was in error. The correct action should be to “Accept in Principle” with a panel statement of “See panel actions and proposal on Proposal 18-152.” This action is also correlates with the action on Comment 18-105.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

18-107 Log #222 NEC-P18 Final Action: Accept (600.32(F))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 18-153
Recommendation: Accept the proposal and revise 600.32(G) to read:
(1) Conductors in Raceways.
(2) Damp or Wet Locations:
- In damp or wet locations, where GTO conductors extend not less than 100 m (1 in.) beyond the metal conduit or tubing.
- In dry locations, the insulation on all conductors shall extend not less than 65 min (2 1/2 in.) beyond the metal conduit or tubing.
Substantiation: Electrode enclosures required by 600.42 are listed under UL 879 Standard for Sign Components for damp and wet locations and include requirements that the GTO cable be enclosed.
The demonstration samples of GTO submitted at the panel meeting were not subject to failure testing while the GTO was inside of a required enclosure. They were not tested in an installation that complies with the code or with the applicable UL standards. The samples appearance of failure can only be ascertained by an open circuit to ground, power by a transformer or power supply that does not have the required secondary-circuit ground-fault protection.
UL is presently conducting a fact-finding investigation of GTO cable. In analyzing this proposal and the opposition to the proposals it is important to keep in mind that a hazard would only exist as a result of multiple concurrent failures; a neon tube must break; the listed electrode enclosure required in 600.42 and the UL required GTO enclosure must both fail thus exposing the bare conductor at the splice to wet conditions and grounded metal; and the secondary-circuit ground-fault protection required in 600.23 must fail to perform and allow a continuous short to ground. It is only if all four of those fault conditions exist that GTO insulation performance might become an issue.
Additionally, the Panel’s actions in Proposals 18-146; 18-154; and 18-158 collectively eliminate any instances where GTO can be installed in a wet location external from an electrical enclosure.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Accept
Panel Statement: The panel notes that the “t” in “the” should be capitalized at the beginning of the sentence.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3

Explanation of Negative:
OWENS, T.: I continue to oppose the removal of the 4 inch requirement for wet locations. A report of a study by UL was presented just prior to the panel meeting. I concede that the report did provide documentation about the reaction of GTO cable in a pristine environment that would seem to support the Sign Industry proposal and comment. However, questions were raised about the validity of the report to actual installations situations. Included within the report was a statement by the engineer that the absence of contamination was a detriment to causing arc-tracking. Every installation of outline lighting is subject to contamination of the surface of the GTO due to dust in the air, exterior environmental conditions, and poor maintenance of the installation also, the report did not take into account of the different electrical conditions created by the presence of capacitive coupling created where the GTO exists a conductor. These two omissions provide sufficient concern to retain the current requirements.
Another issue that was raised during this meeting was that the 4 inch requirement was being required under the UL standards for signs and components. This NEC section addresses only the installation of neon secondary-circuit conductors in field installed skeleton tubing or, by 600.12 field-installed wiring of section signs. Therefore, the NEC language does not apply to any wiring contained within a listed electric sign. The subject report should be submitted to the standards bodies for their action.
The first application occurs when GTO exits conduit or tubing at the face of the building wall, interior or exterior, and continues in open air following the wiring method “conductors on insulator” (600.32(A)) to the connection with the neon tube electrodes. That connection is most commonly made by a twisted wire connection as allowed by 600.42(B). That connection point must be in a listed enclosure (600.42(B)), this is the wiring method most referenced when someone complains about GTO failures. However, with almost 100 percent certainty I can declare that those referenced wet-location failures will be non-code-compliant installations. Why? Because the applicable UL Standard #879 requires that the listed wet location enclosures required by 600.42(B) include enclosures listed for the electrical connection that GTO enclosure to the conduit or tubing. Therefore in a code-compliant wet-location installation the GTO cannot be exposed to open-air and weather.

CMP-18’s action this cycle have further reinforced this requirement by: 1) Approving the sign industry’s proposal to delete conductor on insulator as an approved wiring method for all locations. 2) Added 600.42 (A) Points of Transition. Where the high voltage secondary circuit conductors emerge from the wiring methods specified in 600.32(A), they shall be enclosed in a listed assembly. This reinforces the requirements in UL 879 and make the requirement applicable to all locations: wet, damp and dry.

Therefore, it can be concluded that installations involving exposed GTO are no longer allowed by the code or the applicable UL standard. Wet-location exposed GTO is no longer allowed by the code.

The second and third application of 600.32(G) occurs when GTO exits conduit or tubing in another raceway or in an enclosure. The most common occurrence of this condition involve conduit connected to a large metal raceway which contains other conductors, such as a splice enclosure, or conductors and equipment such as a transformer or power supply.

There certainly are confusion caused by the definitions, and overlap between the code definitions of a raceway and an enclosure, verse the sign industry definition which lumps both into a single category, and UL standards for the sign industry which treat them in an identical manner. The code further compounds this confusion by stating that a fabricated metal raceway may contain equipment, thus physically meeting the definition of an enclosure.

Regardless of the definition confusion, the practical application has been to apply the spacing requirements of 600.32(G) to the inside of metal raceways and enclosures at any point where conduit or tubing is connected to the enclosure or raceway. This requirement is considered to be applicable any time GTO exits conduit or tubing. Regardless of whether it is a raceway or enclosure, the requirements for “conductors in raceways” are applied. This application of the requirements of 600.32(G) will continue and is the basic concern being addressed by the sign industry’s proposal, comment, and the UL fact-finding investigation.

The UL fact-finding investigation was specifically designed to create a wet-location failure of the insulation in order to determine whether or not there was a performance difference in UL listed GTO when installed with the code required 2 1/2 in. dry location spacing versus the 4 in. wet location spacing. The fact-finding investigation determined that there is no performance difference. This is the panel question regarding the proper test.

The fact-finding investigation was not a test of the reliability or suitability of GTO insulation that conforms to the requirements of the code. The test is not intended to question the validity of the UL standard or the code requirement for this wire.

It is important to recognize that the fault protection device, in this case secondary-circuit fault-protection, was bypassed.

The primary purposes of insulation are to protect conductors from physical damage, such as corrosion, and to maintain electrical separation, the separation of conductors by means of nonconductors so as to prevent the transfer of electricity during normal operations. Conductor insulators are not intended to always maintain electrical separation and protect electric circuits during major fault conditions. Fault protection devices exist for this purpose. It is important to recognize that conductors and equipment such as a transformer or power supply in these circuits do not include an internally wired connection between the primary and secondary coils. Therefore, a secondary fault will not trip the primary circuit protector.

The UL tests for GTO failure. It was a performance test. The test sequence was not complete until UL found a failure condition. That does not mean there is anything wrong with this product. The failure was induced solely for purposes of measuring the difference in performance, if any, with a change in spacing. It is important to note that UL has stated they have not received field complaints regarding GTO listed under the current standard. Therefore, it appears reasonable to conclude that any reported failures of neon circuits must involve factors other than the insulation on GTO wire, or must be installations that are not code compliant.

This test should be considered to be no different than taking a general wire product, such as THHN insulated wire, and spraying water on it until it shorts to ground. While simultaneous the circuit is under test, the circuit is tested. The test would also fail the test. Such a failure would be much more dramatic than what was seen with GTO in a neon secondary circuit. Such a test would have no bearing on the code requirements for conductors. The vast majority of insulation used on conductors would fail such testing. Further, it should be pointed out that CMP-18, in ROP 18-146, deleted approval of the conductor on insulator wiring method, and when combined with ROP 18-154 and 18-158 eliminates any instance where GTO can be wired exposed to a wet location. The conductor must always be enclosed.

The further application remained for 600.32(G) is when GTO exits conduit or tubing in another raceway or in an enclosure. At times, the applicable UL standard will treat the inside of such enclosures as if they were damp location. The UL test for GTO wire already addresses damp location along with the water immersion conditioning requirements that must occur before some of these tests.

The FFI does not support the need for extra spacing for damp and wet locations. Therefore, it is proper to approve the comments and allow a single spacing dimension to be applicable with the knowledge that the net results of all of the code changes the panel has approved is the elimination of any instances where GTO can be installed in a wet location; it must always be enclosed.

ARTICLE 604 MANUFACTURED WIRING SYSTEMS

19-49 Log #708 NEC-P19 Final Action: Accept in Principle in Part (604.6 and 604.7 New)

TCC Action: The Technical Correlating Committee understands that Proposal 19-131 is being reported as “hold” in addition to the portion of the comment that was held by the panel. The only revision that will be made to the NEC from this comment is the addition of the following text: “604.7 Installation. Manufactured wiring systems shall be secured and supported in accordance with the applicable table or conduit article for the described or conduit type employed.”

Since the panel held the requirement for listing, the Technical Correlating Committee also understands that the addition of UL 183 to Annex A will be “held” as well.

Submitter: Dean Negrelli, Wiremold/Legrand

Comment on Proposal No: 19-131

Recommendation: The Panel should continue to accept in principle and revise the ROP draft text as follows:

Listed or Approved Requirements. Manufactured wiring systems shall be listed, manufactured wiring systems shall be manufactured wiring systems or shall be constructed in accordance with 604.7.

FPN: One method of determining applicable requirements for listing of manufactured wiring systems is to refer to ANSI/UL 183-2004, Standard for Manufactured Wiring Systems.

604.6 Construction. Manufactured wiring systems which are not listed manufactured wiring systems shall be constructed in accordance with (A), through (E).

(A) Wiring Methods. Manufactured wiring systems shall be listed as manufactured wiring systems or shall be constructed in accordance with (1), (2), or (3).

---FPN: One method of determining applicable requirements for listing of manufactured wiring systems is to refer to ANSI/UL 183-2004, Standard for Manufactured Wiring Systems.---
Report on Comments A2007 — Copyright, NFPA

1. The FPN was moved to Annex A. (See the panel action on Comment 19-50.)

2. Move existing 604.6(E) to become new 604.7 as follows:

   “604.7 Installation. Rated manufacturing systems shall be secured and supported in accordance with the applicable cable or conduit article for the cable or conduit type employed.”

3. The panel is holding “604.6, Listing Requirements” and “604.6(A) Construction. Manufactured wiring systems that are not listed manufactured wiring systems shall be constructed in accordance with (A) through (E),” based on the action taken on Comments 19-51, 19-52, and 19-53.

   The remaining text is accepted in principle based on the actions taken on Comments 19-55 and 19-56.

   Panel Statement: 1. The FPN was moved to Annex A by the action taken on Comment 19-50.

   2. This action is a clarification that this is an installation requirement, rather than a type of construction, and does not belong under 604.6.

   3. See the panel action and statement on Comments 19-55 and 19-56.

   Number Eligible to Vote: 8

   Ballot Results: Affirmative: 7 Negative: 1

   Explanation of Negative: LICHTENSTEIN, T.: The panel action should be to accept in principle and in part and make the changes noted in 1 and 2 below:

   1. The FPN was moved to Annex A Comment 19-50.

   2. The installation section should be moved from 604.6(E) to 604.8.

   The remainder of the test document Comment 19-49 should be accepted. Proposal 19-131 should not be held until the 2011 cycle. See my negative to Comment 19-51.

   Holding over this proposal and applicable comments until the 2011 Code cycle is unnecessary and should not be permitted. The panel members have had 11 months to make all discussions to Article 604 and no new substantiation has been provided that would meet the criteria for a hold as detailed in the NFPA Rules and Regulations Governing Committee Projects as follows: 4.4.6.2.2. Hold. It shall hold for processing as a proposal for the next revision cycle a comment that:

   (a) Would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

   (b) Would change the text proposed by the TC to the point that the TC would have to restudy the text of the Report on Proposals or other affected parts of the document.

   (c) Would propose something that could not be properly handled within the time frame for processing the report.

   4.4.6.2.3 Basis for Hold. In determining whether to hold a comment pursuant to 4.4.6.2.2, the TC may consider any relevant factors including, but not limited to, the extent to which the comment proposes a change that is new and/or substantial, the complexity of the issues raised, and whether sufficient debate and public review has taken place.

   Comment on Affirmative: EWING, M.: For clarity: The Panel is holding the Submitter’s comment language regarding “604.6, Listing Requirement” and “604.7 Construction.

   MCNEIVE, T.: It is appropriate to hold this comment until 2011 NEC Cycle. The submitter of proposal 19-131 has UL non-compliance with longstanding requirements in Section 604.6(A)(2) as the fundamental substantiation for suggesting expanded permission to list manufactured wiring systems constructed of “nonstandard” components presently required to be themselves listed according to Section 604.6 (A)(1), (2) and (3). Code-making Panel 16 has traditionally been cautious in expanding the application and construction for manufactured wiring systems. The ramifications of the proposed change is potentially far reaching and deserves more thoughtful consideration and perhaps inputs from code-making panels having jurisdiction over the conduits and wiring systems covered by Section 604.6(A)(1), (2) and (3).

19-50 Log #233 NEC-P19 Final Action: Accept

   “TCC Action: The Technical Correlating Committee understands that the reference will not be added to Annex A since the requirement for listing was held through the action on Comment 19-49.

   Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 19-131

   Recommendation: It is the opinion of the Technical Correlating Committee that the proposal reconsider the proposal and move the FPN reference to the product standard in Annex A. The NEC Style Manual requires that product standards references appear in Annex A. This action will be considered by the panel as a public comment.

   Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

   Panel Meeting Action: Accept

   The panel accepts the recommendation of the Technical Correlating Committee to reconsider the proposal, and the panel moves the product standard reference in 604.6(A) to Annex A.

   Panel Statement: This action is taken under the direction of the Technical Correlating Committee and to be consistent with the NEC Style Manual. The panel notes that this product standard reference already exists in Annex A.

   Number Eligible to Vote: 8

   Ballot Results: Affirmative: 8

19-51 Log #475 NEC-P19 Final Action: Hold

   “TCC Action: The Technical Correlating Committee understands that the reference will not be added to Annex A since the requirement for listing was held through the action on Comment 19-49.

   Submitter: Gregory J. Steinman, Thomas & Betts Corporation Comment on Proposal No: 19-131

   Recommendation: Change the panel action to Reject.

   Substantiation: The comments accompanying Mr. Bernson’s and Mr. McNeive’s negative votes should be considered by the CMF and the CMP’s action reconsidered.

   Panel Meeting Action: Hold

   The panel is holding Proposal 19-131.

   Panel Statement: Proposal 19-131 seeks to amend 604.6(A) to include an option that listed manufactured wiring systems be permitted to be made from components that they are not listed as required presently in 604.6(A)(1), (2) and (3). The submitter’s substantiation is based on past practice by Underwriter’s Laboratories that, by the submitter’s admission, is in conflict with the present requirement in 604.6(A)(2).

   ANSI/UL 183-2004, Manufactured Wiring Systems, is cited in the proposal as “One method for determining applicable requirements for listing of manufactured wiring systems.” The scope of this standard states: “The products covered under this standard are to be installed in accordance with Article 604 of the National Electrical Code, ANSI/NFPA 70.” Yet, this standard contains provisions that allow manufactured wiring systems to be listed without conformance to 604.6(A)(2).

   Code panel members are concerned about the precedent that it might set in accepting the proposal with this substantiation and some panel members are concerned about the ability of all nationally recognized testing laboratories to consistently apply the subjectivity of the scope requirements permitted to be considered in UL 183.

   Holding further action on Proposal 19-131 and related comments until the 2011 Code cycle will enable further evaluation, by panel members, of the system for managing and applying the requirements in UL 183 and the impact of such a broad change.

   Number Eligible to Vote: 8

   Ballot Results: Affirmative: 7 Negative: 1

   Explanation of Negative: LICHTENSTEIN, T.: The panel action should be to reject Comment 19-51. Holding over this proposal and applicable comments until the 2011 Code cycle is unnecessary and should not be permitted. The panel members have had 11 months to make all discussions to Article 604 and no new substantiation has been provided that would meet the criteria for a hold as detailed in the NFPA Rules and Regulations Governing Committee Projects as follows: 4.4.6.2.2. Hold. It shall hold for processing as a proposal for the next revision cycle a comment that:

   (a) Would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

   (b) Would change the text proposed by the TC to the point that the TC would have to restudy the text of the Report on Proposals or other affected parts of the document.

   (c) Would propose something that could not be properly handled within the time frame for processing the report.
4.4.6.2.3 Basis for Hold. In determining whether to hold a comment pursuant to 4.4.6.2.2, the TC may consider any relevant factors including, but not limited to, the extent to which the comment proposes a change that is new and/or substantial, the complexity of the issues raised, and whether sufficient debate and public review has taken place.

Proposal 19-131 should be accepted per the ROP ballot. Proposal 19-131 seeks to require that Manufactured Wiring Systems be listed as a Manufactured Wiring System to UL 183, the Standard for Manufactured Wiring Systems or be constructed in accordance with the Listed cables and conduits detailed in 604.6(A). UL 183, the Standard for Manufactured Wiring Systems, has very specific requirements for investigating conduits for equivalency to a Listed conduit. The requirements detailed in Section 7.4 are specifically written so that misinterpretation of the requirements by other certification organizations is highly unlikely but is the concern of some panel members. The requirements from UL 183 are below:

“7.4 Flexible metal conduit, liquid-tight flexible metal conduit, or liquid-tight flexible nonmetallic conduit shall comply with the Standard for Flexible Metal Conduit, UL 1, the Standard for Liquid-Tight Flexible Steel Conduit, UL 360, or the Standard for Tight Flexible Nonmetallic Conduit, UL 1669.

Exception: Flexible metal conduit is not required to comply with UL specified construction dimensions under the following conditions:

a) Trade sizes of 9/16-inch and 5/8-inch oval shaped and flexible metal conduit shall comply with the 1/2-in trade size performance requirements in UL 1, and trade size of 3/8-inch reduced wall flexible conduit shall be provided with internal and external diameters as specified in Table 7.1. All other construction and performance requirements shall be in accordance with UL 1.

b) All mating fittings and connector assemblies used with conduit specified in (a) shall be factory installed.

c) The flexible metal conduit in (a) shall be subjected to follow up evaluation on performance testing in accordance with UL 1 on the indicated trade sizes.”

The only permitted deviation is the shape and maximum outer diameter of the conduit. This permits for different shape conduits and sizes to reduce the bending radius and increase the flexibility of the conduit for ease of installation of manufactured wiring systems. The TC members have had 11 months to study the impact of this change to Article 604 and no new substantiation has been provided that wold meet the criteria for a hold as detailed in the NFPA Rules and Regulations Governing Committee Projects as follows:

4.4.6.2.3 Basis for Hold. It shall hold for processing as a proposal for the next revision cycle a comment that:

a) Would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

b) Would change the text proposed by the TC to the point that the TC would have to restudy the text of the Report on Proposals or other affected parts of the document.

c) Would propose something that could not properly handled within the time frame for processing the report.

4.4.6.2.3 Basis for Hold. In determining whether to hold a comment pursuant to 4.4.6.2.2, the TC may consider any relevant factors including, but not limited to, the extent to which the comment proposes a change that is new and/or substantial, the complexity of the issues raised, and whether sufficient debate and public review has taken place.

Comment on Affirmative:


Panel Meeting Action: Hold

Panel Statement: See the panel action and statement on Comment 19-51.

Number Eligible to Vote: 8

Ballet Results: Affirmative: 7 Negative: 1

Explanation of Negative:

LICHTENSTEIN, T.: The panel action should be to reject. See my negative for Comment 19-51. Holding over Proposal 19-131 and applicable comments until the 2011 code cycle is unnecessary and should not be permitted. The Panel members have had 11 months to study the impact of this change to Article 604 and no new substantiation has been provided that would meet the criteria for a hold as detailed in the NFPA Rules and Regulations Governing Committee Projects as follows:

4.4.6.2.3 Basis for Hold. It shall hold for processing as a proposal for the next revision cycle a comment that:

a) Would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

b) Would change the text proposed by the TC to the point that the TC would have to restudy the text of the Report on Proposals or other affected parts of the document.

c) Would propose something that could not properly handled within the time frame for processing the report.

Affirmative: 7 Negative: 1

Further: 7 Negative: 1
Submitter: Linda J. Little, St. Louis, MO

Recommendation: This proposal should be Rejected.

Substantiation: Although the general rules in Chapters 1 through 4 may be modified in Chapter 6, there should be a substantial reason for doing so, and in this case there is not. 330.108 requires Type MC cable to comply with 250.118(10) where it is used for equipment grounding, and 250.118(10) requires Type MC cable to be “listed and identified for grounding.” The new language in 604.6(A)(1)b) and c) “Listed Type MC Cable,” is not consistent with language in 250.118(10).

Additionally, “The grounding conductor and armor assembly identified as acceptable ground paths” in 604.6(A)(1)c) does not meet the “listed and identified for grounding” requirement in 250.118(10).

If, as the submitter states, the ground path of this cable does in fact provide an effective ground fault current path before and after physical performance testing, there should be no reason why this cable cannot be listed and identified for grounding. It is inappropriate to modify the general rules in this code to allow a nonlisted product when other listed products are readily available.

Panel Meeting Action: Reject

Panel Statement: The substantiation states that the cable in the proposal is not listed and identified for grounding.

This cable is listed and identified for grounding.

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

Panel Statement: See the panel action and statement on Comment 19-56.

The panel rejects the redundant reference to 250.122. Chapters 1 through 4 apply generally, unless modified by this section. In addition, this section does contain modified sizing requirements for the equipment grounding conductor, and there is no technical subcommittee action to warrant a change.

The panel rejects the combining of (2) and (3) and the renumbering as the submitter requests, because these changes do not add clarity. The subdivisions and numbering in the original proposal comply with the NEC Style Manual.

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

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Submitter: James Daly, Upper Saddle River, NJ

Recommendation: The panel action should be to Accept in Principle in Part and modify the Proposal as follows:

(2) Listed Type MC cable containing nominal 600 V, 8 to 12 AWG insulated copper conductors with an aluminum grounding conductor and armor assembly listed and identified for grounding in accordance with 250.118(10). The aluminum grounding conductor and armor assembly shall have a current-carrying capacity equivalent to the ungrounded copper conductor.

Substantiation: Articles 320 (Type AC) and 330 (Type MC) do not require the cables to be listed. 250.118(10) makes the requirement of Type MC cable where listed and identified for grounding in accordance with the following: “to be used as an equipment grounding conductor. Addition of the word “containing” and making volt singular provides consistency with a, b, and c. and provides clarity. While the Type MC cable may not be listed, if the grounding conductor and armor assembly are to be used for grounding, it must comply with 250.118(10). The revision in the last sentence is for clarity.

Panel Meeting Action: Accept in Principle in Part

Revise the wording in Proposal 19-133, 604.6(A)(1)a), b), and c), to read as follows:

“(1) Listed Type AC cable containing nominal 600 V, 8 to 12 AWG insulated copper conductors with a bare or insulated copper equipment grounding conductor equivalent in size to the ungrounded conductor.

(2) Listed Type MC cable containing nominal 600 V, 8 to 12 AWG insulated copper conductors with a bare or insulated copper equipment grounding conductor equivalent in size to the ungrounded conductor.

(3) Listed Type MC cable containing nominal 600 V, 8 to 12 AWG insulated copper conductors with a grounding conductor and armor assembly listed and identified for grounding as acceptable ground paths in accordance with 250.118(10) and sized in accordance with 250.122, bare or insulated copper equipment grounding conductor equivalent in size to the ungrounded conductor.

Substantiation: Articles 320 (Type AC) and 330 (Type MC) do not require the cables to be listed. 250.118(10) does require “Type MC cable where listed and identified for grounding in accordance with the following:” to be used as an equipment grounding conductor.

Combining (2) and (3) will still accomplish the Submitter’s objective while eliminating additional text. The rewording of (2) will permit copper or aluminum grounding conductor(s), either individually or in conjunction with an aluminum or copper metallic sheath to be used as the equipment grounding conductor provided it complies with 250.118(10) [listed and identified] and is sized in accordance with 250.122. The change from “600-volt” to “600 V” is in accordance with the Standard Terms and Units of Measurement in Annex B of the NEC Style Manual.

Panel Meeting Action: Accept in Principle in Part

The panel accepts the principle of changing “600-volt” to “600 V”, and the inclusion of “grounding conductor and armor assembly listed and identified for grounding in accordance with 250.118(10).” The panel rejects the remainder of the comment.
Add: Neutral conductors that comply with 310.15(B)(4)(a) shall not be counted as current-carrying which exempt neutrals that comply with 310.15(B)(4)(a). The original panel action in the ROP took into account the NEC TCC Task Group on Grounding and Bonding's original initiative that "bonding jumper" as defined in Article 100 is the proper use of the term. This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than "accept" taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

The last sentence that was added by the panel “Portable means for adding a lock to the switch or circuit breaker shall not be permitted.” Will prohibit the use of portable devices that provide for the attachment of multiple locks (i.e. Scissors) to the locking mechanism. The sentence should be removed.

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

Comment on Proposal No: 12-1

Recommendation: Revise text to read as follows:

“The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.”

Comment on Affirmative:

QUAVE, D.: The new language will clarify the fact that the additional language was not meant to prohibit the use of Lock out/Tag out devices, but assures that there will be a place to install the Lock out/Tag out device.

Panel Meeting Action: Accept

Revise the sentence that reads “Portable means for adding a lock to the switch or circuit breaker shall not be permitted.” of committee action on Proposal 12-9 to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.”

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 12-1

Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and clarify if their revisions are to the recommendation or the existing code text. This action will be considered by the panel as a public comment.

Panel Meeting Action: Accept

Revise text to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted.”

Comment on Proposal No: 12-2

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 12-4

Recommendation: Revise text to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted.”

Panel Meeting Action: Accept

Revise 620.82 and 680.83, to read as follows:

620.82 Electric Elevators. For electric elevators, the frames of all motors, elevator machines, controllers, and the metal enclosures for all electrical equipment in or on the car or in the hoistway shall be bonded in accordance with Article 250, Parts V and VII.

620.83 Nonelectric Elevators. For elevators other than electric having any electric conductors attached to the car, the metal frame of the car, where normally accessible to persons, shall be bonded in accordance with Article 250, Parts V and VII.

Panel Meeting Action: Accept

Revise 620.82 and 680.83, to read as follows:

620.82 Electric Elevators. For electric elevators, the frames of all motors, elevator machines, controllers, and the metal enclosures for all electrical equipment in or on the car or in the hoistway shall be bonded in accordance with Article 250, Parts V and VII.

620.83 Nonelectric Elevators. For elevators other than electric having any electric conductors attached to the car, the metal frame of the car, where normally accessible to persons, shall be bonded in accordance with Article 250, Parts V and VII.

Panel Statement: The panel accepts the TCC direction and has added the required parts in 620.82 and 680.83.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-2 Log #529 NEC-P12 Final Action: Reject

(610.14(A))

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 12-4

Recommendation: Accept the proposal as revised:

Add: Neutral conductors that comply with 310.15(B)(4)(a) shall not be required to be counted in determining allowable ampacities.

Substantiation: 310.15(B)(4)(a) permits the neutral not to be counted as current-carrying. Tables 310.15(B)(2)(a), 310.16, and 310.18 headings use the phrase “current-carrying” which exempt neutrals that comply with 310.15(B)(4)(a).

Panel Meeting Action: Reject

Panel Statement: Existing footnotes to Table 610.14(A) meet the concerns of the submitter.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-3 Log #74 NEC-P12 Final Action: Accept

(Table 610.14(D))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 12-6

Recommendation: The Technical Correlating Committee directs the panel to reconsider this proposal and clarify if their revisions are to the recommendation or the existing code text. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: Change the title of Table 610.14 (D) in the 2005 NEC to “Minimum Contact Conductor Size Based on Distance Between Supports”.

Add the word “Minimum” in front of the column title “Size of Wire (AWG)”

Panel Statement: The panel accepts the TCC direction and clarifies the meeting action to apply to the 2005 NEC text and not the text of Proposal 12-6.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-4 Log #1852 NEC-P12 Final Action: Accept in Principle

(610.31)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 12-9

Recommendation: Revise text to read as follows:

The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

Substantiation: The last sentence that was added by the panel “Portable means for adding a lock to the switch or circuit breaker shall not be permitted.” Will prohibit the use of portable devices that provide for the attachment of multiple locks (i.e. Scissors) to the locking mechanism. The sentence should be removed.

Panel Meeting Action: Accept in Principle

Revise the sentence that reads “Portable means for adding a lock to the switch or circuit breaker shall not be permitted.” of committee action on Proposal 12-9 to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.”

Submitter: Neil F. LaBrake, Jr., Syracuse, NY

Comment on Proposal No: 12-1

Recommendation: Revise the panel’s action on 610.61 as follows:

610.61 Grounding. All exposed non-current-carrying metal parts ofcranes, monorail hoists, hoists, and accessories, including pendant controls, shall be bonded to each other and to an equipment grounding conductor either by mechanical connections or bonding jumpers, where applicable so that the entire crane or hoist is a ground fault current path as required or permitted by Article 250, Parts V and VII.

Moving parts, other than removable accessories, or attachments that have metal-to-metal bearing surfaces, shall be considered to be electrically bonded to each other through bearing surfaces or through bonding jumpers or on the definition of the term “equipment grounding conductor” in Proposal 5-6. The change of the term “bonding conductor” to “bonding jumper” in the second paragraph in 610.61 is consistent with the NEC TCC Task Group on Grounding and Bonding’s original initiative that “bonding jumper” as defined in Article 100 is the proper use of the term.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Reject

Panel Statement: The original panel action in the ROP took into account the NEC TCC task group recommendation as presented in ROP Proposal 12-1 as it applied to cranes and hoists. While the intended results are the same, the changes proposed in the comment fail to regard some of the special physical constraints such as requiring the use of an impractically long jumper versus grounding conductor-collector systems required in some equipment systems.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-5 Log #1246 NEC-P12 Final Action: Reject

(610.61)
ARTICLE 620 — ELEVATORS, DUMBWAITERS, ESCALATORS, MOVING WALKS, WHEELCHAIR LIFTS, AND STAIRWAY CHAIR LIFTS

12-6 Log #2095 NEC-P12 Final Action: Reject
(620.11(A) Exception (New))

Submitter: Kevin L. Brinkman, AEMA, Dave Balmer
Comment on Proposal No: 12-23
Recommendation: The proposal has been reworded below to clarify the intent.
Please consider approval as modified.
620.11(A) Hoistway Door Interlock Wiring. The conductors to the hoistway door interlocks from the hoistway riser shall be flame retardant and suitable for a temperature of not less than 200°C (392°F). Conductors shall be Type SF or equivalent.

Exception: Where Firefighters’ Emergency Operation is not required, the conductors to hoistway door interlocks shall comply with 620.11(C).

Substantiation: The Panel Statement indicates that the purpose of this rule is to protect firefighters who are using the equipment during firefighters operations. The intent of this proposal was to defer to requirement 620.11(C) for equipment that does not have firefighters operation because it is not intended for use during fires (such as private residence elevators, platforms lifts, etc.).

Panel Meeting Action: Reject
Panel Statement: Whether the elevator is used by firefighters or not, protection should be provided to prevent the elevator from running with the doors open due to melted insulation on the hoistway door interlock wiring.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-7 Log #402 NEC-P12 Final Action: Reject
(Table 620.14)

Submitter: Daniel Leaf, Seneca, SC
Comment on Proposal No: 12-24
Recommendation: Accept in Part. Where Table 620.14 is used no other demand factors shall be permitted.
Substantiation: 220.61(B)(2) allows a demand factor for certain feeders that may supply elevator rooms. Proposal would clarify that both demand factors cannot be used.

Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any additional substantiation for the change.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-8 Log #1305 NEC-P12 Final Action: Reject
(620.15)

Submitter: David Sroka, Turner Falls, MA
Comment on Proposal No: 1-54
Recommendation: Add a sentence as follows:
“The short-circuit current rating shall be included on the nameplate for elevator controllers.”

Substantiation: This data is hard to obtain after the original installation. It is important information. The nameplate is the best place for the controller’s short-circuit current rating. Integral component’s rating can mistakenly be taken as the controller’s rating. Lastly, it is safest to read the nameplate to get this information rather than physical removal of covers, moving wires, etc. The function of an elevator controller is so critical that the rating merits inclusion on the nameplate.

Panel Meeting Action: Reject
Panel Statement: The FPN to 620.15 states, “For controller markings, see 430.8.” Section 430.8 requires the short-circuit current rating to be marked on the controller.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-9 Log #75 NEC-P12 Final Action: Accept
(620.21 Exception)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-25
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal regarding the exact location of the Exception.

The Technical Correlating Committee understands that the last phrase in the first sentence should read “the pump shall be permitted to be cord connected.” This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Following 620.21(A)(1)(d), add the following text:
(e) A sump pump or oil recovery pump located in the pit shall be permitted to be cord connected. The cord shall be a hard usage oil resistant type, of a length not to exceed 1.8 m (6 ft), and shall be located to be protected from physical damage.

Panel Statement: The panel accepts the direction of the TCC and has clarified the panel action and furthermore rewrites the exception into positive Code language.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-10 Log #2094 NEC-P12 Final Action: Reject
(620.21(A)(2)(d) Exception (New))

Submitter: Kevin L. Brinkman, AEMA, Dave Balmer
Comment on Proposal No: 12-30
Recommendation: The proposal has been reworded to reflect this change.
Please consider approval as modified:
620.21(A)(2)(d) Add Exception as follows:
Exception: Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted, in lengths not to exceed 3.6 m (12 ft) without being installed in a raceway and where the conduit is located to be protected from physical damage and is clamped every 1.8 m (6 ft) and where the conductors are of the flame retardant type.

Substantiation: In certain applications, such as wiring from a car top box to switches mounted on the car frame, it is very difficult to run hard conduit due to the close conditions and the need to “weave” in and around the car frame. Allowing longer lengths of flex conduit, while adding a requirement for clamping of the conduit every 6 ft, should provide equivalent safety to the current requirements.

Panel Meeting Action: Reject
Panel Statement: Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit are raceways and would not be installed in another raceway.

No technical substantiation has been provided for modifying the support distance required in 348.30, 350.30, and 356.30.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-11 Log #76 NEC-P12 Final Action: Accept
(620.21(A)(3)(e))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-31
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal since the proposal text is unclear as to how the final sentence is incorporated into the preceding text. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Revise the recommendation of Proposal 12-31 to read as follows:
(e) Flexible cords and cables in lengths not to exceed 1.8 m (6 ft) that are of a flame-retardant type and located to be protected from physical damage shall be permitted in these rooms and spaces without being installed in a raceway. They shall be part of:
(1) Listed equipment.
(2) A driving machine or
(3) A driving machine brake.

Panel Statement: The panel accepts the direction of the TCC and has clarified 620.21(A)(3)(e).

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-12 Log #551 NEC-P12 Final Action: Accept
(620.21(A)(4))

Comment on Proposal No: 12-33
Recommendation: Remove the (d) shown in the very beginning of the text in the original proposal. It was incorrectly included. The proposal should read as follows:

12-23 Log #76 NEC-P12 Final Action: Reject
(620.21(A)(4))
for a distance not exceeding 620.44 ft (6 ft) when they are properly supported and protected from physical damage and are of a flame-retardant type.

The following wiring methods shall be permitted on the counterweight assembly in lengths not to exceed 1.8 m (6 ft), without being installed in a raceway and where located to be protected from physical damage and are of flame-retardant type.

The following wiring methods shall be permitted on the counterweight assembly in lengths not to exceed 1.8 m (6 ft):

(a) flexible metal conduit
(b) liquidtight flexible metal conduit
(c) liquidtight flexible nonmetallic conduit

(d) flexible cords and cables, or conductors grouped together and taped or corded shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage and shall be of a flame-retardant type and shall be part of:

(1) listed equipment
(2) a driving machine, or
(3) a driving machine brake.

Substantiation: The Technical Correlating Committee was misled in their understanding as the original submittal was in error when it indicated 620.21(A)(4)(d) in the text of the revision. The subject of the revision is 620.21(A)(4).

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-13 Log #1718 NEC-P12 Final Action: Reject (620.37(D))

Panel Meeting Action: Reject
Panel Statement: The submitter has provided new substantiation for Proposal 12-47.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association
Comment on Proposal No: 12-47
Recommendation: Add new language to 620.27 as follows:

Note: Supporting material is available for review at NFPA Headquarters.

TCC Action: The Technical Correlating Committee understands that the panel action to accept the comment text replaces both existing paragraphs in 620.44.
Comment on Proposal No: 12-48
Recommendation: Recommend panel reconsider Proposals 12-48 and 12-49.
Proposed change:

620.44 Installation of Traveling Cables. Traveling cables that are suitably supported and protected from physical damage shall be permitted to be run without the use of a raceway in either or both of the following:

(a) when used inside the hoistway, on the elevator car, hoistway wall, counterweight, or controllers and machinery that are located inside the hoistway provided the cables are in the original sheath
(b) from inside the hoistway, to elevator controller enclosures and to elevator car and machine room, control room, machinery space, and control space connections, or a distance not exceeding 1.8 m (6 ft) in length as measured from the first point of support on the elevator car or hoistway wall, or counterweight where applicable, provided the conductors are grouped together and taped or corded, or in the original sheath.

These traveling cables shall be permitted to be continued to this equipment elevator controller enclosures and to elevator car and machine room, control room, machinery space, and control space connections, as fixed wiring, provided they are suitably supported and protected from physical damage.

Substantiation: NFPA 70 permits elevator travel cables that are properly supported to be used as fixed wiring in the hoistway without the use of junction boxes. There is no technical rationale to require these same cables that are located within the hoistway to be in raceways when lengths exceed 1.8 m (6 ft) when they are properly supported and protected from the risk of damage. Fully sheathed elevator travel cables are robust and designed to survive in an elevator hoistway for great lengths, as much as 250 meters, in unsupported conditions. Cables are designed for little strain on the copper conductors by use of a steel support member typically used as a center member in a round cable and as integral support members in flat construction and must meet the requirements of NFPA 70. Fully sheathed travel cables that are attached to cars, counterweights, and other hoistway machinery and suitably protected from physical damage have no more risk of damage than cables provided in raceways in these locations.

I have submitted examples with this comment on applications in accordance with the proposed change and note the travel cables are not exposed to any new hazards in the hoistway or on the car.

The supporting material are two examples that would permit application of elevator traveling cables in their original sheath in lengths greater than the current 6 ft limitation of NFPA 70, 620.44 in the hoistway and on the car. Elevator traveling cables are designed to be hung at great lengths within the hoistway, and when secured and protected from physical damage the use of raceways within the hoistway are not necessary.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-15 Log #77 NEC-P12 Final Action: Accept (620.51(A))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-51
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal since the sentence requiring the disconnecting means to be listed is in two different locations in the accepted text in Proposals 12-51 and 12-52. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action and statement on Comment 12-17.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-16 Log #78 NEC-P12 Final Action: Accept (620.51(A))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-52
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal since the sentence requiring the disconnecting means to be listed is in two different locations in the accepted text in Proposals 12-51 and 12-52. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action and statement on Comment 12-17.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-17 Log #55 NEC-P12 Final Action: Accept in Principle (620.51(A))

Comment on Proposal No: 12-51
Recommendation: Revise the text shown in the ROP under the Panel Action as follows:

The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted, other than means to add multiple locks such as a multiple lock hasp.

Substantiation: While Mr. White has a valid concern and comment, it should be made clear that portable means, other than those legitimately needed, are not to be permitted.

Panel Meeting Action: Accept in Principle
Revise the sentence that reads, “Portable means for adding a lock to the switch or circuit breaker shall not be permitted” of committee action on Proposal 12-51 to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be at and remain with the equipment.”
The text of the committee action on Proposal 12-51 as modified here is to be located before the sentence “The disconnecting means shall be a listed device.”

Panel Statement: See panel statement on Comment 12-4.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

Comment on Affirmative:
QUAVE, D.: See my Explanation of Affirmative Vote on Comment 12-4.

12-18 Log #1854 NEC-P12 Final Action: Accept in Principle (620.51(A))

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 12-51
Recommendation: Revise text to read as follows:

The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding to the switch or circuit breaker shall not be permitted.

Substantiation: The last sentence that was added by the panel “Portable means for adding a lock to the switch or circuit breaker shall not be permitted.” Will prohibit the use of portable devices that provide for the attachment of multiple locks (i.e. Scissors) to the locking mechanism. The sentence should be removed.

Panel Meeting Action: Accept in Principle
Revise the sentence that reads, “Portable means for adding a lock to the switch or circuit breaker shall not be permitted” of committee action on Proposal 12-51 to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.”

The text of the committee action on Proposal 12-51 as modified have is to be located before the sentence “The disconnecting means shall be a listed device.”

Panel Statement: See panel statement on Comment 12-4.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
QUAVE, D.: See my Explanation of Affirmative Vote on Comment 12-4.

12-20 Log #554 NEC-P12 Final Action: Accept in Principle (620.51(A) Exception)


Comment on Proposal No: 12-56
Recommendation: Revise the text shown in the ROP under the Panel Action as follows:

The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

Substantiation: Coordinate with same change made in Proposal 12-51.

Panel Meeting Action: Accept in Principle
Revise the sentence that reads, “Portable means for adding a lock to the switch or circuit breaker shall not be permitted” of committee action on Proposal 12-56 to read as follows:

“Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.”

Panel Statement: See panel statement on Comment 12-4.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
QUAVE, D.: See my Explanation of Affirmative Vote on Comment 12-4.

12-22 Log #1326 NEC-P12 Final Action: Accept in Principle (620.51(C)(1))

Submitter: Kevin S. Arnold, Bussmann

Comment on Proposal No: 12-58
Recommendation: Add this new text to the end of the proposed text: “The additional switch shall be a listed device.” proposed by the original proposal. This switch shall comply with 620.91(C) if connected on the line side of the elevator controller if additionally powered by an emergency or standby power system.

Substantiation: We feel that this additional text should be added for safety reasons. Adding an additional disconnect will increase the level of safety for this type of installation. The traditional shunt trip disconnect that is used to disconnect the elevator motor has an auxiliary contact that is mechanically connected to the disconnecting mechanism of the switch so it disconnects all power sources, both the normal power and the emergency or standby power which, for a hydraulic elevator, controls a solenoid to a piston drain valve. Adding a non-fused disconnect will negate this safety feature if it does not also disconnect both normal and emergency or standby power. Just disconnecting the non-fused switch for normal power will still leave the emergency or standby power operable, providing power to the solenoid and allowing the piston drain valve to open which allows the elevator to move and create a safety issue. Therefore, where an emergency or standby power source is connected to the controller, the new additional disconnect must be required to disconnect both the normal and emergency or standby power.

Overall, we feel this will provide for a safer system as long as all power to the elevator motor is disconnected by this requirement.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle
Revise the last sentence of the committee action on Proposal 12-58 to read as follows:

The additional switch shall be a listed device and shall comply with 620.91(C).

Panel Statement: The revised wording meets the intent of the submitter.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted, other than means to add multiple locks such as a multiple lock hasp.

**Panel Meeting Action: Accept in Principle**

Revise the sentence that reads, "Portable means for adding a lock to the switch or circuit breaker shall not be permitted" of committee action on Proposal 12-63 to read as follows:

"Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment."

**Panel Statement:** See panel statement on Comment 12-4.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

**Comment on Affirmative:**

QUAVE, D.: See my Explanation of Affirmative Vote on Comment 12-4.

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12-24 Log #556 NEC-P12 Final Action: Accept in Principle (620.54)

**Submitter:** Andy Juhasz, Kone, Inc. / Rep. National Elevator Industry Inc. (NEII)

**Comment on Proposal No:** 12-66

**Recommendation:** Revise the text shown in the ROP under the Panel Action as follows:

The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted, other than means to add multiple locks such as a multiple lock hasp.

**Substantiation:** Coordinate with same change made in Proposal 12-51.

**Panel Meeting Action: Accept in Principle**

Revise the sentence that reads, "Portable means for adding a lock to the switch or circuit breaker shall not be permitted" of committee action on Proposal 12-66 to read as follows:

"Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment."

**Panel Statement:** See panel statement on Comment 12-4.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

**Comment on Affirmative:**

QUAVE, D.: See my Explanation of Affirmative Vote on Comment 12-4.

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12-25 Log #1856 NEC-P12 Final Action: Accept in Principle (620.54)

**Submitter:** Michael Walls, American Chemistry Council

**Comment on Proposal No:** 12-66

**Recommendation:** Revise text to read as follows:

The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.

**Panel Meeting Action: Accept in Principle**

Revise the sentence that reads, "Portable means for adding a lock to the switch or circuit breaker shall not be permitted" of committee action on Proposal 12-66 to read as follows:

"Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment."

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12-28 Log #954 NEC-P12 Final Action: Accept (620.62)

**Submitter:** John Cool, PowerPlus Engineering Inc

**Comment on Proposal No:** 12-72

**Recommendation:** The Technical Panel should continue to reject this proposal.

**Substantiation:** Selective coordination is an important requirement for elevator circuits. Elevators are used for egress of building inhabitants during emergency situations and can be vital to firefighters for effective and rapid deployment. This requirement has been in several code cycles and there are several viable solutions to achieve selective coordination for elevator circuits. Our firm has done many jobs and easily meets the selective coordination requirements as well as other important life safety elevator system requirements. This requirement can be achieved with either fusible systems or circuit breaker systems.

**Panel Meeting Action: Accept**

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11
We are a consulting engineering firm that specializes in short-circuit and coordination requirements, minimize personnel hazards, and protect equipment. Ballot Results:

Affirmative: 11

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

We are a consulting engineering firm that specializes in short-circuit and coordination requirements, so we are intimately familiar with what it takes to selectively coordinate both fuses and circuit breakers. It does take sharp engineering skills to design both a selectively coordinated system and at the same time to minimize arc-flash energies and equipment short-circuit damage, but that is precisely what’s needed for critical circuits such as are found in elevator, emergency systems, and legally required standby systems. But, it can be and is achieved on a regular basis. Requiring total selectivity does not tie our hands when it comes to multiple emergency generators. We can design in transfer switches. We’ve heard of complaints about two devices in series of the same size not coordinating. Simply making the downstream disconnecting means a non-fused switch solves that problem. There is enough latitude in Article 450.3 for the overcurrent protective devices on the line side and load side of a transformer so that they will selectively coordinate. We also do not see any issues with violations of other NFPA Standards that call out for “optimized” selective coordination. To us, optimized means the very best that you can do, and total selectivity is certainly the very best that you can do. Finally, there are instances that there needs to be a requirement to selectively coordinate in the short-circuit range because short-circuits rarely happen. If that were the case, we don’t need Sections 110.9 and 110.10 in the NEC. Nor do we need the new requirements for marked short-circuit current ratings on industrial machinery or industrial control panels. Do you insure your home for just $5,000 because most claims are under that amount? Or, do you insure it for the full value, just in case it does burn to the ground or get blown away in a storm? Of course you insure it for the full value, even though a total loss may be an unusual event. Needless to say, we believe the Panel should continue to support the requirement for selective coordination in elevator circuits.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Ballot Results: Affirmative: 11

Submitter: Merrell Young, Herzog Engineering

12-30 Log #1401 NEC-P12 Final Action: Accept (620.62)

12-32 Log #2345 NEC-P12 Final Action: Reject (620.62)

Submitter: Peter R. Walsh, Peter R. Walsh, P.E. & Associates

Comment on Proposal No: 12-72

Recommendation: The Panel should continue to Reject this Proposal.

Substantiation: The NEC has required selective coordination for elevator circuits for years without major problems. The recent expansion of requirements makes good sense for the users of the buildings. Who wants to be stranded in an elevator or suffer from a blackout as a result of non-selective coordination? Engineers have software programs, like Easy Power Version 8.0 that can automate selective coordination.

With Zone Selective Coordination trips, almost anything can be coordinated. Arc flash can be adjusted by proper trips. The code making panel should require reliable power through selective coordination of important circuits.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Regulation: The Panel should continue to Reject this Proposal.

Substantiation: The NEC has required selective coordination for elevator circuits for years without major problems. The recent expansion of requirements makes good sense for the users of the buildings. Who wants to be stranded in an elevator or suffer from a blackout as a result of non-selective coordination? Engineers have software programs, like Easy Power Version 8.0 that can automate selective coordination.

With Zone Selective Coordination trips, almost anything can be coordinated. Arc flash can be adjusted by proper trips. The code making panel should require reliable power through selective coordination of important circuits.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 12-72

Recommendation: Accept the Proposal in Principle and revise the present text to read:

620.62 Selective Coordination. Where more than one driving machine disconnecting means is supplied by a single feeder, the overcurrent protective devices in each disconnecting means shall be selected to optimize selective coordination with only the immediate line side feeder device ahead of the machine disconnecting means.

Substantiation: It is clearly recognized in the NEMA comment that selective coordination can compromise reliability and safety if the engineering community is not provided appropriate latitude to ensure all performance aspects are addressed. If the panel is not willing to delete this section then it is prudent that the panel recognize this requirement can negatively impact safety and reliability and utilize similar language offered by Mr. Lottmann at NEMA to “optimize selective coordination.”
The present wording is often misunderstood across the industry. The wording in 700.27 has likely created this issue by requiring all supply side devices to the selective and 620 using the phrase “...any supply side... devices...” Recognizing the reason selectivity was put in place in 620 was to address the identification issue in a later cycle and did not remove selectivity. The confusion comes into play with the present wording of “...coordinated with any other supply side overcurrent protective device.”

Once again, if this is read to be applied back to the service, consider a campus style electrical system arrangement making it impossible to comply with the NEC. One can only conclude that if that is the intent of the panel that this section is not perceived as a safety issue and not being enforced. It also would not address all of the other branch circuits or feeders that are not selective or simply become overloaded and could trip a feeder on the system that supplies the feeder for the elevator. The intent as documented in the historical documents points only between the branch and immediate feeder devices and the challenge of finding the line side overcurrent device that tripped. A revision as provided above would clarify that “optimizing” selectivity on the branch and feeder would be required and remove most of the concerns that create a challenge for maximizing safety, reliability and performance.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree that the requirements for selective coordination reduce the level of reliability based on the substantiation provided. The rule exists to require a certain level of performance that provides the level of reliability needed for elevator circuits. Sufficient technical substantiation is not provided for removal of this requirement.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-34 Log #79 NEC-P12 Final Action: Accept (620.91, FPN)
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-74
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the appropriateness of the word “requirement”. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Revise the recommendation of Proposal 12-74 to remove the word “requirement.”
Panel Statement: The panel accepts the direction of the TCC and has removed the word “requirement” from the FPN.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-35 Log #80 NEC-P12 Final Action: Accept (620.91, FPN)
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-75
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the appropriateness of the word “requirement”. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action and statement on Comment 12-34.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

ARTICLE 625 — ELECTRIC VEHICLE CHARGING SYSTEM EQUIPMENT

12-36 Log #533 NEC-P12 Final Action: Reject (625.28)
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 12-80
Recommendation: Accept the proposal.
Substantiation: Requirement is superfluous. Hazardous (classified) areas are required to comply with Articles 500 through 516 by 90.3. There are, for example, no specific requirements for wet locations since it is unnecessary; 90.3 indicates Chapters 1 through 4 apply where such locations are covered.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position. No new substantiation was supplied with the comment.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-37 Log #81 NEC-P12 Final Action: Accept (626 (New))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-81
Recommendation: The Technical Correlating Committee advises that Article placement, titles and scope statements are the responsibility of the Technical Correlating Committee and, based on the current content of the Article, the Technical Correlating Committee directs that the Title and Scope be rewritten to read as follows: “Article 626 Electrified Truck Parking Spaces 626.1 Scope. The provisions of this article cover the electrical conductors and equipment external to the truck or transport refrigerated unit that connect trucks or transport refrigerated units to supply of electricity, and the installation of equipment and devices related to electrical installations within an electrified truck parking space.” This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action on Comment 12-44.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-38 Log #279 NEC-P12 Final Action: Reject (626 (New))
Submitter: Stanley J. Folz, Morse Electric, Inc.
Comment on Proposal No: 12-81
Recommendation: Delete entire new Article.
Substantiation: All of the information to wire an Electrified Parking Space is already contained in the NEC. Is it the intention of the NEC to provide Articles for every specialized application that exists?
Panel Meeting Action: Reject
Panel Statement: Although many of the actual requirements for an electrified truck parking space are found in Chapters 1 through 4 of the existing NEC Code, there are additional requirements and choices needed to provide a consistent and safe installation as described in the new Article 626, “Electrified Truck Parking Spaces”.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Negative: 1
Explanation of Negative: QUAVE, D.: The panel action should have been to accept. The submitter’s substantiation is correct.
Exception: A separable power supply cable assembly, rated 15A, provided for the connection of an engine block heater, a battery charger, an inverter system of 1000W or less, a fuel heater, an oil pan heater, and/or a fuel/water separator/heater only, shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 15 amperes, 125 volts, conforming to the configuration shown in Figure 626.30(c)(21)(d).

FPN: Complete details of the 15- or 20-ampere plug and receptacle configuration can be found in the National Electrical Manufacturers Association Standard for Dimensions of Attachment Plugs and Receptacles, ANSI/NEMA WD-6-2002, Figure 5-15 or 5-20.

Section 626.32.32 proposes specifications for on-board equipment vehicle specification standards are the purview of the Society of Automotive Engineers J2698 document. The following two sections of Section 626.32.32 indicated in strikethrough format should therefore be removed:

32.32 Truck/Vehicle Coupler.

(A) Inlet Rating and Configuration. Truck Inlet.

1) Each truck shall be provided with not more than two inlets corresponding to the type and rating of connector of the power supply cable truck parking space supply equipment to which it is intended to be connected. See 626.30(B) and 626.32.(C).

(D) Protection Against Corrosion and Mechanical Damage. Permanent provisions shall be made for the protection of the inlet and truck distribution panel, attachment plug of the power supply cord and any connector cord assembly or receptacle against corrosion and mechanical damage if such damage can result in an electrical hazard.

Section 626.34.34 proposes specifications for on-board equipment and should be removed. The condition of loss of power of the primary power source is accounted for in the Society of Automotive Engineers J2698 document. The following part indicated in strikethrough format should therefore be removed:

34.34 Loss of Primary Power Source. Means shall be provided such that, upon loss of voltage from the utility or other electric system(s), energy cannot be back fed through the truck and the truck supply equipment to the electrified truck parking space wiring system unless permitted by 626.34.33.

Section 626.34.33 makes opportunities to provide comments on this latest version of the proposed 2008 National Electrical Code, Article 626: Electrified Truck Parking Space Equipment [hereinafter Article 626]. TMA represents the following companies: Ford Motor Company, Freightliner LLC, General Motors Corporation, International Truck and Engine Corporation, Isuzu Commercial Truck of America, Inc., Kenworth Truck Company, Mack Trucks, Inc., Peterbilt Motors Company, Sterling Truck Company, Volvo Truck North America, Inc., and Western Star Trucks. Many of the recommendations we offered in our September 23, 2005, letter have been addressed in this latest version; we appreciate the NEC code article committee’s responsiveness in this regard. A few issues remain, however.

Paralleling the NEC effort, we can report that the corresponding SAE Task Force has balloted SAE J2698 - Primary Single Phase Nominal 120 VAC Wiring Distribution Assembly Design. This document, still in the progress, will provide for the on-board vehicle wiring assemblies to which parking space electrical connections can be made. It is critical to the successful implementation of truck stop electrification that the two documents provide a consistent and compatible interface between the vehicle and the electrified parking space.

The following compatibility issues remain crucial to enabling trucks to connect to off-board power:

1. TMA maintains our previous recommendation that a minimum of two 20-ampere, 120-volt AC connections are needed at electrified truck parking spaces. Depending on environmental conditions, the driver and vehicle may not utilize this full capacity, but this minimum availability is necessary for a viable electrified truck parking space system.

2. Trucks may be equipped with NEMA 5-15P or NEMA 5-20P plugs and/or vehicle shore power connectors for engine block heaters, battery chargers, inverter systems of 1000W or less, fuel heaters, fuel/water separator and heaters, and/or a fuel pan heaters; and with NEMA 5-20P plugs and/or vehicle shore power connectors for on-board 120VAC systems.

3. At this time, TMA members do not envision their customers needing a 30-ampere, 120/208 volt AC configuration on board the truck. While it is difficult to predict future power configurations, our members who are participating in the SAe J2698 standards development process are only able to identify need for 120-volt AC systems.

Panel Meeting Action: Reject

Panel Statement: The panel realizes that there are many on-board loads but on-board systems are beyond the scope of this article. The requirements for protection against corrosion and mechanical damage and loss of primary source are necessary and should not be deleted. See panel action and statement on Comment 12-44.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10
626.5 Other Articles.

(2) Connection to a 30-Ampere Receptacle.

(2) One 30-ampere, 120/208-volt, 3-pole, 4-wire receptacle

The Proposal should be Accepted in Principle, with the following specific modifications:

626.3 General Requirements.

A. Systems. This article covers 120, 120/208-, or 120/240-, 208Y/120-, 480-, or 480Y/277-volts, nominal, single- or three-phase, 3 or 4-wire power systems respectively, with reference to Figure 626.21(f) and Figure 626.21(g).

II. Electrically Parked Space Electrical Wiring. [insert after 626.4, before 626.5.]

626.5 Hazardous (Classified) Locations.

(A) Motor Fuel Dispensing Stations. Electrically parked space electrical wiring systems located at or serving motor fuel dispensing stations shall comply with Article 514 in addition to the requirements of this article.

(B) Vehicle Repair and Storage Facilities. Electrically parked space electrical wiring systems located at facilities for the repair or storage of self-propelled vehicles that use volatile flammable liquids or flammable gases for fuel or power shall comply with Article 511 in addition to the requirements of this article.

626.20(B) Type Receptacles Provided. [626.20(B) main paragraph and 626.20(B)(1) unchanged]

(2) One 30-ampere, 120/208-volt, 3-pole, 4-wire receptacle or one 30-ampere, 125/250-volt, 3-pole, 4-wire receptacle.

FPN: Complete details of the 30 ampere plug and receptacle configuration can be found in the Standard for Pin and Sleeve Configurations, UL1686.

626.20(D) Switch-Rated or Interlocked Receptacles. [delete 626.20(D) in its entirety]

626.21(G) Truck Coupler.

(2) Construction and Installation. The truck coupler shall be constructed in accordance with 626.21(F) and be installed so as to guard against inadvertent disconnect by persons with parts made live from the electrified parking space supply equipment or truck.

626.28(D) Switch Rated or Interlocked Receptacle. [delete 626.28(D) in its entirety]

626.11 Calculations. Table 626.10 Demand Factors for Services and Loaders, and USDA Agriculture Plant Hardiness Zone Map.

This proposal’s sole mandatory method to correlate Demand Factor to the USDA Agriculture Plant Hardiness Zone Map shall be a nonmandatory FPIn the otherwise acceptable alternative to allow the AHJ to select alternative methods to establish the applicable Demand Factor.

Reevaluate the percentage Demand Factors assigned to any given Zone based upon the year-round data, rather than solely upon January data, to ensure that these factors reflect the conditions of the Zone.

Situation exists for Article 626 and these proposed 30-ampere configurations other configurations and there were no established configurations prescriptively and indeed none are reflected. This same situation exists for Article 626 and these proposed 30-ampere configurations.

FPN: See Figures 626.21 for details regarding receptacle types.

626.21(D) Attachment Plug. [626.21(D) main paragraph and 626.21(D)(1) unchanged]

(2) Connection to a 30-Ampere Receptacle.

(a) rated 30 amperes, 120/208 volts and intended for use with the 30-ampere, 120/208-volt receptacle, conforming to the configuration shown in Figure 626.21(e) and intended for use with 120/208-volt switch-rated receptacle configuration conforming to the configuration shown in Figures 626.21(e) and 626.21(f).

(b) rated 30 amperes, 125/250 volts and intended for use with the 30-ampere, 125/250-volt receptacle, conforming to the configuration shown in Figure 626.21(e) and intended for use with 125/250-volt receptacle configuration conforming to the configuration shown in Figures 626.21(e) and 626.21(f).

FPN: Complete details of the 30 ampere plug and receptacle configuration can be found in the Standard for Pin and Sleeve Configurations, UL1686.

626.21(E) Connector. [626.21(E)(1) unchanged]

(2) The connector for a separable power supply cable assembly, as specified in 626.21(A)(2), shall be a 3-pole, 4-wire grounding type, either:

(a) rated 30 amperes, 120/208 volts, switch-inlet connector type, conforming to the configuration shown in Figure 626.21(e) and intended for use with 120/208-volt switch-inlet, conforming to the configuration shown in Figure 626.21(e) or

(b) rated 30 amperes, 125/250 volts, conforming to the configuration shown in Figure 626.21(e) and intended for use with 125/250-volt inlet configuration conforming to the configuration shown in Figures 626.21(e) and 626.21(f).

FPN: Complete details of the 30 ampere plug and receptacle configuration can be found in the Standard for Pin and Sleeve Configurations, UL1686.

626.21(G) Truck Coupler.

FPN: The connector in 626.21(E)(2)(b) may be used on a 120/208-volt, single-phase circuit.

626.21(D) Switch-Rated or Interlocked Receptacles. [delete 626.20(D) in its entirety, 626.21(A) Rating. [626.21(A) main paragraphs unchanged]

(1) Twenty-Ampere Power-Supply Assembly. Trucks wired with a 20-ampere, 125-volt truck inlet, in accordance with 626.21(H)(1), shall use a listed 20-ampere power-supply assembly.

Exception: [unchanged]

(2) Thirty-Ampere Power-Supply Assembly. Trucks wired with a 30-ampere, 120/208- or 125/250-volt truck inlet, in accordance with 626.21(H)(2), shall use a listed 30-ampere main-power-supply assembly having the same voltage rating.

626.21(H) Switch Rated or Truck Coupler. [delete 626.21(F) in its entirety]
Calculations, Table 626.10 Demand Factors for Services and Feeders, 626.21(A)(1), 626.21(A)(2): Incorrectly referenced to subparagraphs in connection to the equipment. Chapters 1 through 4 do not address the issue of energy into the grid creating an unsafe condition for electric utility workers. Improper installation of these power sources can result in the backfeed of common used to supply power to the truck when the engine is shut down. For example, aftermarket auxiliary power units (APU’s) and generators are commonly used to supply power to the truck while the engine is shut down.

The article is necessary because: (1) it contains requirements that are essential for safety and unique to this application, (2) it disallows unsafe options that would otherwise be permitted by the existing code, and (3) it defines the boundaries for electrical inspectors while establishing a safe infrastructure up to that boundary in anticipation of potentially unsafe conditions outside the jurisdiction of the code. Specifically, requirements unique to this application covered by Chap. 1 through 6 of the Code arc: (1) Demand factors based upon climatic temperatures at the site location. (2) Physical layout and configuration of equipment. The article excludes the "tuttle back or speed bump" design since such designs are easily damaged by snow removal equipment as well as water and flooding in truck parking sites. This article identifies the post, pedestal, overhead gantry, and raised concrete "turtle back or speed bump" design since such designs are easily damaged by snow removal equipment as well as water and flooding in truck parking sites.

5. In 626.4, revise the wording to read as follows:

"Cord Connector. A device which, by inserting it into a truck flanged inlet, establishes an electrical connection to the truck for the purpose of providing power for the on-board electric loads and may provide a means for information exchange. This device is part of the truck coupler."

4. In 626.4, revise the wording to read as follows:

"Cord. Extra-hard usage flexible cords and cables, rated not less than 600 volts, 3-phase, 3-pole, 4-wire and intended for use with 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively, or (2) 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire and intended for use with 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively.

Panel Meeting Action: Accept in Principle

5. In 626.10 Branch Circuit, revise the text to read as follows:

"Electrified truck parking space single-phase branch circuits shall be derived from a 208Y/120 volt, 3-phase, 4-wire system or a 120/208 volt, single-phase, 3-wire system.

6. Delete 626.20 as it is already covered by Article 250.

7. In the last sentence of 626.24(B), add “(B)(1) and (B)(2)” after the word “with.” Also, revise (B)(1) from “…on an individual…” to “…connected to an individual…”.

8. In 626.25(A)(1) and (A)(2), delete the word “wired”.

9. In 626.25(B)(1) revise the wording to read as follows:

"(2) Cord. Extra-hard usage flexible cords and cables, rated not less than 90°C (194°F), 600 volts; listed for both wet locations and sunlit resistance; and having an outer jacket rated to be resistant to temperature extremes, oil, gasoline, ozone, abrasion, acids, and chemicals shall be permitted where flexibility is necessary between the electrified truck parking space equipment, the panelboard, and flanged surface inlet(s) on the truck.”

This Proposal should have been Rejected. The panel action should have been to accept. The submitter’s substantiation is correct.

Panel Statement: See panel action on Comment 12-44, which means the intent of the submitter to include provisions for electrified truck parking spaces.

Ballot Results: Affirmative: 9 Negative: 1

TCC Action: The Technical Correlating Committee directs that the following actions be taken:

1. In 626(D) to be deleted because it is outside the scope of the NEC.

2. In 626(C), the last sentence is to be deleted as it is already covered in 110.26.

3. In 626.2, make the following revisions to the definition to read as follows:

"Cord Connector. A device which, by inserting it into a truck flanged surface inlet, establishes an electrical connection to the truck for the purpose of providing power for the on-board electric loads and may provide a means for information exchange. This device is part of the truck coupler."

4. In 626.4, revise the wording to read as follows:

"(2) Cord. Extra-hard usage flexible cords and cables, rated not less than 90°C (194°F), 600 volts; listed for both wet locations and sunlit resistance; and having an outer jacket rated to be resistant to temperature extremes, oil, gasoline, ozone, abrasion, acids, and chemicals shall be permitted where flexibility is necessary between the electrified truck parking space equipment, the panelboard, and flanged surface inlet(s) on the truck.”

11. In 626.30, replace the word “mentioned” with the word “required.”

12. In 626.25(B)(1), replace “all of Articles 626 and 626” with “all of Article 626.”

13. In 626.32(B), in the first sentence, add the word “equipment” before the words “grounding conductor”.

14. Revise 626.32(C)(1) and (2) to read: (1) 30-ampere, 480-volt, 3-phase, 3-pole, 4-wire and intended for use with 30-ampere 480-volt, 3-phase, 3-pole, 4-wire receptacles and inlets respectively, or (2) 60-ampere, 280-volt, 3-phase, 3-pole, 4-wire and intended for use with 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire receptacles and inlets.
respectively.

15. In 626.31(B), change “762 mm” to “750 mm”.
16. Delete 626.21 as it is already covered in Article 225.
17. Add “Electrified Truck Parking Space” and “Article 626” to Table 210.2 Specific-Purpose Branch Circuits.
18. Add “Electrified Truck Parking Space” and “Article 626” to Table 220.3 Additional Load Calculation References.

Submittor: Roger D. McDonough, GA

Comment on Proposal No: 12-81

Recommendation: Revise Article 626 as follows:

Revise as follows:

Article 626
Electrified Truck Parking Space Equipment

I. General

626.1 Scope. The provisions of this article cover the electrical conductors and equipment external to the truck or transport refrigerated unit that connect trucks or and transport refrigerated units to a supply of electricity, and the installation of equipment and devices related to electrified installations within an electrified truck parking space.

626.2 Definitions. (Revised. 1999 for additional definitions.)

A. Air Conditioning or Comfort Cooling Equipment. All of that equipment intended or installed for the purpose of treating the air so as to control simultaneously its temperature, humidity, cleanliness, distribution to meet the requirements of the conditioned space.

B. Appliance. Portable. An appliance that is actually moved or can easily be moved from one place to another in normal use.

C. Article, the following major appliances, other than built are considered portable if cord-connected, refrigerators, cook-tops, range, television, or other similar appliances.

FPN: For the purpose of this article, the following major appliances, other than built are considered portable if cord-connected, refrigerators, cook-tops, range, television, or other similar appliances.

D. Cable management system. An apparatus designed to control and organize unused lengths of cable or cord at electrified truck parking spaces.

E. Cord Connector. A device that, by insertion into a truck inlet, establishes an electrical connection to the truck for the purpose of providing power for the on-board electric loads and may provide a means for information exchange. This device is part of the truck coupler.

FPN: A truck coupler designed to control and organize unused lengths of cable or cord at electrified truck parking spaces.

F. Disconnecting Means, Parking Space. The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in an electrified truck parking space and intended to constitute the means of cutoff for the supply to that truck.

G. Electrified Truck Parking Space. A truck parking space that has been provided with an electrical system that allows truckers to “plug in” their vehicles while stopped, and use off-board power sources in order to operate on-board systems such as air conditioning, heating and appliances, without any engine idling.

FPN: An electrified truck parking space may also include dedicated parking areas for heavy duty trucks at travel plazas, warehouses, shipper and consignee, and other similar establishments, also known as parking facilities, that include areas such as the shoulders of on and off highway ramps and access roads, camping and recreational vehicle sites, residential and commercial parking areas used for automotive parking or other areas where ac power is provided solely for the purpose of connecting automotive and other electrical loads, such as engine block heaters, and at private residences.

H. Truck Stop. A plot of land upon which two or more truck parking sites are located, established, or maintained for occupancy by trucks for resting and other purposes.

(I) Truck Stop Electrification. An electrical system that allows truckers to “plug in” their vehicles while stopped, and use off-board power sources in order to operate on-board systems such as air conditioning, heating and appliances, without any engine idling.

J. Truck Stop Feeder Circuit Conductors. The conductors from the electrified truck parking space service equipment to the electrical parking space supply equipment.

626.3 Other Articles. Whenever the requirements of other articles of this code and Article 626 differ, the requirements of Article 626 shall apply.

626.4 General Requirement.

(A) Not Covered. The provisions of this article do not apply to that portion of other equipment in residential, commercial or industrial facilities that require electric power for devices used to load and unload cargo and equipment, operate conveyors, and other devices on the site or truck.

(B) Distribution System Voltages. Unless other voltages are specified, the nominal ac system voltage of 120, 120/240, 208Y/120, 240, or 480Y/277, and 480 volts shall be used to supply equipment covered by this article.

(C) Secondary Distribution Systems. This article applies to 208Y/120, 277Y/480, 480Y/277, or 120/240 volts nominal single or three-phase, 3 or 4 wire ac power supply systems, respectively, with ground. Where a different voltage is required by other design or available power supply system, adjustment shall be made in accordance with the provisions of this article.

(D) Connection to Wiring System. The provisions of this article shall apply to the electrified truck parking space supply equipment intended for connection to a wiring system as defined in 262.10(A)(1), or higher.

Exception: A 120-volt distribution system existing electrified truck parking space equipment shall be permitted to supply existing electrified truck parking spaces.

II. Truck Coupler. A mating truck inlet and connector set.

III. Electrified Truck Parking Space Electrical Wiring Systems.

626.10 Branch Circuits. Electrified truck parking space single phase branch circuits shall be derived from the 120/240, 208Y/120, 240, or 480Y/277, and 480 volt system. Each branch circuit shall be listed or labeled by a qualified testing agency and shall be connected in an approved manner when installed.

IV. Underground Service, Feeder, Branch Circuit, and Electrified Truck Parking Space Feeder Circuit Conductors.

(A) General. All direct burial conductors, including the equipment grounding
(A) Exposed Non-Current-Carrying Metal Parts. Exposed non-current carrying metal parts of fixed equipment, metal boxes, cabinets, and fittings that are not electrically connected to grounded equipment shall be grounded by a continuous equipment grounding conductor run with the circuit conductors from the service equipment or from the transformer of a secondary distribution system. Equipment grounding conductors shall be sized in accordance with 250.122 and shall be permitted to be employed for both the truck park and the transformer.

The arrangement of equipment grounding connections shall be such that the disconnection or removal of a receptacle or other device will not interfere with, or interrupt, the grounding continuity.

(B) Secondary Distribution System Grounding. Each secondary distribution system shall be grounded at the transformer secondary.

(C) Neutral Grounded Conductor Not to Be Used as an Equipment Grounding Conductor. The neutral grounded conductor shall not be used as an equipment grounding conductor for the truck park or the transformer secondary.

(D) Load-Side Grounding Connections. Bonding Connection to the Grounded Conductor on the Load Side. A bonding connection shall not be made to any grounded conductor on the load side of the service disconnecting means to a grounding electrode or to a metallic equipment-earthing conductor on the load side of the service disconnecting means except as covered in 250.30(A) for separately derived systems and 250.122(B) for separate buildings.

(E) Clearances for Overhead Conductors Clearance.

(1) Conductors Not Over 600 Volts. Open conductors or cables of not over 600 volts, nominal, shall have a vertical clearance of not less than 5.5 feet (1.7 m) measured from the surface of the parking lot and a horizontal clearance of not less than 600 mm (2 ft) in all areas subject to truck movement. In all other areas, clearances shall conform to 225.18 and 225.19.

(2) Conductors Over 600 Volts. Conductors over 600 volts, nominal, shall conform to 225.60 and 225.61.

(F) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(G) Overhead Gantry. Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(H) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(I) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(J) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(K) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(L) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(M) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(N) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(O) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(P) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(Q) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(R) Overhead Gantry or Cable Management System. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall be permitted to utilize means provided with the equipment or facilities described in 225.60 or 225.61. The power supply cable shall be permitted to be connected directly to the terminals of the panelboard or conductors within a junction box in the site supply equipment for disconnecting the power supply to a section of the truck stop. The facility disconnecting means shall be permitted to be installed in a readily reachable and accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.
(2) One single receptacle 3-pole, 4-wire grounding type, single phase rated either 30-ampere, 208Y/120-208 or 125/250-volts, 3-pole, 4-wire receptacle, conforming to the configurations shown in Figure 626.25(A)(2)(C). The 125/250-volt receptacle shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

FPN: For various configurations, see ANSI/UL 1686, configuration can be found in the Standard for Pin and Sleeve Configurations, UL 1686, Configurations Parts Figure C2.10 or Part C3.

(3) Cord. Extra-hard usage flexible cords and cables rated not less than 204-700 C (194°F) 600 volts; listed for both wet locations and sunlight resistance; and having an outer jacket that is resistant to temperature extremes, oil, gasoline, ozone, abrasion, acids, and chemicals shall be permitted where flexibility is necessary between the electrified truck parking space supply equipment and the panelboard and inlet(s) on the truck.

Exception: Costs for the separable power supply cable assembly for 15 and 20 A connections may be a hard-service type.

(4) Attachment Plug. The attachment plug(s) shall be listed, by itself or as part of a cord set, for the purpose and shall be molded to or installed on the flexible cord so that it is secured tightly to the cord at the point where the cord enters the attachment plug. If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from the cord. Where a flexible cord is provided, it shall be installed on or included in a cable management system that is listed as suitable for the purpose.

Exception: A separable listed three conductor separable power supply cable assembly, having one conductor identified by a continuous green color for use as the equipment grounding conductor, and rated 15 amperes, 125-volts may be provided for connection to an engine block heater for legacy vehicles.

208Y/120-volt circuit, see ANSI/NEMA WD 6-2002, Figure 5-15 or 5-20.

(b) Connection to a 30-Ampere Receptacle. A separable power supply cable assembly for connection to a truck having a 30-ampere inlet shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 20 amperes, 125 volts and intended for use with the 20-ampere, 125-volt receptacles, conforming to the configuration shown in Figure xxx.21(e).

Exception: Costs for the separable power supply cable assembly for 15 and 20 A connections may be a hard-service type.

(4) Attachment Plug. The attachment plug(s) shall be listed, by itself or as part of a cord set, for the purpose and shall be molded to or installed on the flexible cord so that it is secured tightly to the cord at the point where the cord enters the attachment plug. If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from the cord. Where a flexible cord is provided, it shall be installed on or included in a cable management system that is listed as suitable for the purpose.

Exception: A separable listed three conductor separable power supply cable assembly, having one conductor identified by a continuous green color for use as the equipment grounding conductor, and rated 15 amperes, 125-volts may be provided for connection to an engine block heater for legacy vehicles.

FPN: For nonlocking- and grounding-type Complete details of the 15- or 20-ampere plug and receptacle configurations, see can be found in the National Electrical Manufacturers Association Standard for Dimensions of Attachment Plugs and Receptacles, ANSI/NEMA WD 6-2002, Figure 5-15 or 5-20.

(b) Connection to a 30-Ampere Receptacle. A separable power supply cable assembly for connection to a truck having a 30-ampere inlet shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 30 amperes, 208Y/120-volts or 125/250-volts, and intended for use with the receptacle in accordance with 626.24(B)(2). The 125/250-volt attachment plug shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

208Y/120-volt circuit, see ANSI/NEMA WD 6-2002, Figure 5-15 or 5-20.

(b) Connection to a 30-Ampere Receptacle. A separable power supply cable assembly for connection to a truck having a 30-ampere inlet shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 30 amperes, 208Y/120-volts or 125/250-volts, and intended for use with the receptacle in accordance with 626.24(B)(2). The 125/250-volt attachment plug shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

208Y/120-volt circuit, see ANSI/NEMA WD 6-2002, Figure 5-15 or 5-20.

(b) Connection to a 30-Ampere Receptacle. A separable power supply cable assembly for connection to a truck having a 30-ampere inlet shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 30 amperes, 208Y/120-volts or 125/250-volts, and intended for use with the receptacle in accordance with 626.24(B)(2). The 125/250-volt attachment plug shall be permitted to be used on a 208Y/120-volt, single-phase circuit.
parking spaces with electrical supply intended to supply Transport Refrigerated Units shall each include a dedicated equipped with additional circuit and receptacle as grid power capacity to provide for operation of the heating/refrigeration units. The receptacle associated with the electrified truck parking space supply equipment shall be rated for 208-volt 3-phase short circuit fault currents of at least 35 kA. The switch rated receptacle-plug combination, including a grounded receptacle with an associated switching device of an interlocking type, or provided with an equivalent means to prevent connection or disconnection under load. The switch-rated receptacle-plug combination, the interlocked plug and receptacle combination, or other means provided shall ensure that no live parts are exposed to contact.

(D) Reserved

626.42 626.32 Power Supply Cable Assembly. Where a power supply cable assembly, consisting of a cord with an attachment plug and cord connector, shall be provided, it shall be wired directly to the panelboard or other source of supply. The attachment plug and cord assembly shall be OEM (factory) supplied or OEM or factory approved, and be of one of the following types and rating specified herein. Cords with adapters and pigtail ends, extension cords, and similar items shall not be used.

(A) Rating. The power supply cable assembly shall be listed and rated:
   (1) 30 ampere, 480-volt, three-phase plug and receptacle, or
   (2) 60 ampere, 208-volt, three-phase plug and receptacle.

626.42 Power Supply Cable Assembly Conductors.

(A) Listed Cord Assemblies. The cord shall be a listed type with four conductors, for three-phase plug connection, one of which shall be identified by a continuous green color for use as the grounding conductor. Cord: Extra-hard usage cables rated not less than 20°C (194°F) 90°C, 600 volts; listed for both wet locations and sunlight resistance; and having an outer jacket rated to be resistant to temperature extremes, oil, gasoline, ozone, chlorinated hydrocarbons, and weather. The switch rated receptacle-plug combination, the interlocked plug and receptacle combination, or other means provided shall ensure that no live parts are exposed to contact.

(B) Listed Attachment Plug(s) and Cord Connector(s). Where a flexible cord with an attachment plug and cord connector, they shall comply with 250.138(A), and 250.138(B). An attachment plug and cord connector for the connection of a truck or trailer shall be either:
   (1) rated 30 ampere, 480-volt, three-phase plug and intended for use with a 480-volt, three-phase plug and receptacle, or
   (2) rated 60 ampere, 208-volt, three-phase plug and intended for use with the 60-ampere, 208-volt, three-phase plug and receptacle and intended for use with 208-volt, three-phase receptacle.
The TCC directive was followed concerning the scope and title. Figures 626.12(B)(1) and (2) were deleted per NFPA request because the unused lengths of cable or cord at electrified truck parking spaces.

**626.2 Definitions**

Equipment and devices related to electrical installations within an electrified truck parking space.

**626.23(e)** The maximum height of a connection plug and receptacle, and cord connector should be no more than 6 ft 7 in. high. This restriction is also mandatory language in 626.23 to prevent the maximum height of a connection plug and receptacle, and cord connector configurations for refrigerated containers (transport refrigerated units) to be beyond reach of 6 ft 7 in. height.

**626.25(B)(4)(a) Receptacle, Connector, Attachment Plug, and Inlet Configurations** was removed from this article. The device(s) on the truck into which the truck or TRU flanged surface inlet is considered to be part of the truck and not part of the transport refrigeration unit distribution system against corrosion and mechanical damage if such devices are in an exterior location while the truck or trailer is in transit.

**Substantiation:** The Code Making Panel 12 Chair, Tim Croushore formed a task group of Panel 12 members to develop a comment for proposed Article 626 “Electrified Truck Parking Spaces.” The task group members are Roger McDaniel (chairman), William Anderson, Jeff Holmes, Ron Janikowski, Robert Jones, Todd Lottman, and Craig Sato.

The TCC directive was followed concerning the scope and title. The TCC directive was followed regarding the rewrite of the proposed article for clarity, compliance with the NEC style Manual, and consistency of terminology. Several additions or deletions reflect relocation for clarity.

The article was rewritten to remove any requirements that are not within the scope of NFPA 70 (i.e., onboard truck or transport refrigerated units (TRU) equipment).

The article was rewritten to remove any requirements that are addressed in other parts of the code. A FPN was added to further detail what an electrified truck parking space consists of and possible locations.

The definitions included in this article were modified to exclude definitions appearing in Article 100 or that related to onboard equipment outside the scope of this article.

Figures 626.12(B)(1) and (2) were deleted per NFPA request because the NEC is not printed in color and the colored map would be confusing to the user. The idea of including a website reference to the map was dismissed because of NFPA requirements as well. More detailed data was retrieved and included in the fine print note following Table 626.12(B) from the HTTP://www.usana.usda.gov/hardzone/ushzmap.html web site which includes the following statement. “Note: This publication is not copyrighted, and permission to reproduce all or any part of it is not required.”

The mounting height datum in 626.22(B) was revised for consistency with terminology in Section 682.23(3). Permissive language was changed to mandatory language in 626.23 to prevent the maximum height of a connection from being beyond reach of 6 ft 7 in. height.

Section 626.32 was revised to refer to portable cable assemblies that are provided as a part of the means to connect the power supply equipment to the truck/trailer.

**626.3 Other Articles.** Wherever the requirements of other articles of this Code and Article 626 differ, the requirements of Article 626 shall apply. Unless electrified truck parking space wiring systems are supported or arranged in such a manner that they cannot be used in or above locations classified in 511.3 or 514.3 or both, they shall comply with 626.3(A) and 626.3(B) in addition to the requirements of this article.

(A) Vehicle Repair and Storage Facilities. Electrified truck parking space wiring systems located at facilities for the repair or storage of self-propelled vehicles that use volatile flammable liquids or flammable cases for fuel or power shall comply with Article 511.

(B) Motor Fuel Dispensing Stations. Electrified truck parking space wiring systems located at or serving motor fuel dispensing stations shall comply with Article 514.

Report on Comments A2007 — Copyright, NFPA 70

626.4 General Requirements.

(A) Not Covered. The provisions of this article do not apply to that portion of other equipment in residential, commercial or industrial facilities that require electric power for devices used to load and unload cargo and equipment, operate conveyors, and other devices on the site or truck.

(B) Distribution System Voltages. Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, or 480Y/277, shall be used to supply equipment covered by this article.

(C) Connection to Wiring System. The provisions of this article shall apply to the electrified truck parking space supply equipment intended for connection to a wiring system as defined in 626.10(A).

(D) Illumination. Illumination shall be provided to facilitate safe use of electrified truck parking spaces.

II. Electrified Truck Parking Space Electrical Wiring Systems

626.10 Branch Circuits. Electrified truck parking space single-phase branch circuits shall be derived from a 208Y/120 volt 3-phase system or a 120/240 volt single-phase system.

Exception: A 120-volt distribution system shall be permitted to supply existing electrified truck parking spaces.

626.11 Feeder and Service Load Calculations.

(A) Parking Space Load. The calculated load of a feeder or service shall not be less than the sum of the loads on the branch circuits. Electrical service and feeders shall be calculated on the basis of not less than 11 kVA per electrified truck parking space.

(B) Demand Factors. Electrified truck parking space electrical wiring system demand factors shall be based upon the climatic temperature zone in which the equipment is installed. The demand factors set forth in Table 626.11(B) shall be the minimum allowable demand factors that shall be permitted in calculating the load for service and feeders. No demand factor shall be allowed for any other load, except as provided in this Article.

Table 626.11(B) Demand Factors for Services and Feeders

<table>
<thead>
<tr>
<th>Climatic Temperature Zone (USDA Hardiness Zone)</th>
<th>Demand Factor (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70%</td>
</tr>
<tr>
<td>2a</td>
<td>67%</td>
</tr>
<tr>
<td>2b</td>
<td>62%</td>
</tr>
<tr>
<td>3a</td>
<td>59%</td>
</tr>
<tr>
<td>3b</td>
<td>57%</td>
</tr>
<tr>
<td>4a</td>
<td>55%</td>
</tr>
<tr>
<td>4b</td>
<td>51%</td>
</tr>
<tr>
<td>5a</td>
<td>47%</td>
</tr>
<tr>
<td>5b</td>
<td>43%</td>
</tr>
<tr>
<td>6a</td>
<td>39%</td>
</tr>
<tr>
<td>6b</td>
<td>34%</td>
</tr>
<tr>
<td>7a</td>
<td>29%</td>
</tr>
<tr>
<td>7b</td>
<td>24%</td>
</tr>
<tr>
<td>8a</td>
<td>21%</td>
</tr>
<tr>
<td>8b</td>
<td>20%</td>
</tr>
<tr>
<td>9a</td>
<td>20%</td>
</tr>
<tr>
<td>9b</td>
<td>20%</td>
</tr>
<tr>
<td>10a</td>
<td>21%</td>
</tr>
<tr>
<td>10b</td>
<td>23%</td>
</tr>
<tr>
<td>11</td>
<td>24%</td>
</tr>
</tbody>
</table>

Note: The climatic temperature zones shown in Table 626.11(B) correlate with those found on the “USDA Plant Hardiness Zone Map,” and the climatic temperature zone selected for use with the table shall be determined through the use of this map based on the installation location.

FPN: The US Department of Agriculture (USDA) has developed a commonly used “Plant Hardiness Zone” map that is publicly available. The map provides guidance for determining the Climatic Temperature Zone. Data indicates that the HVAC has the highest power requirement in cold climates, with the heating demand representing the greatest load, which in turn is dependent on outside temperature. In very warm climates, where no heating load is necessary, the cooling load increases as the outdoor temperature rises.

(C) Two or More Electrified Truck Parking Spaces. Where the electrified truck parking space wiring system is in a location that serves two or more electrified truck parking spaces, the equipment for each space shall comply with 626.11(A) and the calculated load shall be computed on the basis of each parking space.

(D) Conductor Rating. Truck space branch circuit conductors shall have an ampacity not less than the loads supplied.

III. Electrified Truck Parking Space Supply Equipment

626.20 Grounding

(A) Exposed Non-Current-Carrying Metal Parts.

(1) Fixed Equipment. Exposed non-current-carrying metal parts of fixed equipment, metal enclosures, and fittings that are not electrically connected to grounded equipment shall be bonded by a continuous equipment grounding conductor run with the circuit conductors from the service equipment or from the transformer of a secondary distribution system.

(B) Distribution System Grounding. Each distribution system shall be grounded at the transformer secondary in accordance with 250.30(A).

(C) Load-Side Grounding Connections. A grounding connection shall not be made to any grounded conductor on the load side of the service disconnecting means except in accordance with 250.30(A) for separately derived systems.

626.21 Overhead Clearances.

(A) Conductors Not Over 600 Volts. Conductors or cables of not over 600 volts, nominal, shall conform to 225.18 and 225.19.

(B) Conductors Over 600 Volts. Conductors and cables over 600 volts, nominal, shall conform to 225.60 and 225.61.

626.22 Wiring Methods and Materials.

(A) Electrified Truck Parking Space Supply Equipment Type. The electrified truck parking space supply equipment shall be provided in one of the following forms:

(1) Post or Pedestal

(2) Overhead Gantry

(3) Raised Concrete Pad

(B) Mounting Height. Post, pedestal, and raised concrete pad types of electrified truck parking space supply equipment shall be not less than 600 mm (2 ft.) above ground or above the point identified as the prevailing highest water level mark or an equivalent benchmark based on seasonal or storm-driven flooding from the authority having jurisdiction.

(C) Access and Working Space. All electrified truck parking space supply equipment shall be accessible by an unobstructed entrance or passageway not less than 600 mm (2 ft.) wide and not more than 2.0 m (6 ft. 6 in.) high. Sufficient space shall be provided and maintained about all electrical equipment to permit ready and safe operation, in accordance with 110.26.

(D) Disconnecting Means. A disconnecting switch or circuit breaker shall be provided to disconnect one or more electrified truck parking space supply...
equipment sites from a remote location. The disconnection means shall be provided and installed in a readily accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.

626.23 Overhead Gantry or Cable Management System. (A) Cable Management. Electrified truck parking space equipment provided from either overhead gantry or cable management systems shall utilize a permanently attached power supply cable in electrified truck parking space supply equipment. Other cable types and assemblies listed as being suitable for the purpose, including optional hybrid communications, signal, and optical fiber cables, shall be permitted. (B) Strain Relief. Means to prevent strain from being transmitted to the wiring terminals shall be provided. Permanently attached power supply cable(s) shall be provided with a means to de-energize the cable conductors and power service delivery device upon exposure to strain that could result in either cable damage or separation from the power service delivery device and exposure of live parts.

626.24 Electrified Truck Parking Space Supply Equipment Connection Means. (A) General. Each truck shall be supplied from electrified truck parking space supply equipment through suitable extra hard service cables or cords. Each connection to the equipment shall be by a single separable power supply cable assembly. (B) Receptacle. All receptacles shall be listed and of the grounding type. Every truck parking space with electrical supply shall be equipped with: (1) Two single receptacles, each shall be 2-pole 3-wire grounding type, rated 20 amperes, 125 volts, and shall be on an individual branch circuit, and (2) One single receptacle 3-pole, 4-wire grounding type, single phase rated either 30-ampere 208Y/120-volts or 125/250-volts. The 125/250-volt receptacle shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

FPN: For various configurations of 30-ampere pin and sleeve receptacles, see ANSI/UL1686, Standard for Pin and Sleeve Configurations, Figure C2.9 or Part C3.

Exception: Where electrified truck parking space supply equipment provides the air-conditioning and comfort cooling function without requiring a direct electrical connection at the truck, only the two receptacles identified in 626.24(B)(1) shall be required.

(C) Disconnecting Means, Parking Space. The electrified truck parking space supply equipment shall be provided with a switch or circuit breaker for disconnecting the power supply to the electric truck parking space. A disconnecting means shall be provided and installed in a readily accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed and remain with the equipment.

(D) Ground-Fault Circuit-Interrupter Protection for Personnel. The electrified truck parking space equipment shall be designed and constructed such that all receptacle outlets in 626.24 are provided with ground-fault circuit-interrupter protection for personnel.

626.25 Separable Power-Supply Cable Assembly. A separable power-supply cable assembly, consisting of a power supply cord, a cord connector, an attachment plug and intended for connection with a truck flanged surface inlet, shall be of a listed type. The power-supply cable assembly or assemblies shall be identified and be of one of the following types and ratings specified herein. Cords with adapters and pigtail ends, extension cords, and similar items shall not be used.

(A) Rating(s).

(1) Twenty-Ampere Power-Supply Cable Assembly. Equipment wired with a 20-ampere, 125-volt receptacle, in accordance with 626.24(B)(1), shall use a listed 20-ampere power-supply cable assembly.

Exception: It shall be permitted to use a listed separable power supply cable assembly, either hard-service or extra hard service and rated 15 amperes, 125 volts for connection to an engine block heater for existing vehicles.

(2) Thirty-Ampere Power-Supply Cable Assembly. Equipment wired with a 30-ampere, 208Y/120-volt or 125/250-volt receptacle, in accordance with 626.24(B)(2) shall use a listed 30-ampere main power-supply cable assembly.

(B) Power Supply Cord.

(1) Conductors. The cord shall be a listed type with three or four conductors, for single phase connection, one of which shall be identified in accordance with 400.23.

Exception: It shall be permitted to use a separate listed three conductor separable power supply cable assembly, having one of which shall be identified in accordance with 400.23, and rated 15 amperes, 125-volts for connection to an engine block heater for existing vehicles.

(2) Cord. Extra-hard usage flexible cords and cables rated not less than 90°C (194°F), 600 volts; listed for both wet locations and sunlight resistance; and having an outer jacket rated to be resistant to temperature extremes, oil, gasoline, ozone, abrasion, acids, and chemicals shall be permitted where flexibility is necessary between the electrified truck parking space supply equipment and the panel board and flanged surface inlet(s) on the truck.

Exception: Cords for the separable power supply cable assembly for 15 and 20 ampere connections shall be permitted to be a hard-service type.

(3) Cord Overall Length. The exposed cord length shall be measured from the face of the attachment plug to the point of entrance to the truck or the face of the flanged surface inlet or to the point where the cord enters the truck. The overall length of the cable shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is listed as suitable for the purpose.

(4) Attachment Plug. The attachment plug(s) shall be listed, by itself or as part of a cord set, for the purpose and shall be molded to or installed on the flexible cord so that it is secured tightly to the cord at the point where the cord enters the attachment plug. If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from the cord. Where a flexible cord is provided, the attachment plug shall comply with 250.138(A).

(a) Connection to a 20-Ampere Receptacle. A separable power supply cable assembly for connection to a truck flanged surface inlet, rated at 20 amperes, shall have a nonlocking-type attachment plug that shall be 2-pole, 3-wire, grounding type, rated 20 amperes, 125 volts and intended for use with the 20-ampere, 125-volt receptacle.

Exception: A separable power supply cable assembly, rated 15 amperes, provided for the connection of an engine block heater, only, shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 15 amperes, 125 volts.

FPN: For nonlocking- and grounding-type 15- or 20-ampere plug and receptacle configurations, see National Electrical Manufacturers Association Standard for Dimensions of Attachment Plugs and Receptacles, ANSI/NEMA WD6-2002, Figure 5-15 or 5-20.
(b) Connection to a 30-Ampere Receptacle. A separable power supply cable assembly for connection to a truck flanged surface inlet, rated at 30 amperes, shall have an attachment plug that shall be 3-pole, 4-wire, grounding type, rated 30-amperes, 208Y/120-volts or 125/250-volts, and intended for use with the receptacle in accordance with 626.24(B)(2). The 125/250-volt attachment plug shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

FPN: For various configurations of 30-ampere pin and sleeve plugs, see ANSI/UL1686, Standard for Pin and Sleeve Configurations, Figure C2.10 or Part C3.

(5) Cord Connector. The cord connector for a separable power supply cable assembly, as specified in 626.25(A) (1), shall be a 2-pole, 3-wire grounding type, rated 20 amperes, 125 volts. The cord connector for a separable power supply cable assembly, as specified in 626.25(A)(2), shall be a 3-pole, 4-wire grounding type, rated 30-amperes, 208Y/120-volts or 125/250-volts. The 125/250-volt cord connector shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

Exception: The cord connector for a separable power supply cable assembly, rated 15 amperes, provided for the connection of an engine block heater for existing vehicles, shall have an attachment plug that shall be 2-pole, 3-wire, grounding type, rated 15 amperes, 125 volts.

FPN: For various configurations of 30-ampere cord connectors, see ANSI/UL1686 Standard for Pin and Sleeve Configurations, Figure C2.9 or Part C3.

626.26 Loss of Primary Power. Means shall be provided such that, upon loss of voltage from the utility or other electric supply system(s), energy cannot be back-fed through the truck and the truck supply equipment to the electrified truck parking space wiring system unless permitted by 626.27.

626.27 Interactive Systems. Electrified truck parking space supply equipment and other parts of a system, either on-board or off-board the vehicle, that are identified for and intended to be interconnected to a vehicle and also serve as an optional standby system or an electric power production source or provide for bi-directional power feed shall be listed as suitable for that purpose. When used as an optional standby system, the requirements of Article 702 shall apply, and when used as an electric power production source, the requirements of Article 705 shall apply.

IV. Transport Refrigerated Units (TRU)

626.30 Transport Refrigerated Units. Electrified truck parking spaces intended to supply Transport Refrigerated Units shall include an individual branch circuit and receptacle for operation of the refrigeration/heating units. The receptacle associated with the Transport Refrigerated Units shall be provided in addition to the receptacles mentioned in 626.24(B).

(A) Branch Circuits. TRU spaces shall be supplied from 208 volt-3 phase or 480-volt-3-phase branch circuits and with an equipment grounding conductor in accordance with 250.118

(B) Electrified Truck Parking Space Supply Equipment. The electrified truck parking space supply equipment, or portion thereof, providing electrical power for the operation of TRU's shall be independent of the loads in Part III.

626.31 Disconnecting Means and Receptacles.

(A) Disconnecting Means. Disconnecting means shall be provided to isolate each refrigerated unit from its supply connection. A disconnecting means shall be provided and installed in a readily accessible location and shall be capable of being locked in the open position. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.

(B) Location. The disconnecting means shall be readily accessible, located not more than 762 mm (30 in.) from the receptacle it controls, and shall be located in the supply circuit ahead of the receptacle. Circuit breakers or switches located in power outlets complying with this section shall be permitted as the disconnecting means.

(C) Receptacles. All receptacles shall be listed and of the grounding type. Every electrified truck parking space intended to provide an electrical supply for transport refrigerated units shall be equipped with one or both of the following:

1. a 30 ampere, 480-volt, 3-phase, 3 pole, 4 wire receptacle,
2. a 60 ampere, 208-volt, 3-phase, 3 pole, 4 wire receptacle

FPN: Complete details of the 30-ampere pin and sleeve receptacle configuration for refrigerated containers (transport refrigerated units) can be found in ANSI/UL1686 Standard for Pin and Sleeve Configurations, Figure C2.11. For various configurations of 60-ampere pin and sleeve receptacles, see ANSI/UL1686 Standard for Pin and Sleeve Configurations.

626.32 Separable Power Supply Cable Assembly. A separable power supply cable assembly, consisting of a cord with an attachment plug and cord connector, shall be of one of the following types and rating specified below. Cords with adapters and pigtail ends, extension cords, and similar items shall not be used.

(A) Rating(s). The power supply cable assembly shall be listed and rated:

1. 30 ampere, 480-volt, 3-phase, or
2. 60 ampere, 208-volt, 3-phase

(B) Cord Assemblies. The cord shall be a listed type with four conductors, for 3-phase connection, one of which shall be identified in accordance with 400.23 for use as the grounding conductor. Extra-hard usage cables rated not less than 90°C (194°F), 600 volts, listed for both wet locations and sunlight resistance; and having an outer jacket rated to be resistant to temperature extremes, oil, gasoline, ozone, abrasion, acids, and chemicals, shall be permitted where flexibility is necessary between the electrified truck parking space supply equipment and the inlet(s) on the TRU.

(C) Attachment Plug(s) and Cord Connector(s). Where a flexible cord is provided with an attachment plug and cord connector, they shall comply with 250.138(A). The attachment plug(s) and cord connector(s) shall be listed, by itself or as part of the power supply cable assembly, for the purpose and shall be molded to or installed on the flexible cord so that it is secured tightly to the cord at the point where the cord enters the attachment plug or cord connector.

If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from the cord. An attachment plug and cord connector for the connection of a truck or trailer shall be either:

1. Rated 30 ampere, 480-volt, 3-phase, 3 pole, 4 wire and intended for use with a 30 ampere 480-volt, 3-phase, 3 pole 4 wire receptacles and inlets respectively,
2. Rated 60 ampere, 208-volt, 3-phase, 3 pole, 4 wire and intended for use with a 60-ampere, 208-volt, 3-phase, 3 pole, 4 wire receptacles and inlets respectively

FPN: Complete details of the 30-ampere pin and sleeve attachment plug and cord connector configurations for refrigerated containers (transport refrigerated units) can be found in ANSI/UL1686, Standard for Pin and Sleeve Configurations, Figures C2.12 and C2.11. For various configurations of 60-ampere pin and sleeve attachment plugs and cord connectors, see ANSI/UL1686, Standard for Pin and Sleeve Configurations.

Panel Statement: The work on Article 626 was a result of a balanced task group assigned by the chairman of CMP-12 to address the issue of electrified truck parking spaces. This article reflects input from representatives of all facets of the electrical industry. The task group also used expertise from other representatives of the parking space industry and technology. CMP-12 recommends the that the TCC consider the following for correlation with the addition of this new article:
2. Add “Electrified Truck Parking Space” and “Article 626” to Table 220.3

Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel rejects the original wording. It does not provide clarity in accordance with the NEC Style Manual.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-46 Log #2307 NEC-P12 Final Action: Accept in Principle (626.3)

Submitter: Brian Rock, Hubbell Incorporated
Comment on Proposal No: 12-81
Recommendation: Revise text to read as follows:
626.3 Other Articles. Wherever the requirements of articles of this Code and Article 626 differ, the requirements of Article 626 shall apply. Unless electrified truck parking space wiring systems are supported or arranged in such a manner that they cannot be used in or above locations classified in 511.3 or 514.3 or both, they shall comply with 626.3(A) and 626.3(B) in addition to the requirements of this article.
(A) Vehicle Repair and Storage Facilities. Electrified parking space electrical wiring systems located at facilities for the repair or storage of self-propelled vehicles that use volatile flammable liquids or flammable gases for fuel or power shall comply with Article 511.
(B) Motor Fuel Dispensing Stations. Electrified parking space electrical wiring systems located at or serving motor fuel dispensing stations shall comply with Article 514.

Revise text to read as follows: FPN: For additional information, see NFPA 88A—2002, Standard for Parking Structures, and NFPA 30A—2003, Code for Fuel Dispensing Facilities and Repair Garages.

Substantiation: Requirements of Article 626 as proposed are intended solely for ordinary locations. Electrified truck parking spaces, however, may be located adjacent to Special Occupancies for fuel dispensing and for vehicle repair and storage; these occupancies are frequently hazardous (classified) locations. As re-titled, Article 626 might be misconstrued as being a Special Occupancy rather than Special Equipment. Consequently, unforeseen 626.3 could be misconstrued to mean that specific requirements of Article 626 might also be sufficient for hazardous (classified) locations as well and that Article 626 incorrectly takes precedence over requirements of Articles 511 and 514 in those classified areas. Arcing devices such as switchgear, switches, plugs, outlets, etc., shouldn’t be used in hazardous (classified) locations, unless evaluated and Listed as suitable for such locations. Furthermore, Articles 511 and 514 have requirements for wiring and equipment installed above, as well as in, Class I locations. Revision in accordance with this Comment removes that ambiguity. 626.3(A) and 626.3(B) for electrical systems serving trucks are similar to established requirements 555.22 and 555.21, respectively, for electrical systems serving boats.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 12-44, which meets the intent of the submitter.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-47 Log #1735 NEC-P12 Final Action: Reject (626.10 and 626.12)

Submitter: Adam McCall, IdleAire Technologies Corporation
Comment on Proposal No: 12-81
Recommendation: Retain the original text.
Substantiation: In the substantiation provided with the original proposal, it was indicated that additional data from various truckstops, where electrified parking space equipment has been installed, would continue to be collected and be available for further review.

The additional data continues to show the Electrified Truck Parking Spaces (ETPS) will not be able to provide sufficient heating and cooling capacity if only two single-phase, 120Vac/20A circuits were provided to a parked truck. This can be clearly seen through the data I have submitted. The compilation of over 1 million hours of service has proven that the current proposed article is correct in suggesting that the required capacity to be delivered to a parked truck will require the 30A 208Vac circuit.

We believe there are two commercially-supported means for justifying this statement - by use of the existing ETPS field data and by reviewing the design capacity for some of the most popular on-board auxiliary power units. The existing ETPS field data continues to show the average demand varying with the outdoor air temperature, as listed in the Demand Load graph provided in the original substantiation. This graph provided a design basis for the average total site load given the most probable occupancy of an ETPS user and the duty cycles present during the various ambient conditions.

It should be noted that the peak HVAC load present is greater than these averages and thus should be considered when evaluating the requirements for input power loads. The field data shows that in almost all weather conditions, a parked truck could require loads that exceed the available power capacity of a single-phase 20A/120Vac (2400W) branch circuit.

Furthermore, the market today for on-board systems, referred to herein as auxiliary power units (APUs), also suggests that the design requirements have moved well beyond the 2400W range. A quick look at five of the most commonly used APUs shows that the average cooling capacity for APU air conditioning units is 17,200 Btu/hr, which corresponds to 42A @ 120Vac. This value far exceeds the single 120Vac/20A circuit rating and can only be provided by way of the proposed single-phase 30A 208Vac circuit.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: The panel rejects the original wording. It does not provide clarity in accordance with the NEC Style Manual.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-48 Log #2344 NEC-P12 Final Action: Accept in Principle in Part (626.20.B)

Submitter: Jeff Kim, Sharepower, LLC
Comment on Proposal No: 12-81
Recommendation: Revise text to read as follows:
12. Motor Fuel Receptacles. Provided. All receptacles shall be of the grounding type.

A maximum of three receptacles shall be provided. Every truck parking space with electrical supply shall be equipped with:
(1) Two 20-ampere, 125-volt single receptacles, NEMA type 5-20R, and FPN: Complete details of the 20-ampere plug and receptacle configuration can be found in the Standard for Pin and Sleeve Configurations, UL 1686, Configuration section, Part 2, Class 1.2.

Substantiation: If power for TRUs is to be supplied there may be 4 or more receptacles for each truck parking space.

All currently available trucks with shore power connections use the 120-volt, type 5-20R or 5-15R receptacles. There is currently no reason to require a 120-208-volt connection. This requirement will only increase the overall cost of the infrastructure and could slow growth or this industry. It should be up to technology provider to decide if the third receptacle is necessary and will meet the needs of their customers. The higher amp connection may also encourage higher energy consumption. Future load requirements could be reduced with the use of energy management systems and insulation of the cab envelope.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel accepts in principle the removal of the maximum number of receptacles. See panel action on Comment 12-44 which meets the intent of the submitter.

The panel does not accept the recommendation for the removal of the 30-ampere receptacle. The substantiation does not allow for future 30-ampere configurations.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
12-49 Log #2350 NEC-P12 | Final Action: Accept in Principle (626.20.D)

Submitter: Jeff Kim, Sharepower, LLC

Comment on Proposal No: 12-81

Recommendation: Revise text to read as follows:

D. Switch-Rated or Interlocked Receptacles. Each receptacle provided by the electrified parking space supply equipment shall be either a switch-rated receptacle- plug combination, include an interlocked receptacle with an associated switching device of an interlocking type, or provided with an equivalent means to prevent connection or disconnection under load. The switching device shall be rated to close into and withstand short circuit fault currents of at least 35 kA.

The switch rated receptacle-plug combination, the interlocked plug and receptacle combination, or other means provided shall ensure that the user has no access to live parts.

Exception: NEMA type 5-20R and 5-15R...

Panel Meeting Action: Accept in Principle

Panel Statement: The panel has removed the requirement for interlocking on any types of receptacles. See panel action on Comment 12-44. However, the panel does not agree with the submitter’s substantiation that the limitation for interlocking be limited to NEMA Type 5-20R and 5-15R configuration receptacles. These configurations can be interlockable.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Negative: 1

Report on Comments A2007 — Copyright, NFPA

12-50 Log #2556 NEC-P12 | Final Action: Accept in Principle (626.28)

Submitter: Brian Rock, Hubbell Incorporated

Comment on Proposal No: 12-81

Recommendation: [Section numbering in this Comment replaces “626.28(B)” from the ROP Panel Meeting Action with “626.24(B)” to be used in the CP12 Public Comment renumbering developed by the CP12 Ad Hoc Task Group on new Article 626. Figure 626.30(C) is numbered in accordance with the ROP Panel Meeting Action and may possibly be shown as Figure 626.25(B)(4)(a) in the CP12 Public Comment renumbering developed by the CP12 Ad Hoc Task Group on new Article 626.]

Delete Figure 626.30(C) for Receptacle, Connector, Attachment Plug and Inlet Configurations.

626.28 626.24 Means for Connecting to Electrified Truck Parking Space Supply Equipment.

(B) Types of Receptors Provided - NEMA Configurations. All receptacles shall be of the grounding type. A maximum of three receptacles shall be provided: Every truck parking space with electric supply shall be provided with:

1. Two 20-ampere, 125-volt, single receptacles, each shall be 2-pole, 3-wire ground receptacle, as shown in Figure 626.30(C) view (a) and (b) and configurations shown in Figure 5-20, NEMA Type 5-20R, and

FPN: For complete details of the 15- or nonlocking- and grounding-type 20-ampere plug and receptacle configuration, see can be found in the National Electrical Manufacturers Association Standard for Dimensions of Attachment Plugs and Receptacles, ANSI/NEMA WD6-2002, Figure 5-20.

2. One single receptacle, 3-pole, 4-wire ground receptacle, single-phase rated either 30 amperes, 208Y/120 volts or 125/250 volts, 30 ampere, 120/208 volt, 3-pole, 4-wire single receptacle conforming to the configuration in Figure 626.30(C) view (b) or (c). The 125/250-volt receptacle shall be permitted to be used on a 208Y/120-volt single-phase circuit.

FPN 1: For various configurations complete details of the 30-ampere plug pin and sleeve receptacle configuration, see can be found in the ANSI/UL1686, Standard for Pin and Sleeve Configurations; UL1686; Parts Figure 626.30(C) view 2(b) or Part C3.

FPN 2: For Transport Refrigerated Units (TRU), see Part IV. 2.

Substantiation: Mandatory specification of a proprietary, patented, closed-license receptacle and plug configuration violates “GUIDELINE ON REFERENCES IN NFPA DOCUMENTS TO PROPRIETARY PRODUCTS AND SERVICES” in the NFPA Committee Officers Guide.

The configuration for the 20-ampere receptacle is a de facto standard via the widespread usage of the compatible NEMA 5-15 inlet for truck engine block heaters. The specific configuration for that 20-ampere receptacle is documented dimensionally in the Standard for Dimensions of Attachment Plugs and Receptacles, ANSI/NEMA WD6. The FPN directs the reader to the application-specific reference for this dedicated configuration.

Presently, there is no installed base of 30-ampere receptacles for truck applications. No accepted standards organization representing users has adopted the depicted configurations. NFPA should not be put in the position of having the sole standards-setting body determining which eligible receptor and plug configurations should be permitted or excluded.

Furthermore, UL has indicated that the depicted configuration for the switch-rated 208Y/120-volt device is not among those in ANSI/UL1686 and will only be considered under “new business” upon issuance of the Third Edition after publication of the 2008 NEC®. UL also indicates there is no certainty any “new business” proposal will be adopted into the new edition.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 12-44, which meets the intent of the submitter.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-51 Log #2259 NEC-P12 | Final Action: Accept in Principle (626.28(D))

Submitter: Michael Beanland, Vancouver, WA

Comment on Proposal No: 12-81

Recommendation: Add (3) One 30-ampere 125/250-volt 3-pole, 4-wire, grounding receptacle conforming to the configuration shown in Figure 626.30.

Substantiation: Section 626.30(A)(4)(b) includes the use of a 30-ampere 125/250-volt plug, however, 626.28(D)(2) does not allow installation of the receptacle.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 12-44, which meets the intent of the submitter.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-52 Log #2261 NEC-P12 | Final Action: Accept in Principle (626.28(D))

Submitter: Michael Beanland, Vancouver, WA

Comment on Proposal No: 12-81

Recommendation: Receptacles Provided - NEMA Configurations. All receptacles shall be of the grounding type. A maximum of three receptacles shall be provided: Every truck parking space with electric supply shall be provided with:

...
Trucks wired with a 30-ampere 120/208-volt supply cable assembly and should be included in this article.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 12-44, which meets the intent of the submitter.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

Submitter: Michael Beanland, Vancouver, WA

Comment on Proposal No: 12-81
Recommendation: Revise text to read as follows:

"Trucks wired with a 30-ampere 120/208-volt supply cable assembly and should be included in this article.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 12-44, which meets the intent of the submitter.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

Submitter: Brian Rock, Hubbell Incorporated

Comment on Proposal No: 12-81
Recommendation: [Section numbering in this Comment replaces “626.42” and “626.32” from the ROP Panel Meeting Action with “626.32” and “626.31” to be used in the CP12 Public Comment renumbering developed by the CP12 Ad Hoc Task Group on new Article 626.]

Revise wording to comply with TCC directive and add FPN to 626.31(C).
NOTE: 626.32(C) wording differs from that developed by the CP12 Ad Hoc Task Group.

626.42 626.32 Power Supply Cable Assembly, Where: A power supply cable assembly, consisting of a cord with an attachment plug and a cord connector, is provided, it shall be wired directly to the panelboard by an approved wiring method. The attachment plug shall be of a listed type. The power supply cable assembly or assemblies shall be OEM (factory) supplied or OEM or factory approved and be one of the following types and rating specified herein. Cords with adapters and pigtail ends, extension cords, and similar items shall not be attached to, provided or shipped with a truck used.

[626.32(A) and 626.32(B)]

(B) Listed Attachment Plug(s) and Cord Connector(s), Where: A flexible cord is provided with an equipment grounding conductor and equipped with an attachment plug and a cord connector, the attachment plug shall comply with 250.138(A) and 250.138(B). An attachment plug and cord connector for connection of a truck or trailer shall be one of:

(1) rated 30-ampere, 480-volt, three phase, 3-phase 3-phase receptacles and inlets, respectively, or

(2) rated 60-ampere, 208-volt, three phase, 3-phase 3-phase receptacles and inlets, respectively. FPN: Complete details of the 30-ampere pin and sleeve attachment plug and cord connector configurations for refrigerated containers (transport refrigerated units) can be found in ANSI/UL 1686, Standard for Pin and Sleeve Configurations, Figures C2.12 and C2.11. For various configurations of 60-ampere pin and sleeve attachment plug and cord connectors, see ANSI/UL 1686, Standard for Pin and Sleeve Configurations.

The attachment plug(s) and cord connector(s) shall be listed, by itself themselves or as part of the power supply cable assembly, for the purpose and shall be molded to or installed on the flexible cord so that it is they are secured tightly to the cord at the point where the cord enters the attachment plug or cord connector. If a right-angle cap attachment plug or cord connector is used, the configuration shall be oriented so that the grounding member contact is farthest from the cord.

Substantiation: Per TCC action, the Article is to cover the electrical equipment external to the truck or transport refrigerated unit. Consequently, the cord connector must be defined since the power supply cable assembly must be a cord set consisting of an attachment plug, flexible cable and cord connector rather than a power supply cord consisting of an attachment plug and terminated free end of cable.

[626.40(E)]

(1) Disconnector Means and Branch-Circuit Protective Equipment

(E) (D) NEMA Configuration Receptacle Requirements Type Receptacle(s) and Cord Connector(s) Provided. All receptacles shall be of the grounding type. All 30-ampere, 480-volt, three phase, 3-phase 3-phase receptacles. FPN: Complete details of the 30-ampere pin and sleeve receptacle configuration for refrigerated containers (transport refrigerated units) can be found in ANSI/UL 1686, Standard for Pin and Sleeve Configurations, Figure C2.11. For various configurations of 60-ampere pin and sleeve receptacles, see ANSI/UL 1686, Standard for Pin and Sleeve Configurations.

Substantiation: The configuration for the 30-ampere receptacles, attachment plugs, cord connectors and inlets is already American- and internationally-standardized specific to the refrigerated container (transport refrigerated unit) application. These receptacles, attachment plugs, cord connectors and inlets are not bladed NEMA configurations (ANSI/NEMA WD6), so the indication of “NEMA Configuration” should be deleted. The specific configuration for that 30-ampere receptacle is documented dimensionally in the ANSI/UL Standard for Pin and Sleeve Configurations, ANSI/UL 1686, in Figure C2.11 for outlet devices (receptacles and cord connectors). The FPN directs the reader to the application-specific reference for this dedicated configuration.

Presently, there is no standardized refrigerated container usage at either 60 amperes or at 208 volts. Consequently, for this application, there is no standardized configuration for receptacles, attachment plugs, cord connectors and inlets. The FPN for the 60-ampere configuration is purely an informative reference, without prejudice or endorsement, to a number of potentially eligible pin and sleeve configuration schemes that could serve the purpose.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 12-44, which meets the intent of the submitter.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
2) The task group also agreed to recommend the addition of a new Fine Print

The Task Group came to consensus on the following issues and submitted

Ballot Results:

Number Eligible to Vote: 12
Panel Meeting Action: Accept

sometimes require disassembly of part of the building. This is not the intent

wiring methods.”

accessible cable, the panel refers to the definition of Accessible as it applies to

owner wants to take a ceiling down to access and remove abandoned cables,

wiring systems or components. This expectation is unrealistic. If the building

abandoned cable never damage the building finish or compromise adjacent

Proposal 12-87 in one of a series of proposals submitted to panels 3, 12 and

Panel 3 rejected proposals 3-147 and 3-218 with the statement:

“This proposed change would make it a requirement that removal of

abandoned cable never damage the building finish or compromise adjacent

wiring systems or components. This expectation is unrealistic. If the building

owner wants to take a ceiling down to access and remove abandoned cables,

the NEC should not and cannot restrict this action. In regard to the removal of

accessible cable, the panel refers to the definition of Accessible as it applies to

wiring methods.”

Panel 16 rejected proposals 16-28, 16-72, 16-176, 16-190, 16-258, 16-323
and 16-364 with the statement:

“The proposed requirement presents a compliance conundrum to installers.

Without access, it is impossible to remove cables that are securely fastened
without damaging the building or adjacent cables. Gaining access may
sometimes require disassembly of part of the building. This is not the intent
of the panel. The current requirement to remove only the accessible portion is
reasonable.”

Panel Meeting Action: Accept

Ballot Results: Affirmative: 12

12-60 Log #1611 NEC-P12 Final Action: Accept (640.3)

Submitter: Allen C. Weidman, Society of the Plastics Industry, Inc.
Comment on Proposal No: 12-87
Recommendation: Reject this proposal.
Substantiation: The Society of the Plastics Industry supports the removal
of abandoned cables. One of our member companies is in the business of
removing abandoned cables from buildings. Section 300.11 (Securing and Supporting) requires that “Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place.” It is not possible to remove all abandoned cables if the installation complies with 300.11 and the cables are installed behind a wall.

Proposal 12-87 in one of a series of proposals submitted to panels 3, 12 and

Panel 3 rejected proposals 3-147 and 3-218 with the statement:

“This proposed change would make it a requirement that removal of

abandoned cable never damage the building finish or compromise adjacent

wiring systems or components. This expectation is unrealistic. If the building

owner wants to take a ceiling down to access and remove abandoned cables,

the NEC should not and cannot restrict this action. In regard to the removal of

accessible cable, the panel refers to the definition of Accessible as it applies to

wiring methods.”

Panel 16 rejected proposals 16-28, 16-72, 16-176, 16-190, 16-258, 16-323
and 16-364 with the statement:

“The proposed requirement presents a compliance conundrum to installers.

Without access, it is impossible to remove cables that are securely fastened
without damaging the building or adjacent cables. Gaining access may
sometimes require disassembly of part of the building. This is not the intent
of the panel. The current requirement to remove only the accessible portion is
reasonable.”

Panel Meeting Action: Accept

Ballot Results: Affirmative: 12

12-61 Log #240 NEC-P12 Final Action: Accept in Principle (640.3(A) and 640.6(C))

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 12-101
Recommendation: Accept this proposal in principle by modifying 640.6(C) as shown.
(C) Abandoned Audio Distribution Cables. The accessible portion of
abandoned abandoned audio distribution cables shall be removed.
Substantiation: The panel action on proposal 12-101 was to accept in
principle with a reference to the action on proposal 12-94. Proposal 12-101
recommended moving the requirement to remove abandoned cables to a more
appropriate section. The panel action on proposal 12-94 accomplished that
objective. However, the panel action on 12-94 also changed the requirement
from the removal of only the accessible portion of the cables to requiring the
removal of all the cables, including those stapled to studs behind a sheetrock
wall.

See proposal 16-27; panel 16 in its rejection statement stated:

“The proposal would require all abandoned cable to be removed, irrespective
of accessibility, presenting a compliance conundrum to installers. Without
access, it is impossible to remove all cables that are securely fastened
without damaging the building or adjacent cables. The submitter’s substantiation states:

“It is not reasonable or necessary to install cables in a manner that prevents
their eventual removal.” However, the panel previously imposed additional
securing and supporting requirements by referencing 300.11 in 800.24. Gaining
access may sometimes require disassembly of part of the building. This is not
the intent of the panel. The current requirement to remove only the accessible
portion is reasonable. The submitter further proposes to add an FPN following
800.3(C) that is already contained in 800.24.”

Panel Meeting Action: Accept in Principle
Panel Statement: Refer to the panel action and statement on Comment 12-61.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:

12-62 Log #1433 NEC-P12 Final Action: Accept in Principle (640.3(A) and 640.6(C))

Comment on Proposal No: 12-94
Recommendation: Modify the panel action on 640.6(C) as shown.
(C) Abandoned Audio Distribution Cables. The accessible portion of
abandoned abandoned audio distribution cables shall be removed.

12-59 Log #1432 NEC-P12 Final Action: Accept (640.3)

Comment on Proposal No: 12-87
Recommendation: Reject this proposal.
Substantiation: The Society of the Plastics Industry supports the removal
of abandoned cables. One of our member companies is in the business of
removing abandoned cables from buildings. Section 300.11 (Securing and Supporting) requires that “Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place.” It is not possible to remove all abandoned cables if the installation complies with 300.11 and the cables are installed behind a wall.

Proposal 12-87 in one of a series of proposals submitted to panels 3, 12 and

Panel 3 rejected proposals 3-147 and 3-218 with the statement:

“This proposed change would make it a requirement that removal of

abandoned cable never damage the building finish or compromise adjacent

wiring systems or components. This expectation is unrealistic. If the building

owner wants to take a ceiling down to access and remove abandoned cables,

the NEC should not and cannot restrict this action. In regard to the removal of

accessible cable, the panel refers to the definition of Accessible as it applies to

wiring methods.”

Panel 16 rejected proposals 16-28, 16-72, 16-176, 16-190, 16-258, 16-323
and 16-364 with the statement:

“The proposed requirement presents a compliance conundrum to installers.

Without access, it is impossible to remove cables that are securely fastened
without damaging the building or adjacent cables. Gaining access may
sometimes require disassembly of part of the building. This is not the intent
of the panel. The current requirement to remove only the accessible portion is
reasonable.”

Panel Meeting Action: Accept

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

12-58 Log #544 NEC-P12 Final Action: Accept (640.3)

Submitter: Richard P. Owen, City Of St. Paul
Comment on Proposal No: 12-87
Recommendation: Reject this proposal.
Substantiation: This comment was written by a Task Group consisting of
Stan Kauffman and Randy Ivans (Panel 16), John Mortimer (Panel 12) and Ron
Maessen, Paul Casparro (Panel 3) plus Task Group Chair Richard Owen (Panel
3). The Task Group was directed by the Technical Correlating Committee to
examine proposals submitted to all three Panels concerning abandoned cable
and other related issues covered by the Panels.

The Task Group came to consensus on the following issues and submitted
comments to the Panels as appropriate:

1) On the issue of abandoned cable removal, the task group agreed that
only the accessible portions of abandoned cable should be removed. To
require removal of all cable could, in some cases, necessitate demolition of
the building finish in order to access cables that were properly fastened to the
building in accordance with the rules in the various code articles. Furthermore,
the task group agreed that the requirements for abandoned cable removal
should not be in Section X.3 (Locations and Other Articles) but should be
relocated into the general requirements of each article.

2) The task group also agreed to recommend the addition of a new Fine Print
Note to further explain the removal requirement. This addition was thought to
be necessary to address a common practice of cables that are “fished” inside
existing walls. These cables, if abandoned, can be disconnected from their
junction point in a wall and pulled out of the wall without having to harm the
building finish. At present, in many cases, these cables are being cut off above
the wall and left to drop into the wall space.

3) On the issue of “tagged for future use”, the Task Group agreed that it
was not necessary to require anything more than the cable tag being “...of
sufficient durability to withstand the environment involved.” This phrase is
used in several other places in the NEC and leaves it up to the AHJ as to what is
suitable. This language does not add requirements that are difficult, if not
impossible, to enforce by adding unclear requirements for rodent-resistance,
etc.

Panel Meeting Action: Accept

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Substantiation:
The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

The current requirement for the removal of abandoned cable is in 640.3 Locations and Other Articles. It requires the removal of only the accessible portion of audio distribution cables.

“(A) Spread of Fire or Products of Combustion. The accessible portion of abandoned audio distribution cables shall be removed. See 300.21.”

Proposals 12-101 and 12-102 recommended moving the requirement to remove abandoned cables to a more appropriate section. The panel action on proposal 12-94 accomplished that objective.

However, the panel action on 12-94 also changed the requirement from the removal of only the accessible portion of the cables to requiring the removal of all the cables, including those that are inaccessible.

Section 640.9(A)(3) Other Wiring requires compliance with Article 725. Article 725 permits the substitution of Article 800 cables. Both Articles 725 and 800 require the removal of only the accessible portion of abandoned cables.

Continued acceptance of the text in 640.6(C) will produce a conflict in the code. Acceptance of this comment will remove the conflict.

Panel Meeting Action: Accept in Principle
Panel Statement: Refer to the panel action and statement on Comment 12-67.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:

Final Action: Accept in Principle (640.6)

Submitter: John H. Mortimer, Inductotherm Industries, Inc.
Comment on Proposal No: 12-94
Recommendation: Revise text to read as follows:

“640.6(D)(1) Cables identified for future use shall be marked with a tag in accordance with the following:
(a) Tag is impervious to the effects of temperature and dampness.
(b) Tag is resistant to the effects of gnawing by rodents in a database.

Section 640.9(A)(3) Other Wiring requires compliance with Article 725. Article 725 permits the substitution of Article 800 cables. Both Articles 725 and 800 require the removal of only the accessible portion of abandoned cables.

Continued acceptance of the text in 640.6(C) will produce a conflict in the code. Acceptance of this comment will remove the conflict.

Panel Meeting Action: Accept in Principle
Panel Statement: Refer to the panel action and statement on Comment 12-67.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:

Final Action: Accept in Principle (640.6)

Submitter: Timothy P. McNeive, Thomas & Betts Corporation
Comment on Proposal No: 12-92
Recommendation: Change the panel action to Accept in Principle. Add the additional text suggest in the comment on affirmative vote by Mr. Lottmann: “Cable ties that provide primary support for such cables shall have a minimum loop tensile strength of 23 kg (50 lbs).”

Substantiation: “Minimum loop tensile” strength is commonly marked on packages of cable ties. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The panel is also asked to follow the long time position of CMP-7 and not consider in its final decision the requirement that cable ties or other support hardware to be listed.

Panel Meeting Action: Reject
Panel Statement: The cable tie strength or failure has not been illustrated as a problem. The submitter has not provided definitive technical substantiation for the inclusion of minimum loop tensile strength to the requirement.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Final Action: Reject (640.6)

Submitter: Jeff Holmes, Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-94
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action and statement on Comment 12-67.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Final Action: Accept (640.6)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-94
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC. See panel action and statement on Comment 12-67.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Final Action: Accept (640.6)

Submitter: Timothy P. McNeive, Thomas & Betts Corporation
Comment on Proposal No: 12-92
Recommendation: Change the panel action to Accept in Principle. Add the additional text suggest in the comment on affirmative vote by Mr. Lottmann: “Cable ties that provide primary support for such cables shall have a minimum loop tensile strength of 23 kg (50 lbs).”

Substantiation: “Minimum loop tensile” strength is commonly marked on packages of cable ties. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The panel is also asked to follow the long time position of CMP-7 and not consider in its final decision the requirement that cable ties or other support hardware to be listed.

Panel Meeting Action: Reject
Panel Statement: The cable tie strength or failure has not been illustrated as a problem. The submitter has not provided definitive technical substantiation for the inclusion of minimum loop tensile strength to the requirement.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Final Action: Reject (640.6)

Submitter: Richard P. Owen, City Of St. Paul
Comment on Proposal No: 12-94
Recommendation: Revise text to read as follows:

640.6 (C) Abandoned Audio Distribution Cables:

(a) Tag is impervious to the effects of temperature and dampness.
(b) Tag is resistant to the effects of gnawing by rodents in a database.

Section 640.9(A)(3) Other Wiring requires compliance with Article 725. Article 725 permits the substitution of Article 800 cables. Both Articles 725 and 800 require the removal of only the accessible portion of abandoned cables.

Continued acceptance of the text in 640.6(C) will produce a conflict in the code. Acceptance of this comment will remove the conflict.

Panel Meeting Action: Accept in Principle
Panel Statement: Refer to the panel action and statement on Comment 12-67.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:

Final Action: Accept in Principle (640.6)
Substantiation: This comment was written by a Task Group consisting of Stan Kaufman and Randy Evans (Panel 16), John Mortimer (Panel 12) and Ron Maassen, Paul Casparro (Panel 3) plus Task Group Chair Richard Owen (Panel 3). The Task Group was directed by the Technical Correlating Committee to examine cable proposals submitted to all three Panels concerning abandoned cable and other related issues covered by the Panels.

The Task Group came to consensus on the following issues and submitted comments to the Panels as appropriate:

1) On the issue of abandoned cable removal, the task group agreed that only the accessible portion of abandoned cable should be removed. To require removal of all cable could, in some cases, necessitate demolition of the building finish in order to access cables that were properly fastened to the building in accordance with the rules in the various code articles. Furthermore, the task group agreed that the requirements for abandoned cable removal should not be included in Section X.3 (Locations and Other Articles) but should be relocated into the general requirements of each article.

2) The task group also agreed to recommend the addition of a new Fine Print Note to further explain the removal requirement. This addition was thought to be necessary to address a common practice of cables that are “fished” inside existing walls. These cables, if abandoned, can be disconnected from their junction point in a wall and pulled out of the wall without having to harm the building finish. At present, in many cases, these cables are being cut off above the wall and left to drop into the wall space.

3) On the issue of “tagged for future use,” the Task Group agreed that it was not necessary to require anything more than the cable tag being “…of sufficient durability to withstand the environment involved.” This phrase is used in several other places in the NEC and leaves it up to the AHJ as to what is suitable. This language does not add requirements that are difficult, if not impossible, to enforce by adding unclear requirements for rodent-resistance, etc.

Panel Meeting Action: Accept in Principle
Revise 640.6(C) and 640.6(D) of the committee action on Proposal 12-94 to read as follows:

(C) Abandoned Audio Distribution Cables. The accessible portion of abandoned audio distribution cables shall be removed.

FPN: See Article 100 for a definition of Accessible. It is desirable to remove as much abandoned cable as is practical but it is not the intent of this clause to require construction or renovation specifically to facilitate the removal of abandoned cable.

(D) Installed Audio Distribution Cable Identified for Future Use.

1) Cables identified for future use shall be marked with a tag of sufficient durability to withstand the environment involved.

2) Cable tags shall have the following information:

(a) Date cable was identified for future use

(b) Date of intended use

(c) Information relating to the intended future use of cable

Panel Statement: The panel accepts the recommendation of the two task groups who worked extensively on this material. The panel has shown the text to clarify the requirement, since the recommended text of Comment 12-67 is not clearly presented.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

Comment on Affirmative: QUAVE, D.: FPN should be changed to be consistent with CMP-16.

FPN: See Article 100 for definition of Accessible (as applied to wiring methods). It is desirable to remove as much abandoned cable as is practical but it is not the intent of this section to require construction or renovation specifically to facilitate the removal of abandoned cable.

12-69 Log #681 NEC-P12

Final Action: Accept (640.6)

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 12-94

Recommendation: I support the panel action to delete the FPN from the end of 640.6.

Substantiation: The Panel Action and the Panel Statement indicate that the FPN was deleted, however, the NEC 2008 draft at ROP stage still contains the FPN.

Panel Meeting Action: Accept
Panel Statement: The panel acknowledges the deletion of the FPN from the end of the article. The panel notes the panel action text on Proposal 12-94 properly excluded the FPN. (The ROP draft incorrectly contains the FPN.)

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

12-70 Log #888 NEC-P12

Final Action: Accept in Principle (640.6)

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 12-94

Recommendation: Continue to accept in principle in part to delete the FPN.

Substantiation: CMP-12 is correct, the addition of these NECA Fine Print Notes, serves no benefit to the user of the National Electrical Code. The NEC is not a training manual. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement, for generic, readily available, information, which must be purchased by the code user. Code Making Panel 12 has acted to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this fine print note is in direct conflict with 90.1(C). In the action to reject Proposal 8-3, one technical committee member promotes NECA Standards as “... a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. Failure to do so will mean adding Fine Print Notes for IEC, EEI, IBEW, IAEI, ACC, NETA, NEI, SEIA, AISE, API, ASHE, AHAM, ICEAI, NYBFS and dozens of others when they decide to develop income through generic standards development. If this type of fine print note is included in any form, an annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes coupons should be included.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel agrees with the recommendation to maintain the deletion of the FPN. The panel does not agree with the submitter’s substantiation. The panel agrees with the action based on the substantiation provided in Comment 12-69.

The panel notes that changes to Proposal 12-94 have been made through the panel action on Comment 12-67.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12


12-71 Log #2168 NEC-P12

Final Action: Accept in Principle (640.6)


Comment on Proposal No: 12-94

Recommendation: Revise accepted text: (C) Abandoned Audio Distribution Cables. The accessible portion of abandoned audio distribution cables shall be removed.

Substantiation: Cables may be installed in walls or conduit where removal can only be done of the accessible portion.

Panel Meeting Action: Accept in Principle
Panel Statement: Refer to the panel action and statement on Comment 12-67.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12


12-72 Log #864 NEC-P12

Final Action: Accept (640.6, FPN)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 12-95

Recommendation: The panel is encouraged to continue to Accept in Principle Proposal 12-95.

Substantiation: The reasons to continue to Accept in Principle the Proposal are as follows:
ARTICLE 645 — INFORMATION TECHNOLOGY EQUIPMENT

12-75 Log #2169 NEC-P12 Final Action: Reject

(645.2)

Comment on Proposal No: 12-104
Recommendation: Accept the Proposal with stated new wording:

645.2 Definitions.
Abandoned Audio Distribution Cable. The definition in 640.2 shall apply.
Abandoned Class 2, Class 3, and PLTC Cable. The definition in 725.2 shall apply.
Abandoned Fire Alarm Cable. The definition in 760.2 shall apply.
Abandoned Optical Fiber Cable. The definition in 770.2 shall apply.
Abandoned Telecommunications Cable. The definition in 800.2 shall apply.
Abandoned Coaxial Cable. The definition in 820.2 shall apply.
Abandoned Network-Powered Broadband Communications Cable. The definition in 830.2 shall apply.
Abandoned Type DP Cable. Installed Type DP cable that is not terminated at equipment and not identified for future use with a tag.

Substantiation: This Proposal offered definitions of the following types of cables that are referenced in 645D(5)x:

- Class 2, Class 3, and PLTC Cable. Types CL2 (Class 2), CL3 (Class 3), and PLTC (Article 725).
- Fire Alarm Cable Types NPLF and FPL (Article 760).
- Optical Fiber Cable Types OFC and OFN (Article 770).
- Communications Cable Type CM (Article 800).
- Coaxial Cable Type CATV (Article 820).

BICSI designers and installers place these types of cables, as well as, audio distribution cables and network powered broadband cables, in computer rooms.

Panel Meeting Action: Reject
Panel Statement: See panel action on Proposal 12-106, which established a definition of "Abandoned Supply Circuits and Interconnecting Cables." Individual definitions as recommended in the comment are not necessary.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

12-76 Log #83 NEC-P12 Final Action: Accept

(645.4(d))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 12-108
Recommendation: Revise proposal as follows:

645.4(e) Except for lighting and its control, no electrical distribution equipment or wiring, other than that which supplies the IT equipment and its associated equipment, and a dedicated heating/ventilating/air conditioning (HVAC) equipment shall be installed in the room.

Exception No. 1: Lighting and its control shall be permitted to be installed.

Exception No. 2: Communications systems and monitoring systems such as telephones, fire alarm systems, fire extinguishing systems, security systems, water detection systems, and other related protection equipment shall be permitted to be installed.

Exception No. 3: Power wiring, cable and wall-mounted receptacles installed as premises wiring within the walls in accordance with Chapters 1-4 of this Code shall be permitted to be installed.

Substantiation: As written, this requirement would prevent the use of wall outlets in an IT space.
The proponent’s substantiation implies that he might have wanted the stipulation to apply only to power distribution under a raised floor, but the proposal does not say that. Therefore, any non-IT equipment cabling, whether run overhead in racks and cable trays or within raceways inside of walls, would be prohibited.

Furthermore, the proponent talks about wanting to de-energize the entire room via the disconnecting means. That implies that everything in the entire IT space would have to be powered on the critical bus (usually on conditioned, UPS powered power). 645.10 already requires de-energizing “all electronic equipment” in the IT equipment room. The proponent asks us to provide a higher level of protection for normal power than is required in any other part of the Code, simply because it is an IT room with power cabling under a raised floor.

It is inconceivable to have an IT equipment room with no wall outlets.

● Contractors need to run equipment in the room during installation, maintenance, and renovation. Connecting their heat guns, drills, halogen lights, or other tools and test equipment into the conditioned power at best invites a tripped circuit breaker and nuisance alarms, and at worst causes damage to IT data or equipment.

● If there is a water emergency under the floor, wet vacuums must be plugged in somewhere. They cannot be plugged into the critical power bus.

● In the event of a cooling failure, temporary cooling systems might be rolled in to cool hot spots; they must plug into something - certainly not the critical bus!

● Long extension cords through open doors will reduce environmental control, compromise fire protection systems, compromise security, and can damage extension cord insulation.

● One assumes that any IT space created in existing buildings would require removal of all existing wall outlets in order to comply with the revised Article 645.

● Wall mounted receptacles that are installed in an IT environment that are dedicated to service equipment should be allowed and should be supplied from a non-IT dedicated distribution source. (General purpose distribution sources)

● IT spaces should be provided with the same wall-mounted receptacle spacing as required in 210.52(A)(1): no point measured horizontally along the floor line in any wall space should be more than 1.8 m (6 ft) from a receptacle outlet.

As written, the proposal also suggests that only one HVAC device would be permitted, when most of the time there are multiple dedicated air conditioners.

Taken to its extreme, the wording would even prevent the use of UPS systems in an IT room if they were listed as power systems instead of IT equipment.

Finally, as written the proposal would eliminate many other essential, non-IT equipment types, including communication systems, security systems, monitoring systems, fire alarm systems, fire extinguishing systems, water detection systems, etc. The proponent and the panel appear to have not thought through the unintended consequences of this code.

The safety record of IT spaces is extremely good. Proponent has no statistics to justify why more restrictions are required.

See: Marty Ahrens, Computer and Computer Peripheral Fires With a Discussion of Fires, National Fire Protection Association, August 2006. From 1999 to 2003 there were fewer than 30 fires in computer rooms and control spaces. That equates to less than 3 percent of all computer-related fires, less than 0.1 percent of all commercial fires, and less than $200,000 total property damage. That’s a darned good record. If it broke, don’t fix it.

The justification for this proposal is weak and the wording is ill-advised. The proposal should be rejected and returned to sender for rewrite in the next cycle. It is just bad code.

Panel Meeting Action: Reject
Panel Statement: The exceptions as shown in the comment are not necessary due to the action on Comment 12-78. See panel action and statement on Comment 12-78. In addition, the panel does not agree that the action taken during the proposal stage produced “bad code”, rather it reflects the benefits of an open consensus process.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

12-77a Log #2506 NEC-P12 (645.4(6) Exception) Final Action: Reject


Comment on Proposal No: 12-108
Recommendation: Revise the exception to new 645.4(6) to read as follows:

Exception: Communications systems and monitoring systems such as telephone, fire alarm systems, fire extinguishing systems, security systems, water detection systems and other related protective equipment shall be permitted to be installed.

Substantiation: Clarify the fact that monitoring systems should be covered under the exception.

Panel Meeting Action: Accept in Principle
Panel Statement: The revised exception to new 645.4(6) is consistent with the intent of the code.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

12-80 Log #546 NEC-P12 (645.4(6) Exception) Final Action: Accept in Principle

Submitter: Richard P. Owen, City of St. Paul

Comment on Proposal No: 12-116
Recommendation: Revise text to read as follows:

645.5(G)(2) Supply circuits and interconnecting cables should be labeled.

Substantiation: This comment was prepared by a Task Group after further consideration of the comments expressed in the voting as directed by the Technical Correlating Committee. The revised wording of the section was developed by a Task Group consisting of: Thomas Burke, Jeffrey Holmes, Ron Janikowski, Robert Johnson, John Mortimer, and Kenneth White.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 12-80, which meets the intent of the submitter.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

12-78 Log #1986 NEC-P12 (645.4(6) Exception)

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 12-108
Recommendation: This Proposal should have been Rejected or Accepted in Principle with the following revision to the Exception:

Exception (6): Communications, signaling, and fire alarm systems wiring and equipment for control of or connection to equipment related to the information technology room equipment or for required functions shall be permitted.

Substantiation: The proposal is seriously flawed. The panel should give additional consideration to the Explanation of Negative by Mr. Johnson. This proposal creates a direct contradiction with the requirements of 645.5(D)(3), which requires smoke detection, while making an unlimited exception for communications systems (the exception does not require the communications wiring to be related in any way to the IT equipment or the use of the IT room). Also, it could be argued that communications, signaling, and fire alarm wiring is “electrical distribution equipment or wiring,” since it is not clear whether “electrical distribution” modifies just “equipment” or “equipment and wiring.” A strict interpretation of the proposed wording would even prohibit interconnecting data wiring that is usually classified as Class 2 under Article 725 as well as the Class 2 wiring for temperature control for a separate HVAC system as permitted by 645.4(2). Even the wiring for and the EPO devices themselves that are required by 645.4(1) and 645.10 are prohibited since it is often not “electrical distribution equipment or wiring” whatever that means. (The panel should understand that strict, literal interpretations will be applied by some jurisdictions.) The exception should also clearly refer only to (6) in this case (especially since it’s at the end of the list of requirements.)

Panel Meeting Action: Accept in Part
Reject Proposal 12-108.

Panel Statement: The panel accepts the recommendation to reject Proposal 12-108. The panel does not accept the recommendation to accept in principle the recommendation to include a new exception in the comment.

The panel chairman appointed a task group to study the issues raised in the comments. The task group concluded that the best course of action would be to reject the original proposal and revert back to the language of the 2005 NEC.

Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
to require construction or renovation specifically to facilitate the removal of abandoned cable.

645.5G (1) Supply circuits and interconnecting cables identified for future use shall be marked with a tag in accordance with the following:

- Tag is improprius to the effects of temperature and dampness.
- Tag is resistant to the effects of gnawing by rodents.

645.5G (2) Supply circuits and interconnecting cables shall have the following information:

- Information relating to the intended future use

**Substantiation**: This comment was written by a Task Group consisting of Stan Kaufman and Randy Ivan (Panel 16), John Mortimer (Panel 12) and Ron Maassen, Paul Casparo (Panel 3) plus Task Group Chair Richard Owen (Panel 3). The Task Group was directed by the Technical Correlating Committee to examine proposals submitted to all three Panels concerning abandoned cable and other related issues covered by the Panels.

The Task Group came to consensus on the following issues and submitted comments to the Panels as appropriate:

1) On the issue of abandoned cable removal, the task group agreed that only the accessible portions of abandoned cable should be removed. To require removal of all cable could, in some cases, necessitate demolition of the building finish in order to access cables that were properly fastened to the building in accordance with the rules in the various code articles. Furthermore, the task group agreed that the requirements for abandoned cable removal should not be in Section X3 (Locations and Other Articles) but should be relocated into the general requirements of each article.

2) The task group also agreed to recommend the addition of a new Fine Print Note to further explain the removal requirement. This addition was thought to be necessary to avoid confusion with the requirement of abandoned cable removal, the task group agreed that only the accessible portions of abandoned cable should be removed. To require removal of all cable could, in some cases, necessitate demolition of the building finish in order to access cables that were properly fastened to the building in accordance with the rules in the various code articles. Furthermore, the task group agreed that the requirements for abandoned cable removal should not be in Section X3 (Locations and Other Articles) but should be relocated into the general requirements of each article.

Panel Meeting Action: Accept in Principle

Revise 645.5(F) and 645.5(G) to read as follows:

(F) Abandoned Supply Circuits and Interconnecting Cables. The accessible portion of abandoned supply circuits and interconnecting cables shall be removed unless contained in a metal raceway.

FPN: See Article 100 for a definition of Accessible. It is desirable to remove as much abandoned cable as practical, but it is not the intent of this clause to require construction or renovation specifically to facilitate the removal of abandoned cable.

(G) Installed Supply Circuits and Interconnecting Cables Identified for Future Use.

(1) Supply circuits and interconnecting cables identified for future use shall be marked with a tag of sufficient durability to withstand the environment involved.

(2) Supply circuit tags and interconnecting cable tags shall have the following information:

- Date identified for future use
- Date of intended use
- Information relating to the intended future use

Panel Statement: The panel accepts the recommendation of the two task groups who worked extensively on this material. The panel has revised the text to clarify the requirement, since the recommended text of Comment 12-80 is not clearly presented.

Final Action: Accept

**Number Eligible to Vote: 12**

**Ballot Results: Affirmative: 12**

12-81 Log #665 NEC-P12 Final Action: Accept (645.5C(6))

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 12-109

Recommendation: The panel is encouraged to continue to reject Proposal 12-109.

**Substantiation**: The reasons to continue to Reject the Proposal are as follows:

1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals were directed by the Technical Correlating Committee to inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.

5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).

6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Accept

Panel Statement: The panel agrees with the recommendation to maintain the deletion of the FPN. The panel does not agree with the submitter’s substantiation. The panel reaffirms its statement on Proposal 12-109.

**Number Eligible to Vote: 12**

**Ballot Results: Affirmative: 12**

12-82 Log #688 NEC-P12 Final Action: Accept (645.5D(5)(New))

Submitter: Timothy M. Crouchore, Allegheny Power

Comment on Proposal No: 12-114

Recommendation: Revise the main text of 645.5D(5) to read as follows:

(D) Under Raised Floors. Power cables, communications cables, connecting cables, interconnecting cables, cord-and-plug connections, and receptacles associated with the information technology equipment shall be permitted under a raised floor, provided the following conditions are met:

- Add a new (3) ahead of the existing (3). Renumber existing (3) through (6) to (4) through (7).
- The new (3) is as follows:

- Supply cords of listed information technology equipment in accordance with 645.5B.

- Revise the text of existing (4) and renumber it to (5) as recommended above. The revised text and revised number are as follows:

- (5) Openings in raised floors for cords and cables protect cords and cables against abrasion and minimize the entrance of debris beneath the floor.

**Substantiation**: These suggested revisions comply with the intent of the original submitter. These panel revisions are discussed in my affirmative ballot comment. Cords are manufactured differently than cables due to the requirements for flexibility of the cord. There is confusion in the industry whether cord-and-plug connections from listed information technology equipment supply cords are permitted under the raised floor. This proposal permits listed cords under a raised floor where the length of the supply cord and attachment plug cap does not exceed 15 feet in length. Should any portion of the cord be on the surface of the raised floor, the requirement for protection from physical damage would apply.

Panel Meeting Action: Accept

**Number Eligible to Vote: 12**

**Ballot Results: Affirmative: 12**

12-83 Log #789 NEC-P12 Final Action: Accept in Principle (645.5D(5)(d))

Submitter: Stephen McCluer, American Power Conversion Corp.

Comment on Proposal No: 12-114

Recommendation: Revise the proposal as follows:

(d) Power supply cords of listed information technology equipment plugged into receptacles under the raised floor when only the portion of the cord required to make the vertical connection occupies the plenum free air space area under the raised floor. Cord assemblies shall be protected from damage and shall not be permitted to be submerged.

**Substantiation**: This revision removes the panel’s justification for rejecting the original proposal. Despite the chairman’s observation that the NEC does not prohibit power supply cords from listed IT equipment from being plugged into receptacles under a raised floor, it is, in fact, a practice in some jurisdictions to prohibit such cord assemblies under raised floors. We request this clarification to ensure uniform enforcement of the Code.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 12-82, which meets the intent of the submitter.

**Number Eligible to Vote: 12**

**Ballot Results: Affirmative: 12**

12-84 Log #795 NEC-P12 Final Action: Accept in Principle (645.5D(5)(d))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 12-103

Recommendation: This proposal should have been Accepted.

**Substantiation**: The panel statement to “see the panel action and statement on proposal 12-114” is not responsive to this proposal. As stated in the Comment on Affirmative by Mr. Crouchore, the NEC does not prohibit cords in raised floors. And as stated in the Explanation of Negative by Mr. Johnson, the panel repeatedly refused to make this issue clear. In fact, the NEC specifically permits the receptacles to which the cords must attach to be in the raised floor according to 645.5(D), but the wiring methods permitted in 645.5 do not include any mention of flexible cords. If the receptacles are to be installed in...
the underfloor space, it follows that the cords must also be permitted there, and cords are permitted by 645.5(B). However, without a modification here, the restrictions of 400.8(2) and (5) apply and the cord may not be run through the floor assembly into the below-floor area, even if protected as required by 645.5(D). The proposal adds clarity and actually restricts the use of cords to that portion required to make the connection, but is not as restrictive and does not raise the issues to which the panel objected in Proposal 12-114. In fact, none of the issues addressed in the panel statement in Proposal 12-114 are raised by this proposal. The panel statement implies that cords may be used and objects to the increased restrictions, yet the panel refuses to make the permission clear. The first two sentences of the Comment on Affirmative by Mr. Jones are true, and enough reason to resolve this issue, however the rest of the comment is immaterial - no new information is necessary to clarify this long-standing issue.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action on Comment 12-82, which meets the intent of the submitter.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

12-85 Log #84 NEC-P12 Final Action: Accept (645.5(F))  
Submitter: Technical Correlating Committee on National Electrical Code  
Comment on Proposal No: 12-116  
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: This panel accepts the direction of the TCC. See panel action and statement on Comment 12-80.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

12-86 Log #1863 NEC-P12 Final Action: Accept in Principle in Part (645.5(F))  
Submitter: Michael Walls, American Chemistry Council  
Comment on Proposal No: 12-116  
Recommendation: Revise text to read as follows:

645.5G
(1) Cables identified for future use shall be marked with a tag in accordance with the following:

- 640.6D (1) Tag is impervious to the effects of temperature and dampness
- 640.6D(1)b Tag is resistant to the effects of growing rodents

(2) Cables shall have the following information on the tag or in a database
(a) Date cable was identified for future use
(b) Date of intended future use
(c) Information relating to the intended future use of cable

Substantiation: To obtain a tag with the above requirements would be very difficult and why not use language that is already in the code of sufficient durability to withstand the environment.

Also it is impractical to predict when a spare cable will be used. That requirement would be very difficult to enforce and would require monitoring to see if the date has passed.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel accepts the recommendation to delete (D)(1)a and (D)(1)b. The panel disagrees with the deletion of the date of intended use. A cable with no expected date of future use is abandoned. The panel also disagrees with the inclusion of “or in a database” as a way to identify the information on the tag. Databases may not be readily available.

See panel action and statement on Comment 12-80.

Number Eligible to Vote: 12  
Ballot Results: Affirmative: 12

12-87 Log #790 NEC-P12 Final Action: Accept (645.10(f))  
Submitter: Stephen McCluer, American Power Conversion Corp  
Comment on Proposal No: 12-120  
Recommendation: Modify the original proposal as follows: 645.10 Disconnecting Means. An approved means shall be provided to disconnect power to all electronic equipment in the information technology equipment room or in designated zones within the room. There shall also be a similar approved means to disconnect the power to all dedicated HVAC systems serving the room or designated zones and shall cause all required fire/smoke dampers to close. The control for these disconnecting means shall be grouped and identified and shall be readily accessible at the principal exit doors. A single means to control both the electronic equipment and HVAC systems in the room or in a zone shall be permitted. Where a pushbutton is used as a means to disconnect power, pushing the button in shall disconnect the power. Where multiple zones are created, each zone shall have an approved means to confine fire or products of combustion to within the zone.

Exception No. 1: Installations qualifying under the provisions of Article 665.

Exception No. 2: Installations qualifying under the provisions of paragraph 645.10(c).

- Add a new paragraph 645.10(a)(4).

645.10 Zone disconnect means. An approved disconnect means shall be permitted to disconnect power only to an isolated portion of the information technology room when the following conditions are met:
- (1) The disconnect means shall completely remove all power to the isolated portion of the room (which can be one equipment or a common group of equipment’s) with a single means of disconnect
- (2) Manual or automatic disconnect means shall be permitted
- (3) Manual disconnect means shall be accessible in a manner acceptable to the authority having jurisdiction
- (4) The disconnect means may include an approved method to prevent accidental or unauthorized activation
- (5) Manual disconnect means shall be clearly identified with signage so that emergency procedure operating points are identified
- (6) Method of operation shall be well documented and staff shall be trained
- (7) The location of all zoned disconnect means in the IT room shall be identified in a manner that they are easily located by emergency responders
- (8) All zones with an isolated disconnect means contain an approved method of preventing the spread of smoke and products of combustion beyond the zone for a specified period of time.

Substantiation: This modification removes the panel’s justification for rejecting the original proposal, which stated “it is too complicated and would be difficult to enforce.” It eliminates the proposed exception and moves the language into the body of the main paragraph. The proposal codifies practices that are already in use, and it recognizes the technology that is available today.

The proposal does not replace the existing method. It allows an alternative construction which must be approved by the AHJ(s).

Zoned shutdown is already widely used in telecommunications facilities. It usually involves pre-review with the AHJ(s), special signs, posted instructions, and clear identification of the zones, or anything else that satisfies the AHJ that an equivalent level of safety is provided. Some facilities use special floor markings to guide fire fighters to the affected zone. The means still exists to shut down power and air to the entire room if necessary.

Technology today has the ability to control electricity and cooling with extreme precision. The existing requirement for disconnecting means has changed very little in almost 50 years, when NFPA 75 and NEC Article 645 were created for the protection of mission-critical operations. It is time for the Code to reflect reality.

This amendment will actually improve safety, because it will encourage instead of discourage the use of Article 645. Many people today choose not to build ITE rooms per Article 645 because they do not want a single point of failure capable of shutting down their entire mission-critical operation. This modified proposal gives a reasonable balance of safety and business continuity.

Panel Meeting Action: Accept  
Number Eligible to Vote: 12  
Ballot Results: Affirmative: 10: Negative: 2

Explanation of Negative:  
JANIKOWSKI, R. I am still under the opinion that this would be very hard to enforce. What are they defined? How would emergency personnel know where each zone starts and stops? Where would the emergency shutoff disconnect be located for each zone? The Code does not require posted floor plans to identify each zone and is there any maximum number of zones permitted?

LOTTMANN, T.: The panel action on this comment should have been reject. This comment places an excessive burden on the authority having jurisdiction, as there is no consensus National standard cited for the creation of zones in information Technology Rooms. In addition, no technical substantiation has been provided to show the revised language would improve the safety of persons and property over the existing language. Monetary losses should not be used as substantiation for change as they are outside the committee scope and purpose of this code.

ARTICLE 647 — SENSITIVE ELECTRONIC EQUIPMENT

12-88 Log #1948 NEC-P12 Final Action: Reject (647.7(A)(4))  
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.  
Comment on Proposal No: 12-127  
Recommendation: Reject the proposal, or accept its implicit second option.

Substantiation: It is actually unclear what took place under this proposal because the proposal submitter offered the panel a choice and the panel action was a straight accept. This comment assumes that the last sentence was deleted.
The intent of the original drafters of this provision, however, was more in line with the proposal submitter’s second option. Because NEMA has not yet produced a plug and receptacle configuration in accordance with this provision, the allowance for conventional receptacles was included as a transitional step. Since these receptacles allow any 120V load to be connected, and since any connected load that does not have a two-pole unit switch (e.g. Edison-base lampholders) will be at 60V to ground internally, the idea is that only qualified personnel should be using them. CMP 12 needs to decide whether to force these systems into disconnection by deleting the lined-out text (thereby leaving the unique configuration as the only connection method), or reinstating the transitional language, perhaps with a sunset date to try to elicit a response from the receptacle industry.

**Panel Meeting Action:** Reject

**Panel Statement:** The action taken on Proposal 12-127 is clear, and the panel rejects this comment since it fails to comply with 4.4.5(c) of the Regulations Governing Committee Projects, as the comment does not offer a clear recommended action.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

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**ARTICLE 660 — X-RAY EQUIPMENT**

**12-89 Log #532 NEC-P12**

**Final Action:** Reject

**(660.5)**

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 12-132

**Recommendation:** Accept as revised:

An approved disconnecting means that simultaneously disconnects all ungrounded conductors of the circuit with an amperage rating for at least... (remainder unchanged).

**Substantiation:** Since the panel declined to accept a limitation to a switch or circuit breaker, simultaneous disconnection should be specified, as it may be inferred that other sections that require this are modified.

**Panel Meeting Action:** Reject

**Panel Statement:** The submitter has not provided adequate substantiation to justify the revision recommended in this comment, which would require simultaneous disconnection.

**Number Eligible to Vote:** 11

**Ballot Results:** Affirmative: 11

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**ARTICLE 665 — INDUCTION AND DIELECTRIC HEATING EQUIPMENT**

**12-90 Log #531 NEC-P12**

**Final Action:** Reject

**(665.12)**

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 12-137

**Recommendation:** Accept as revised:

An approved disconnecting means that simultaneously disconnects all ungrounded conductors of the circuit shall be... (remainder unchanged).

**Substantiation:** Since the panel declined to accept a limitation to a switch or circuit breaker, simultaneous disconnection should be specified, as it may be inferred that other sections that require this are modified.

**Panel Meeting Action:** Reject

**Panel Statement:** The submitter has not provided adequate substantiation to justify the revision recommended in this comment, which would require simultaneous disconnection.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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**12-91 Log #1249 NEC-P12**

**Final Action:** Reject

**(665.26)**

**Submitter:** Neil F. LaBrake, Jr., Syracuse, NY

**Comment on Proposal No:** 12-1

**Recommendation:** Reject the Panel’s action on 665.26 and keep the original proposed text.

**Substantiation:** The Panel’s action on 665.26 creates redundant use of the word “bonding” in the sentence. The term “connecting” is appropriate according to the Panel action on Proposal 5-2 for the definition of the term “bonded (bonding)” and is consistent with the NEC TCC Task Group on Grounding and Bonding’s original initiative.

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Bokser; Daleep Mohla; Phil Simmons; Christopher Hutches; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

**Panel Meeting Action:** Reject

**Panel Statement:** The word “bonding” is defined as a particular type of “connecting.” The ROP panel action reflects the intended meaning and is consistent with respect to the particular technology addressed in Article 665.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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**ARTICLE 668 — ELECTROLYTIC CELLS**

**12-92 Log #526 NEC-P12**

**Final Action:** Reject

**(668.6(C)(3))**

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 12-141

**Recommendation:** Accept the addition of:

Substantiation: Metal enclosures of associated equipment are not required to comply with Article 250 per 668.6(3)(C) while 668.11(B) indicates metal enclosures associated with the cell line dc power circuits shall be grounded.

**Panel Meeting Action:** Reject

**Panel Statement:** The existing wording has not caused confusion in this specialized industry. There is no substantiation that the proposed wording adds more clarity. Grounding of power supply enclosures is specifically described in 668.11(B).

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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**12-93 Log #473 NEC-P12**

**Final Action:** Reject

**(668.15)**

**Submitter:** Dan Leaf, Seneca, SC

**Comment on Proposal No:** 12-142

**Recommendation:** Accept revised:

For equipment, apparatus, and structural components that are required to be grounded the provisions of Article 250 shall apply except a water pipe electrode shall not be required to be used. Any electrode or combinations of electrodes described in 250.52 shall be permitted.

Substantiation: Equipment that is grounded by choice (not required) should also comply with Article 250 since 250.1 (1) indicates Article 250 covers “permitted” grounding and this section may be deemed to modify that. The reference to water pipe electrodes is superfluous since “any” electrode is permitted.

**Panel Meeting Action:** Reject

**Panel Statement:** Water pipe electrodes must be an option. In some of the industry, ground leakage current of the process can destroy the water piping. In other sections of the industry, the water piping is purposely isolated from ground.

**Number Eligible to Vote:** 12

**Ballot Results:** Affirmative: 12

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**12-94 Log #497 NEC-P12**

**Final Action:** Reject

**(668.30(D))**

**Panel Meeting Action:** Accept

**Panel Statement:** Number Eligible to Vote: 12

**Ballot Results:** Affirmative: 7 Negative: 5

**Explanation of Negative:**

CROUSSHORE, T.: Upon review of the Negative Ballot statements on Comment 12-94 by Mr. Givens, Mr. Mortimer, Mr. Prichard, and Mr. White, I am changing my vote from affirmative to negative. I agree with their statements. The submitter has not provided any records or case histories of problems existing in the electrolytic cell industry from the current wording of 668.30(D). Furthermore, since the current wording in the NEC is also contained in NFPA 70E and IEEE 463, it would be preferable to keep all three standards consistent in wording and intent. The circuit protection mentioned in 668.30(D) is not just limited to overcurrent protection.

GIVENS, K.: The author of this Comment 12-94 does not provide substantiation that the existing wording is inadequate for this specialized industry. The issue cited has never been brought up by the electrolytic cell industry.

MORTIMER, J.: No technical substantiation for approval of this comment was provided.
17-60 Log #2096 NEC-P17 Final Action: Reject

17-60 Log #2096 NEC-P17

Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 17-172
Recommendation: Accept proposed text from Proposals 17-59, 17-60 and either 17-171 or 17-172 as a package to address the lack of electrical requirements for Baptisteries.
Substantiation: When the proposals above were submitted, the bulleted items were inadvertently attached to the substantiation an obviously were not intended to apply to these proposals. While the panel action on proposal 17-60 revises the definition of permanently installed and storable pools to include immersion pools, the scope of Article 680 does not seem to include the vessels of concern. Without a revision to the scope, it seems difficult to apply the definition to these vessels. When I look at the installations, it would also be difficult to determine which part of the current Article 680 would apply to these installations. Two options were provided in Proposals 17-171 and 17-172.

ARTICLE 680 — SWIMMING POOLS, FOUNTAINS, AND SIMILAR INSTALLATIONS

17-59 Log #2037 NEC-P17 Final Action: Reject

17-59 Log #2037 NEC-P17

Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 17-171
Recommendation: Accept proposed text from proposal 17-59, 17-60 and either 17-171 or 17-172 as a package to address the lack of electrical requirements for Baptisteries.
Substantiation: When the proposals above were submitted, the bulleted items were inadvertently attached to the substantiation, an obviously we were not intended to apply to these proposals. While the panel action on Proposal 17-60 revises the definition of permanently installed and storable pools to include immersion pools, the scope of Article 680 does not seem to include the vessels of concern. Without a revision to the scope, it seems difficult to apply the definition to these vessels. When I look at the installations, it would also be difficult to determine which part of the current Article 680 would apply to these installations. Two options were provided in Proposals 17-171 and 17-172.

ARTICLE 675 — ELECTRICALLY DRIVEN OR CONTROLLED IRRIGATION MACHINES

19-58 Log #649 NEC-P19 Final Action: Reject

Submitter: Linda J. Little, St. Louis, MO
Comment on Proposal No: 19-137
Recommendation: This proposal should be Accepted in Principle. A new sentence should be added before the last sentence to read as follows: “Portable means for adding a lock to the disconnecting means shall not be permitted.”
Substantiation: There should be consistency between similar rules in the NEC that call for the disconnecting means to be capable of being locked in the open position. New language accepted by Code-Making Panel 12 should also be adopted here to clarify that portable units are unacceptable. See language accepted by Code-Making Panel 12 (Proposal 12-136) for this same purpose.
Panel Meeting Action: Reject
Panel Statement: The panel contends that the language in the original proposal correlates with the language in 430.102(B), Exception and that the language in Proposal 19-137 is adequate without the additional sentence.
Number Eligible to Vote: 8
Ballot Results: Affirmative: 7 Negative: 1
Explanation of Negative: LITTLE, L.: The panel should have accepted in principle with the revised sentence: “Portable means for adding a lock to the disconnecting means shall not be permitted as the means required to be installed at and remain with the equipment.”

Additionally, the language clarifies that this section does not restrict the use of portable accessory features that workers carry to provide for the attachment of multiple locks to the provision installed at the switch or circuit breaker.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 17-63.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 17-63.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-62 Log #1949 NEC-P17 Final Action: Reject
(680.2)
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-62
Recommendation: Accept the proposal.
Substantiation: The panel statement is not responsive. The submitter is aware that if water circulation fails, the water level can rise to the brim. This is a very unusual event. It should not be the basis for setting the rules in Article 680. Going to the actual flood level is akin to setting the datum plane in Article 682 at some height that reflected water height in a 100-yr flood. When the permeable media in the swimming pool junction box was lowered, it was done with enough vacant space in the conduit risers that an unusual water event would not compromise the box, and a reasonable result came out of the process. Now, through the adoption of this definition, those earlier results have been nullified, without substantiation. CMP 17 needs to reconsider the definition.

Panel Meeting Action: Reject
Panel Statement: The panel concludes that the current definition provides the appropriate level of safety. The maximum water level as currently defined can occur as a result of natural events such as heavy rainfall as well as failure of the recirculation system. The definition of “Maximum Water Level” was added in the 2002 edition; it did not change the level intended by the panel.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-63 Log #2038 NEC-P17 Final Action: Reject
(680.2)
Submitter: Donald Cook, Shelby County Building Inspections
Comment on Proposal No: 17-60
Recommendation: Accept proposed text from proposal 17-59, 17-60 and either 17-171 or 17-172 as a package to address the lack of electrical requirements for Baptisteries.
Substantiation: When the proposals above were submitted, the bulleted items were inadvertently attached to the substantiation an obviously were not intended to apply to these proposals. While the panel action on proposal 17-60 revises the definition of permanently installed and storable pools to include immersion pools, the scope of Article 680 does not seem to include the vessels of concern. Without a revision to the scope, it seems difficult to apply the definition to these vessels. When I look at the installations, it would also be difficult to determine which part of the current Article 680 would apply to these installations. Two options were provided in proposal 17-171 and 17-172. While I understand the practical difficulty of dealing with the various religious practices related to baptism, the proposed definition attempts to address the electrical safety concerns that are similar to those found with swimming pools, spas, hot tubs, hydromassages, and fountains and at the same time realizes that some religious practices related to baptism do not pose the same risk as others. There was no attempt to infer that one practice or the other should be used, but to provide electrical safety where persons are immersed. It was brought to my attention after I made the proposal, that some religious groups wade into a vessel and while standing in the vessel, are sprinkled rather than being immersed. It would seem the definition should be revised to include persons standing or immersed in these vessels. Pictures will be provided for reference. (Note: No pictures were received by NFPA with this Comment).

Panel Meeting Action: Reject
Panel Statement: The panel action in Proposal 17-60 addressed the submitter’s concern by modifying the definitions of Pools; Permanently Installed Swimming, Wading, Immersion Pool Pools; and Storable Swimming, Wading or Immersion Pool in 680.2. Pools used in religious practices involving wading or immersion would fall under one of these definitions.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-64 Log #211 NEC-P17 Final Action: Accept
(Table 680.3)
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 17-63
Recommendation: The Technical Correlating Committee directs that the Panel reconsider and correlate with the Panel Action on Proposals 8-53 and 8-78. This action will be considered by the Panel as a Public Comment.

Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel accepts the recommendation of the Technical Correlating Committee to reconsider. See the panel action and statement on Comment 17-65.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-65 Log #1389 NEC-P17 Final Action: Accept in Principle in Part
(Table 680.3)
Submitter: William Wagner, Certification Solutions
Comment on Proposal No: 17-63
Recommendation: This Proposal should be Accepted as originally proposed.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Section or Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring Junction box support</td>
<td>314.23</td>
</tr>
<tr>
<td>Rigid nonmetallic conduit</td>
<td>352.12, 353.12, 355.12</td>
</tr>
<tr>
<td>Audio Equipment Adjacent to pools and fountains</td>
<td>Article 640, Parts I and II</td>
</tr>
<tr>
<td>Underwater speakers*</td>
<td>640.10</td>
</tr>
</tbody>
</table>

*Underwater loudspeakers shall be installed in accordance with 680.27(A).

Substantiation: In accordance with CMP-8’s actions on Proposals 8-53 and 8-78, Article 352 will now apply to “Rigid Polyvinyl Chloride Conduit: Type PVC”, and Article 353 will continue to apply to “High Density Polyethylene Conduit: Type HDPE” and Article 355 will now apply to “Reinforced Thermosetting Resin Conduit: Type TRRC”. Prior to the separation of these Articles for the 2005 and 2008 editions of the NEC, each of these conduit Types was included in Article 352 as “Rigid Nonmetallic Conduit: Type RNC.” Therefore, it is necessary to revise the reference in Table 680.3 as noted above.

This will correlate with the TCC Action on Proposal 17-63.

Panel Meeting Action: Accept in Principle in Part
A. Modify Current Table 680.3 as follows:
1. Revise the words “Rigid nonmetallic conduit” to become “Rigid polyvinyl chloride conduit (Type PVC)”
2. Add a new line to read:
   “Reinforced thermosetting resin conduit (Type TRRC)” under Topic, and “355.12” under Section or Article. E.
B. Replace the words “rigid nonmetallic conduit” in Article 680 in accordance with the instructions in the following table:
   Table for inclusion in the committee action on Comment 17-65

<table>
<thead>
<tr>
<th>Section</th>
<th>Replace</th>
<th>With</th>
</tr>
</thead>
<tbody>
<tr>
<td>680.21(A)(1)</td>
<td>“Rigid nonmetallic conduit”</td>
<td>“rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit”</td>
</tr>
<tr>
<td>680.23(F)(1)</td>
<td>“or rigid nonmetallic conduit”</td>
<td>“rigid polyvinyl chloride conduit or reinforced thermosetting resin conduit”</td>
</tr>
<tr>
<td>680.25(A)</td>
<td>“or rigid nonmetallic conduit”</td>
<td>“rigid polyvinyl chloride conduit or reinforced thermosetting resin conduit”</td>
</tr>
<tr>
<td>680.27(A)(2)</td>
<td>“or rigid nonmetallic conduit”</td>
<td>“rigid polyvinyl chloride conduit or reinforced thermosetting resin conduit”</td>
</tr>
<tr>
<td>680.27(A)(2)</td>
<td>“rigid nonmetallic conduit”</td>
<td>“rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit”</td>
</tr>
</tbody>
</table>

Panel Statement: The panel accepts in principle the addition of 355.12 and rejects the addition of 353.12. High density polyethylene conduit, addressed by Article 353, was never permitted by Article 680. The panel has incorporated the changes in Table 680.3 to account for the use of rigid polyvinyl chloride conduit and reinforced thermosetting resin conduit and has also provided correlating changes for terminology throughout Article 680. This action is based on the continued acceptance of Proposals 8-53 and 8-78. It is recommended that the Technical Correlating Co correlate accordingly if this is not the case.

It is also recommended that the TCC consider the use of “RPVCC” instead of PVC to be consistent with acronyms used for other wiring methods and to prevent confusion with the generic compound pvc.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
17-66 Log #346 NEC-P17  Final Action: Accept in Principle
(680.7)

TCC Action: The Technical Correlating Committee understands that the panel action on Proposal 17-67 deleted “an” and “(lighting fixture)”, and made “luminaire” plural. The panel action on Comment 17-66 added the text “and-plug-connection.”

The final text reads as follows:

“Fixed or stationary equipment, other than underwater luminaires, for a permanently installed pool shall be permitted to be connected with a flexible cord and plug to facilitate the removal or disconnect for maintenance or repair.”

Submitter: L. Keith Loeland, International Association of Electrical Inspectors

Comment on Proposal No: 17-66

Recommendation: Revise text to read as follows:

17-67 Log #424 NEC-P17  Final Action: Accept in Principle
(680.7)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-66

Recommendation: Accept proposal.

Substantiation: The text should be consistent with the heading which includes “and plug”. The literal text excludes underwater fixtures from being cord connected as it states: “other than an underwater luminaire shall be permitted to be connected with a flexible cord.”

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 17-66.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-68 Log #530 NEC-P17  Final Action: Reject
(680.7)

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-66

Recommendation: Accept the proposal as revised:

Fixed or stationary equipment other than underwater luminaires (lighting fixtures) shall be...(remained unchanged).

Substantiation: Reference to underwater luminaires is unnecessary since the heading covers plug-connected equipment and (A) limits cord length to 3 ft. 680.29 does not appear to provide for plug connections.

Panel Meeting Action: Reject

Panel Statement: The panel does not agree with the submitter’s substantiation. The language suggested for deletion needs to be retained to make it clear that underwater luminaires are NOT addressed by this section.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-69 Log #902 NEC-P17  Final Action: Reject
(680.8 Exception (New))

Submitter: Terry L. Schneider, Pikes Peak Regional Building Department

Comment on Proposal No: 17-73

Recommendation: 680.8(A) Power. With respect...Figure 680.8.

Exception: Self-contained Spa or Hot Tub. The minimum clearances for overhead conductors shall be reduced to 3.0 m (10 ft) above the water level for self-contained spas or hot tubs.

Substantiation: In the National Electrical Safety Code, section 234(C)(3), it covers the overhead clearances of utility wires over decks and similar structures and have attached an interpretation from Committee C2. They are in agreement that the clearances are not required for the same reasons as the original submitter. There is a conflict between the NESC and the NEC and II recommend that Panel 17 reconsider this proposal to bring the 2 standards into agreement.

Not Supporting Material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement: The panel continues to reject this change. Often spas and swim spas are located in close proximity to pools and the same tools used for pool maintenance are often used for spas. NESC interpretations do not pertain to NEC Article 680.

Number Eligible to Vote: 11
Ballot Results:

17-70 Log #455 NEC-P17  Final Action: Accept in Principle
(680.12)

TCC Action: The Technical Correlating Committee understands that the final text of 680.12 includes both of the panel actions on Comments 17-70 and 17-71.

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 17-79

Recommendation: Accept proposal or revision as follows:

One or more approved means to simultaneously disconnect all ungrounded conductors of the circuit shall be provided...(remained unchanged).

Substantiation: Since the panel declined to accept a requirement for a switch or circuit breaker, the means should be specifically required to be approved. Simultaneous disconnection should be specified since literal wording, infers that two or three individual disconnecting means may be used. Utilization equipment includes signs within fountains which require a switch or circuit breaker disconnecting means per 600.6. Since this rule is in Chapter 6, it may be construed as amending other sections requiring simultaneous disconnect.

Panel Meeting Action: Accept in Principle

Revise 680.12 to read as follows:

680.12 Maintenance Disconnecting Means. One or more means to simultaneously disconnect all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be readily accessible and within sight from its equipment.

Panel Statement: The revised language more clearly presents the requirement and meets the intent of the submitter.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-71 Log #1950 NEC-P17  Final Action: Accept in Principle
(680.12)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 17-80

Recommendation: Add the following phrase at the end of the last sentence: “unless separated from the open water by a permanently installed barrier that provides equal or better separation.”

Substantiation: The reason the 5-F requirement was removed was that this disconnect applies throughout Article 680, and frequently the best place for it might be under the skirt of a commercial hot tub, for example. Such a location might only be one foot, measured horizontally, from the body of water, but there would be no hazard to a swimmer or bather. This suggested wording might adequately bridge the prior history and the submitter’s concerns.

Panel Meeting Action: Accept in Principle

Revise 680.12 to read as follows:

680.12 Maintenance Disconnecting Means. One or more means to disconnect all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be readily accessible and within sight from its equipment.

Panel Statement: It is the intent of the panel to regulate the locations of disconnects as stated in the panel action text. The panel disagrees with the submitter’s substantiation. The scenario suggested would still allow maintenance personnel to come in contact with the water while operating the disconnect.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-72 Log #1951 NEC-P17  Final Action: Accept
(680.21)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 17-81

Recommendation: Do not convert any existing text into an exception, nor change the order of any text. Instead, add the following sentence as action text for 680.21(A):

70-395
General. The branch circuits for pool-associated motors shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or Type MC cable listed for the location. Other wiring methods and materials shall be permitted in specific locations or applications as covered in this section. Any wiring method employed shall contain an insulated copper equipment grounding conductor sized in accordance with 250.122 but not smaller than 12 AWG.

Exception: In the interior of dwelling units, or in the interior of accessory buildings associated with a dwelling unit, any of the wiring methods recognized in Chapter 9 of this Code that comply with the provisions of this section shall be permitted. Where run in a cable assembly, the copper equipment grounding conductor not smaller than 12 AWG shall be permitted to be uninsulated, but it shall be enclosed within the outer sheath of the cable assembly. [ROP 17-81]

Substantiation: Adding the text will work this section of the code similar to 680.42(C).

Panel Meeting Action: Reject
Panel Statement: The panel has reinstated item (4) of 680.21(A) in the action on Comment 17-72. In addition, the requirement for a copper equipment grounding conductor with a minimum size of 12 AWG is already contained in item (1) of 680.21(A).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

TCC Action: The Technical Correlating Committee understands that the panel’s action to Accept Proposal 17-85 deletes the second sentence of 680.22(A)(5) in the 2005 NEC:

“Receptacles that supply pool pump motors and that are rated 15 or 20 amperes, 125 volts through 250 volts, single phase, shall be provided with GFCI protection.”

Submitter: Brian Myers, IBEW Local Union 98
Comment on Proposal No: 17-85
Recommendation: This proposal should have been accepted.
Substantiation: Receptacle fed pump motors are already required to be GFCI protected. Hard wired pump motors present the same hazards due to the highly corrosive nature. Pump motor seals have a limited life due to chlorines in the corrosive nature.

The stated purpose of the NEC is “the practical safeguarding of persons and property from hazards” it is practical to provide the same level of protection for a hard wired pump motor that is afforded to a cord and plug connected pump motor.

Panel Meeting Action: Accept
Panel Statement: As a part of the panel’s consideration of this comment, the panel noted a “Compilation of Data from the U.S. Consumer Product Safety Commission National Injury Information Clearinghouse” that was assembled by a task group of the panel.
Note: Supporting material is available for review at NFPA Headquarters.

Report on Comments A2007 — Copyright, NFPA

(A) Wiring Methods. The wiring to a pool motor shall comply with (1) unless modified for specific circumstances by (2), (3), (4), or (5).

Substantiation: The proposal submitter is correct in observing that (4) is, in effect, a reiteration of (1). The problem is that the other numbered paragraphs are as well. The simplest way out is to add the suggested parent text to (1), allowing the succeeding numbered paragraphs to complete the requirements.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-73 Log #2216 NEC-P17 Final Action: Reject
(680.21(A)(1) Exception)

Submitter: Jeff Fitzloff, State of Idaho Division of Building Safety
Comment on Proposal No: 17-81
Recommendation: Revise text to read as follows:
680.21 Motors.
(A) Wiring Methods.
(1) General. The branch circuits for pool-associated motors shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or Type MC cable listed for the location. Other wiring methods and materials shall be permitted in specific locations or applications as covered in this section. Any wiring method employed shall contain an insulated copper equipment grounding conductor sized in accordance with 250.122 but not smaller than 12 AWG.

Exception: In the interior of dwelling units, or in the interior of accessory buildings associated with a dwelling unit, any of the wiring methods recognized in Chapter 9 of this Code that comply with the provisions of this section shall be permitted. Where run in a cable assembly, the copper equipment grounding conductor not smaller than 12 AWG shall be permitted to be uninsulated, but it shall be enclosed within the outer sheath of the cable assembly. [ROP 17-81]

Substantiation: Adding the text will work this section of the code similar to 680.42(C).

Panel Meeting Action: Reject
Panel Statement: The panel has reinstated item (4) of 680.21(A) in the action on Comment 17-72. In addition, the requirement for a copper equipment grounding conductor with a minimum size of 12 AWG is already contained in item (1) of 680.21(A).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-74 Log #212 NEC-P17 Final Action: Accept
(680.22)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 17-85
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Code Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation of the Technical Correlating Committee to give further consideration to the comments expressed in voting. See panel action and statement on Comment 17-75.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-75 Log #1663 NEC-P17 Final Action: Accept
(680.22)

TCC Action: The Technical Correlating Committee understands that the panel’s action on Comment 17-75 to Accept Proposal 17-85 deletes the second sentence of 680.22(A)(5) in the 2005 NEC:

“Receptacles that supply pool pump motors and that are rated 15 or 20 amperes, 125 volts through 250 volts, single phase, shall be provided with GFCI protection.”

Submitter: Alan Manche, Square D Company
Comment on Proposal No: 17-85
Recommendation: Accept the Proposal
Substantiation: Based on the panel statement and the panel member negatives on this topic, it is clear that protection was clearly reduced from the 1999 NEC to the 2002 NEC. The panel statement indicates that the general assembly rejected this issue on the floor. The issue on the floor had nothing to do with the original GFCI protection but the wording that was being presented. The NFPA Electrical Panel supported the reinstatement of GFCI protection on hard-wire pump motors. The wording has been corrected for this cycle and should be accepted. There has been no evidence or substantiation presented that would support removing this protection.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 17-75
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 2
Ballot Not Returned: 1 Gill, C.
17-77 Log #900 NEC-P17 Final Action: Accept in Principle (680.22(A)(5))


Comment on Proposal No: 17-91

Recommendation: Revise as follows:

Receptacles (and branch circuits) that supply pool pump motors...15 or 20 amps, 125-250 volts shall be provided with GFCI protection.

Substantiation: The problem with pool pump motors, whether “hardwired” or connected by cord and plug to a receptacle are typically in a wet and corrosive (hostile) environment and should be afforded protection of a GFCI. Also, even hardwired motors are removed for storage or repair and may or may not be grounded or bonded to the pool grid upon installation. Are we waiting for a body count?

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 17-75.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 2

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

HIRSCH, B.: See my Comment under Comment 17-75

RAMIREZ, M.: See my explanation of negative vote on Comment 17-75.

Comment on Affirmative:

ROCK, B.: GFCI protection of hard-wired pump motors in the 1999 NEC provides needed safety and these requirements should be reinstated in the 2008 NEC. The fatality cited in US CPSC National Injury Information Clearinghouse data (INDP 990603HCN0217) supports this position.

17-78 Log #2181 NEC-P17 Final Action: Accept (680.22(A)(5))

Submitter: Charles Palmieri, Inspector of Wires Town of Norwell

Comment on Proposal No: 17-91

Recommendation: This Proposal should be reconsidered as Accept in Principle.

Substantiation: Mr. Paul’s substantiation (certainly for northern latitude locations) is valid. GFCI protection of permanently wired pumps is currently not required. Internal failure of such equipment is no less a shock hazard when hard wired then a cord connected installation. Possibility, the CMP regards permanently connected pumps as a stable installation which is not subject to periodic movement and relocation such as a cord connected pump may be. In residential applications pump installations may be best served if only cord connected this is especially true for dwellings where there is a heightened likelihood that the homeowner will provide annual maintenance such as assembly and disassembly of the filtration equipment for winter storage. It is very common that during follow up inspections to notice degraded conditions of the wiring, which supply permanently, connected pool pumps. While such conditions are a cause for alarm to professionals in the electrical industry such concern does not always have the same impact or sense of urgency (to repair) that we who inspect service, and inspect realize. The deteriorated conditions that my fellow inspectors and I have noted regarding permanently connected pump motors are an accident waiting to happen and, frankly, I am puzzled why the language of the 1999 NEC has not been readopted as mentioned by Mr. Curry in Proposal 17-91.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 17-75.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 2

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

HIRSCH, B.: See my Comment under Comment 17-75

RAMIREZ, M.: See my explanation of negative vote on Comment 17-75.

Comment on Affirmative:

ROCK, B.: GFCI protection of hard-wired pump motors in the 1999 NEC provides needed safety and these requirements should be reinstated in the 2008 NEC. The fatality cited in US CPSC National Injury Information Clearinghouse data (INDP 990603HCN0217) supports this position.

17-79 Log #2184 NEC-P17 Final Action: Accept (680.22(A)(5))

Submitter: William F. Laidler, Inspector of Wires Town of Hanover

Comment on Proposal No: 17-91

Recommendation: This Proposal should have been Accepted in Principle. The submitter is correct that by not requiring “hardwired” pool pump motors to be GFCI protected is a hazardous situation.

Substantiation: As an inspector of wires, I am often called to make an inspection at a residence where I had previously done an inspection on a swimming pool. In some cases, I have an opportunity to take a look at the wiring of the existing pool and notice that the liquidlight is usually pulled out of the connector exposing the conductors to the elements of the weather and to the possibility of physical damage. In one particular case, I was called out to investigate why people were getting a sensation of “electrical shock” while in the area of the pool equipment. It was noted that the liquidlight had pulled out of the connector and the ungrounded wire was nicked and making intermittent contact with the metallic frame of the pool pump motor. (hostile) environment and should be afforded protection of a GFCI. Also, even hardwired motors are removed for storage or repair and may or may not be grounded or bonded to the pool grid upon installation. Are we waiting for a body count?

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 17-75.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 2

Ballot Not Returned: 1 Gill, C.

Explanation of Negative:

HIRSCH, B.: See my Comment under Comment 17-75

RAMIREZ, M.: See my explanation of negative vote on Comment 17-75.

Comment on Affirmative:

ROCK, B.: GFCI protection of hard-wired pump motors in the 1999 NEC provides needed safety and these requirements should be reinstated in the 2008 NEC. The fatality cited in US CPSC National Injury Information Clearinghouse data (INDP 990603HCN0217) supports this position.

17-80 Log #1952 NEC-P17 Final Action: Accept (680.22(C))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

Comment on Proposal No: 17-93

Recommendation: Continue to reject the proposal.

Substantiation: The only substantiation for the proposal had to do with the visibility of the requirement. In my code book, 680.22(C) is extremely visible in its bold print with the subsection title prominently displayed. Subsection title fonts are the same as section titles (compare, for example, 680.23 immediately below it.) The proposal is unnecessary.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 17-75.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10

Ballot Not Returned: 1 Gill, C.

17-81 Log #394 NEC-P17 Final Action: Accept (680.22(D))

Submitter: Bryan P. Holland, City of North Port

Comment on Proposal No: 17-96

Recommendation: I continue to support this proposal and the revision made by the Panel.

Substantiation: The 30 volt stipulation in the original proposal was based on the limited shock potential of circuits under 30 volts, however, the panel revision adds an additional level of safety and assured shock prevention from these system types.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 17-75.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10

Ballot Not Returned: 1 Gill, C.

17-82 Log #1798 NEC-P17 Final Action: Reject (680.22(D))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 17-96

Recommendation: This proposal should have been rejected.

Substantiation: The term “outlet” as used in this proposal is only partially correct, and this proposal does not enhance safety for the types of equipment specifically mentioned. “Outlet” is a defined term; “The point on the wiring system at which current is taken to supply utilization equipment.” Thus, for
example, a thermostat or a push-button on a Class 2 circuit is not an outlet and would not be subject to this rule, nor would any junction box. It could be argued that a telephone qualifies as “utilization equipment” as defined and fire alarm “appliances” such as horns or strobes are a form of utilization equipment (which is why they are called fire alarm receptacles). However, devices such as smoke and smoke detectors that are part of a fire alarm system (not residential smoke alarms) are not utilization equipment, so the locations where such devices are installed are not outlets - by definition. Switching devices (including thermostats, push-buttons and fire alarm pull stations) are already covered under (C), luminaires under (B), and receptacles under (A) so “other outlets” in the proposed (D) does not include, in this case, receptacles, lighting outlets, or switching devices. The proposed FPN would then mislead the user to believe that many points on a signaling, fire alarm, remote control, or communications system are actual outlets. Also, although the 10 ft rule works well for equipment that has a standard cord length, telephones commonly have cords longer than 10 ft so the proposal will not eliminate or reduce the hazard it claims to address. The proposal probably won’t hurt much, other than fostering a slew of misinterpretations and creating conflicts with 680.27 where “outlets” are permitted as close as 5 ft or closer for underwater audio, but it won’t resolve much easier.

Panel Meeting Action: Reject
Panel Statement: The panel does not agree with the submitter’s substantiation.
Fire alarm appliances and telephones would be considered as utilization equipment since they use electric energy and connect to outlets that supply them. Refer to the definitions of “outlet” and “utilization equipment” in Article 100.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-83 Log #1450 NEC-P17 Final Action: Reject
(680.23)
Submitter: Donald W. Zipse, Electrical Forensics, LLC
Comment on Proposal No: 17-99
Recommendation: New text:
Underwater Luminaires shall not be NOT be installed in swimming pools, unless the material interfacing with the water is non-conductive.
Substantiation: Electrical safety should be a major concern of this panel. Shocking persons in swimming pools must be stopped and your acceptance of this proposal / comment will be a step in the correct direction and in compliance with NEC 90.1 “Purpose. The purpose of this Code is the practical safeguarding of PERSONS... from the hazards arising from the use of electricity.”
Since the pole mounted or pad mounted or underground utility transformer has the primary neutral connected directly to the secondary neutral which is brought into the service panel, where the combination messenger / neutral / ground conductor is attached to the neutral bus bar. The equipment grounding conductor is connected to the neutral bus bar and is connected to the metal enclosure of the underwater (light fixture) luminaries. The high voltage electric current can and does now flow directly from the primary high voltage utility neutral, through a copper conductor into the swimming pool water from the conductive surface of the luminaries and from the swimming pool water the high voltage current MUST flow through the pool, into the re-bar and into the earth and back to the utility substation completing the high voltage distribution circuit. Electric current flow through the swimming pool subjects the swimmers to electric shocks.
The electric utilities brain trust is called the Electric Power Research Institute, (EPRI) and they admit that 60 percent of the high voltage electric current flows back to the substation over the earth, ground. The utility’s neutral conductor only carries approximately 40 percent of the primary current back on the neutral conductor. (See attached EPRI document.)
The panel replied, “The Code provides for the establishment of an equipotential bonding grid to limit voltage gradients within the pool area.” Tests conducted over the past two years have shown that the pool statement is a figment of the imagination. Anyone familiar with and knowledgeable about OHMS LAW would realize that current flowing through the swimming pool will generate a voltage and that this voltage due to continuous flow of electric current will generate a voltage. This level of voltage has and is continuing to shock persons in swimming pools. See the peer review technical paper presented at an IEEE conference titled: “Equipotential Planes, A Figment of the Imagination”. Although the testing was done on Equipotential Plane found in dairies, it meets the intent of the submitter.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 1
Ballot Not Returned: 1 Gill, C.
Explanation of Negative:
CRIVELL, P.: 1. This proposal addresses a valid concern. There is a real potential for underwater light fixtures to act as part of the return path for unbalanced utility current.
2. Underwater luminaries should be required to be manufactured or installed in such a way as to eliminate the potential for underwater light fixtures to act as part of the return path for unbalanced utility current (e.g., double insulation or isolation through an isolation transformer).

17-84 Log #406 NEC-P17 Final Action: Reject
(680.23(F)(1))
Submitter: Daniel Leaf, Seneca, SC
Comment on Proposal No: 17-104
Recommendation: Revise as follows:
Accept proposal revised:
Branch circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet niche and/or niche luminaires (fixtures) shall be installed using rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, liquidtight flexible metal conduit or rigid nonmetallic conduit, or Type MI cable. Where installed on buildings electrical metallic tubing shall be permitted. For one-family dwellings the provisions of 680.21(A)(4) shall be permitted.
Exception: Where connecting is liquidtight flexible metal conduit liquidtight flexible nonmetallic conduit, or liquidtight flexible metal conduit or liquidtight flexible nonmetallic conduit shall be permitted. Remainder unchanged.
Substantiation: LFMC should be included since 350.10(1) and 350.12(1) permit use where flexibility and protection from liquids or vapors is required and are not subject to physical damage. Panel statement that is subject to physical damage is arbitrary and be judged by the AHJ. Why would LFMC in the same location not automatically be subject to damage? Type MI cable is resistant to physical damage and provides corrosion protection for conductors. Where conditions corrosive to the sheath are present stainless steel or protection (332.12(2)) can be utilized. To automatically conclude the copper sheath will be corroded doesn’t correlate with copper bonding jumpers for rebar and pool equipment which are specified and which may be bare. The reference to 680.21(A) is for correlation as this section doesn’t exempt single-family dwellings.

Panel Meeting Action: Reject
Panel Statement: The use of MI cable is not suitable for pool use; see 332.12. The panel agrees with the submitter that the panel statement on Proposal 17-104 regarding physical damage is incorrect. However, LFMC is not suitable for pool locations due to the corrosive environment.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
Comment on Proposal No: 17-105
Recommendation: Please review.
Substantiation: I don’t understand the Panel comment. The proposal specifically stated that the armored cable would contain an insulated equipment grounding conductor. If the AC cable does not contain an insulated grounding conductor, it can’t be used.
Panel Meeting Action: Accept in Principle
Revise the last sentence of 680.23(F)(1) to read as follows: Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing. Type MC cable, or electrical metallic tubing, or Type AC cable shall be permitted. In all cases an insulated equipment grounding conductor sized in accordance with Table 250.122 but not less than #12 AWG shall be required.
Panel Statement: The revised text more clearly presents the requirements and meets the intent of the submitter.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
Comment on Proposal No: 17-106
Recommendation: Revise existing 680.23(F)(1) as follows:

(F) Branch-Circuit Wiring.

1. Wiring Methods. Branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet-niche and no-niche luminaires (fixtures), and the field wiring compartments of dry-niche luminaires (fixtures), shall be installed using rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, rigid nonmetallic conduit or listed Type MC cable having an impervious outer nonmetallic jacket. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing or electrical metallic tubing shall be permitted.

Exception: Where connecting to transformers for pool lights, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit or listed Type MC cable having an impervious outer nonmetallic jacket shall be permitted. The length shall not exceed 1.8 m (6 ft) for any one length or exceed 3.0 m (10 ft) in total length used. Liquidtight flexible nonmetallic conduit, Type B (LFNC-B), or listed Type MC cable having an impervious outer nonmetallic jacket shall be permitted in lengths longer than 1.8 m (6 ft).

Substantiation: Type MC cable with an impervious nonmetallic outer jacket offers identical protection for these branch circuits as provided by liquidtight flexible metal conduit and should be permitted for use in these applications. The installer should have a choice of installing a proven, safe, listed, cable product or a conduit wiring method.

As Panel member Mr. Blewitt stated in his ballot, “Type MC cable is available with constructions designed to resist the chemical vapors likely in these installations. They are jacketed versions and are marked ‘Suitable for use in swimming pool motor circuits.’” These are safe and proven products and should not be unfairly restricted by the NEC rules.

Panel Meeting Action: Reject
Panel Statement: Type MC cable is not listed for swimming pool luminaires.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-107
Recommendation: Accept proposal revised:

“...shall be grounded connected to the equipment grounding terminal of the panelboard or the metal enclosure of an individual switch or circuit breaker where the circuit originates.”

Substantiation: This requirement should also specifically apply where the branch circuit does not originate from a panelboard.

Panel Meeting Action: Reject
Panel Statement: It is the intent of the panel that the connection be made via a continuous equipment grounding conductor in accordance with 680.23(F)(2) terminating at the equipment grounding terminal of the panelboard.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-112
Submitter: Dan Leaf, Seneca, SC
Recommendation: Accept proposal revised:

“...shall be grounded connected to the equipment grounding terminal of the panelboard or the metal enclosure of an individual switch or circuit breaker where the circuit originates.”

Panel Meeting Action: Reject
Panel Statement: It is the intent of the panel that the connection be made via a continuous equipment grounding conductor in accordance with 680.23(F)(2) terminating at the equipment grounding terminal of the panelboard.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-113
Submitter: Dan Leaf, Seneca, SC
Recommendation: Accept proposal inclusion of liquidtight flexible metal conduit.

Substantiation: The panel statement that liquidtight flexible metal conduit is subject to physical damage is arbitrary and should be determined by the AHJ. LFMC is permitted; why is it not arbitrarily considered subject to physical damage? LFMC is permitted for flexibility and protection from liquids and (non-specifc) vapors. 350.12 does not prohibit use in corrosive environments. 680.42(A)(1) permits LFMC.

Panel Meeting Action: Reject
Panel Statement: The subject conduit is not listed for corrosive environments.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-114
Submitter: Brian Myers, IBEW Local Union 98
Recommendation: Continue to accept in part. Add Exception No. 2 to the positive text to read as follows:

(A) wiring Methods. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building, and electrical nonmetallic tubing shall be permitted where installed within a building. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.

Panel Meeting Action: Accept
Panel Statement: The subject wiring method is not universally listed for pool environments.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-114
Submitter: Phil Simmons, National Armored Cable Manufacturers Assn.
Recommendation: Accept the proposal.

Substantiation: Type MC cable having an impervious nonmetallic sheath is manufactured with a polyvinylchloride outer jacket that makes the cable suitable for direct earth burial, encasement in concrete and is inherently resistant to chlorine-enriched atmospheres. As with all wiring methods in an chlorine-enriched atmosphere, the manufacturer should be consulted to determine the suitability for a particular atmosphere.

Type MC cable of the interlocked metal armor type is manufactured with either a galvanized steel or aluminum armor. For the galvanized steel product, the steel strip is galvanized before being spiraled around the conductors being protected. This galvanizing ensures the satisfactory performance of the cable and is similar, if not identical in protection, to that provided on electrical metallic tubing that is allowed as a wiring method for feeders.

Panel Meeting Action: Reject
Panel Statement: The subject wiring method is not universally listed for pool environments.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-115
Submitter: Phil Simmons, National Armored Cable Manufacturers Assn.
Recommendation: Accept the proposal.

Substantiation: Where connecting to transformers for pool lights, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit or listed Type MC cable having an impervious outer nonmetallic jacket. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing or electrical metallic tubing shall be permitted.

Exception: Where connecting to transformers for pool lights, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit or listed Type MC cable having an impervious outer nonmetallic jacket shall be permitted. The length shall not exceed 1.8 m (6 ft) for any one length or exceed 3.0 m (10 ft) in total length used. Liquidtight flexible nonmetallic conduit, Type B (LFNC-B), or listed Type MC cable having an impervious outer nonmetallic jacket shall be permitted in lengths longer than 1.8 m (6 ft).

Substantiation: Type MC cable with an impervious nonmetallic outer jacket offers identical protection for these branch circuits as provided by liquidtight flexible metal conduit and should be permitted for use in these applications. The installer should have a choice of installing a proven, safe, listed, cable product or a conduit wiring method.

As Panel member Mr. Blewitt stated in his ballot, “Type MC cable is available with constructions designed to resist the chemical vapors likely in these installations. They are jacketed versions and are marked ‘Suitable for use in swimming pool motor circuits.’” These are safe and proven products and should not be unfairly restricted by the NEC rules.

Panel Meeting Action: Reject
Panel Statement: Type MC cable is not listed for swimming pool luminaires.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-116
Submitter: Dan Leaf, Seneca, SC
Recommendation: Accept proposal revised:

“...shall be grounded connected to the equipment grounding terminal of the panelboard or the metal enclosure of an individual switch or circuit breaker where the circuit originates.”

Panel Meeting Action: Reject
Panel Statement: It is the intent of the panel that the connection be made via a continuous equipment grounding conductor in accordance with 680.23(F)(2) terminating at the equipment grounding terminal of the panelboard.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-117
Submitter: Phil Simmons, National Armored Cable Manufacturers Assn.
Recommendation: Accept the proposal.

Substantiation: Type MC cable having an impervious nonmetallic sheath is manufactured with a polyvinylchloride outer jacket that makes the cable suitable for direct earth burial, encasement in concrete and is inherently resistant to chlorine-enriched atmospheres. As with all wiring methods in an chlorine-enriched atmosphere, the manufacturer should be consulted to determine the suitability for a particular atmosphere.

Type MC cable of the interlocked metal armor type is manufactured with either a galvanized steel or aluminum armor. For the galvanized steel product, the steel strip is galvanized before being spiraled around the conductors being protected. This galvanizing ensures the satisfactory performance of the cable and is similar, if not identical in protection, to that provided on electrical metallic tubing that is allowed as a wiring method for feeders.

Panel Meeting Action: Reject
Panel Statement: The subject wiring method is not universally listed for pool environments.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-118
Submitter: Brian Myers, IBEW Local Union 98
Recommendation: Continue to accept in part. Add Exception No. 2 to the positive text to read as follows:

(A) wiring Methods. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building, and electrical nonmetallic tubing shall be permitted where installed within a building. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.

Change existing exception to be Exception No. 1
Add Exception No. 2 as follows:

Exception No. 2 Aluminum conduits shall not be permitted in the pool area where subject to corrosion.

Substantiation: According to the NEC Style Manual sections 3.1.4, 3.1.4.1, and Annex A “Editorial Guidance on Exceptions” “Exceptions should be written into positive language, if positive language achieves clarity.”

Panel Meeting Action: Accept
Panel Statement: The subject wiring method is not universally listed for pool environments.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Comment on Proposal No: 17-119
Submitter: Technical Correlating Committee on National Electrical Code
Recommendation: The Technical Correlating Committee directs that the panel reconsider the proposal and rewrite the text to comply with the NEC Style Manual to correct items such as the mandatory text in Fine Print Notes No. 1 and No. 2, incomplete sentences, and correcting other NEC Style issues. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation of the TCC to reconsider. Refer to the panel action and statement on Comment 17-92.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
Report on Comments A2007 — Copyright, NFPA

17-92 Log #950 NEC-P17  Final Action: Accept in Principle (680.26)

NFPA 70

Submitter: Gary L. Siggens, Underwriters Laboratories Inc.

Comment on Proposal No: 17-114a

Recommendation: Revise as follows:

680.26 Equipotential Bonding.

(A) Performance. The equipotential bonding required by this section shall be installed to reduce voltage gradients in the pool area.

(B) Bonded Parts. The parts specified in 680.26(B)(1) through (B)(7) shall be bonded together using solid copper conductors, insulated covered, or bare, not smaller than 8 AWG or with rigid metal conduit of brass or other identified corrosion-resistant metal. Connections to bonded parts shall be made in accordance with 250.8. An 8 AWG or larger solid copper bonding conductor provided to reduce voltage gradients in the pool area shall not be required to be extended or attached to any remote panelboard, to service equipment, or electrodes. The equipment associated with pool covers, including electric motors shall be bonded. Isolated parts, that are not over 100 mm (4 in.) in any dimension and do not penetrate into the pool structure more than 25 mm (1 in.), shall not be required. Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

1. Be constructed of minimum 8 AWG bare solid copper conductors bonded to each other at all points of crossing. The conductor grid shall be installed in accordance with 680.26(B)(1)(a) and (b).

2. Perimeter Surfaces. The perimeter surface shall extend for 1 m (3 ft) horizontally beyond the inside walls of the pool. This and shall includes unpaved surfaces as well as poured concrete and other types of paving. Bonding to perimeter surfaces shall be provided as specified in 680.26(B)(2)(a) or 680.26(B)(2)(b), and shall be attached to the pool reinforcing steel or copper conductor grid at a minimum of four (4) points uniformly spaced around the perimeter of the pool. For non-conductive pool shells, bonding at four points shall not be required. Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

3. Approved splices shall be permitted. Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

4. Secured within or under the pool no more than 150 mm (6 in.) from the outside contour of the pool shell.

5. Structural Reinforcing Steel. Unencapsulated structural reinforcing steel (rebar) shall be bonded together by steel tie wires or the equivalent.

FPN: For structural reinforcing steel encapsulated in a nonconductive compound, see 680.26(B)(1) (b).

FPN: Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

6. For pool water heaters rated at more than 50 amperes and having specific instructions regarding bonding and grounding, only those parts designated to be bonded shall be bonded and only those parts designated to be grounded shall be grounded.

7. Metal Wiring Methods and Equipment. Metal-sheathed cables and raceways, metal piping, and all fixed metal parts shall be bonded. Copper Conductor Grid. A copper conductor grid shall be installed in accordance with 680.26(B)(1)(b).

Recommendation: Revise as follows:

680.26 Equipotential Bonding.

(A) Performance. The equipotential bonding required by this section shall be installed to reduce voltage gradients in the pool area.

(B) Bonded Parts. The parts specified in 680.26(B)(1) through (B)(7) shall be bonded together using solid copper conductors, insulated covered, or bare, not smaller than 8 AWG or with rigid metal conduit of brass or other identified corrosion-resistant metal. Connections to bonded parts shall be made in accordance with 250.8. An 8 AWG or larger solid copper bonding conductor provided to reduce voltage gradients in the pool area shall not be required to be extended or attached to any remote panelboard, to service equipment, or electrodes. Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

1. Be constructed of minimum 8 AWG bare solid copper conductors bonded to each other at all points of crossing. The conductor grid shall be installed in accordance with 680.26(B)(1)(a) and (b).

2. Perimeter Surfaces. The perimeter surface shall extend for 1 m (3 ft) horizontally beyond the inside walls of the pool. This and shall includes unpaved surfaces as well as poured concrete and other types of paving. Bonding to perimeter surfaces shall be provided as specified in 680.26(B)(2)(a) or 680.26(B)(2)(b), and shall be attached to the pool reinforcing steel or copper conductor grid at a minimum of four (4) points uniformly spaced around the perimeter of the pool. For non-conductive pool shells, bonding at four points shall not be required. Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

3. Approved splices shall be permitted. Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

4. Secured within or under the pool no more than 150 mm (6 in.) from the outside contour of the pool shell.

5. Structural Reinforcing Steel. Unencapsulated structural reinforcing steel (rebar) shall be bonded together by steel tie wires or the equivalent.

FPN: For structural reinforcing steel encapsulated in a nonconductive compound, see 680.26(B)(1) (b).

FPN: Copper Conductor Grid. A copper conductor grid shall be provided and shall comply with the following conditions:

6. For pool water heaters rated at more than 50 amperes and having specific instructions regarding bonding and grounding, only those parts designated to be bonded shall be bonded and only those parts designated to be grounded shall be grounded.

7. Metal Wiring Methods and Equipment. Metal-sheathed cables and raceways, metal piping, and all fixed metal parts shall be bonded. Copper Conductor Grid. A copper conductor grid shall be installed in accordance with 680.26(B)(1)(b).
The required conductor shall be secured within or under the perimeter installed to reduce voltage gradients in the pool area.

(A) Performance. The equipotential bonding required by this section shall be connected to all metal pump motors, metal raceways, metal piping, and all metal parts designated to be bonded and only those parts designated to be bonded shall be bonded. All metal fittings within or attached to the pool structure shall be bonded. Isolated parts that are not over 100 mm (4 in.) in any dimension and do not penetrate into the pool structure more than 25 mm (1 in.) shall not require bonding.

(6) Electrical Equipment. Metal parts of electrical equipment associated with the pool water circulating system, including pump motors and metal parts of equipment associated with pool covers, including electric motors, shall be bonded.

Exception: Metal parts of listed equipment incorporating an approved system of double insulation shall not be bonded.

(a) Double-Insulated Water Pump Motors. Where a double-insulated water-pump motor is installed under the provisions of this rule, a solid 8 AWG copper conductor that is of sufficient length to make a bonding connection to a replacement motor shall be extended from the bonding grid to an accessible point in the vicinity of the pool pump motor. Where there is no connection between the swimming pool bonding grid and the equipment grounding system for the premises, this bonding conductor shall be connected to the equipment grounding conductor of the motor circuit.

(b) Pool Water Heaters. For pool water heaters rated at more than 50 amperes and having specific instructions regarding bonding and grounding, only those parts designated to be bonded shall be bonded and only those parts designated to be grounded shall be grounded.

(7) Metal Wiring Methods and Equipment. Metal-sheathed cables and raceways, metal piping, and all fixed metal parts shall be bonded.

Exception No. 1: Those separated from the pool by a permanent barrier shall not be required to be bonded.

Exception No. 2: Those greater than 1.5 m (5 ft) horizontally of the inside walls of the pool shall not be required to be bonded.

Panel Statement: The revised text more clearly presents the requirements and meets the intent of the submitter. The panel has removed the word “(tear)” from 680.26(B)(1) to clarify that welded wire mesh can be included in the term “structural reinforcing steel” where acceptable to the authority having jurisdiction.

Panel Meeting Action: Accept in Principle
Panel Statement: Refer to the panel action and statement on Comment 17-92.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

Substantiation: See technical paper attached to comment on 17-99 titled: “Equipotential Planes, A Fugitive of the Imagination”

The Code Making Panel is to be commended on taking steps to make swimming pools safer. However, there needs to be MORE accomplished.

The panel statement on Proposal # 17-116 states, “The Code provides for the establishment of an equipotential bonding grid to limit voltage gradients within the pool area. It is not the intent of the equipotential bonding grid to limit voltage gradients to 0 V or to reduce them.”

This gives the pool owner a false sense of security. What if the so-called Equipotential Plane still allows a swimmer to receive electric shock? Should there be a voltage level test? I think NOT. The term Equipotential Plane needs to be eliminated.

Cows have approximately the same internal resistance as humans. Wet skin, hand-to-hand 500 ohms or cow’s feet to mouth the same 500 ohms. We are measuring sufficient electric current to disrupt milk production when cows are standing on an Equipotential Plane that is supposed to reduce the potential. Ha, Ha!

What justification is there for using the so-called term Equipotential Plane? What testing has been done? Mr. Lawrence C. Neubauer and Donald W. Zipse have tested many dairies – same electrical setup as swimming pools – and have found that Equipotential Plane should be eliminated as the Wisconsin dairymen have done – remove Equipotential Planes from the NEC.

You need to re-think the underwater fixtures, luminaries since if they have a conductive frame and thus are required to be connected to the equipment grounding conductor, the isolation of the Equipotential Plane is thus voided.

Substation can be found in the peer reviewed technical paper referenced above.

Substantiation: CRIVELL, P.: Eliminating voltage gradients by bonding is not technically possible. If there is any current flow across the bonding grid or mat, some voltage gradient will exist.

17-95 Log #1668 NEC-P17 Final Action: Reject (680.26, FPN 2)

Submitter: Joseph Mendonca, Rochester, NH

Comment on Proposal No: 17-114a

Recommendation: Revise as follows:

FPN No. 2: Vinyl liners and fiberglass composite shells (which are manufactured with only nonconductive materials) are considered to be nonconductive materials.

Substantiation: fiberglass composite shells can be made of conductive material as well as nonconductive material.

Panel Meeting Action: Reject
Panel Statement: The current manufactured material is not identified as conductive or nonconductive. The submitter has not provided substantiation as to the existence of conductive material used in the manufacture of vinyl liner or composite shell swimming pools.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

17-96 Log #214 NEC-P17 Final Action: Accept (680.26(A))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 17-115a

Recommendation: It was the action of the Technical Correlating Committee that this action be reconsidered and correlated with the action taken on Proposal 17-114a. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction to provide correlation. See panel action on Comment 17-92.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
The proposed solution was tested and worked successfully. Therefore, the proposed solution may not be the only solution, it meets the NEC criteria of providing minimum protection for the public.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

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Comment on Proposal No: 17-100

Recommendation: Delete this Exception:
Exception: The equipotential bonding grid shall not be required to be installed under the bottom of or vertically along the walls of vinyl lined polymer wall, fiberglass composite, or other pools constructed of nonconductive material.

Substantiation: This exclusion for a. A paragraph should state that surfaces can be coated to insulate them and would be similar to double insulated appliances.

Panel Meeting Action: Reject

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Comment on Proposal No: 17-98

Recommendation: Revert Proposal 17-122 should have been adopted in its entirety.

Substantiation: Extensive testing clearly substantiates that the potential for voltage gradient is present in pools where the pool water is not bonded via metal parts in the pool. With this knowledge and confirmation of a voltage gradient hazard, the CMP must address the issue. Test results, handed out at the Proposal Meeting, show that the presence of a touch potential exists in all areas of the pool and that the proposed solution for bonding pool water will essentially reduce that potential to zero. While the proposed solution may not be the only solution, it meets the NEC criteria of providing minimum protection for the public. The test report in its entirety has been submitted to this Comment for further review by the Panel Members.

Typically, pool water is considered electrically conductive due to dissolved chemicals. Although the conductivity will vary with the temperature, the change in conductivity for all practical purposes is not a factor in the application of a proposed solution. Again, the proposed solution meets the NEC criteria of providing minimum protection for the public and should be viewed as an equipotential measure compared to having no protection.

In the proposed solution, the size of bonding conductor is not specified. This is in line with several Bonded Parts described in 680.26(B). In 680.26(B)(1), (B)(2), (B)(3), and (B)(5), use of a minimum of #8 AWG size wire is implied as specified in 680.26(B)(4) and 680.26(C).

In the stray voltage field, ground currents are rarely determined due to measurement difficulties and inaccuracies. On the other hand, resulting voltage gradients (stray voltages), however, are very easy to measure and can be directly used to analyze stray voltage problems and their mitigation.

As evidenced by the test report, the proposed solution is based on such stray voltage measurements around a swimming pool.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 1
Ballot Not Returned: 1 Gill, C.

Explanation of Negative:
CRVELL, P.: Opposite solution is to eliminate stray currents causing the voltage gradient. Code Panel 17 should address the cause and methods for elimination of stray currents. Conductive metallic objects in chlorinated water will result in electrolytic coupling issues.

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Comment on Proposal No: 17-99


Substantiation: Testing done by a National Laboratory (NEETRAC) clearly substantiates that stray current (touch shock hazard) is present in pools where the pool water is not bonded via metal parts in the pool. With this knowledge and confirmation of a potential shock hazard, CMP-17 must address the issue. NEETRAC, in its proposal, recommended a solution for bonding pool water.
The Edison Electric Institute’s (EEI/EL&P) position is that the requirements for end-use electrical devices that are not installed as part of the permanent premises wiring system are best covered by appropriate product standards. It is not the National Electrical Code’s intent to set requirements for end-use electrical devices that would typically be purchased by the after market consumer. EEI/EL&P supports the entire electrical safety system that integrates product standards, installation standards, product testing and evaluation, electrical inspection, manufacturer’s products, qualified electrical installation and maintenance, equipment characteristics, and the owner’s use and operation. Covering product standards in the National Electrical Code installation standard could negate the responsibility of the appropriate product standard and adversely impact the entire process.

The integrity of the electrical safety system is anchored in the systematic integration of the National Electrical Code, installation inspection, product safety standards and product testing. If non-premises end-use product safety issues are usurped by the National Electrical Code, the product safety standard process will be weakened resulting in the entire process being weakened. In addition, since non-premises end-use products are not normally in place during the inspection process, enforcement of such a requirement under the NEC would be impossible.

Panel Meeting Action: Reject
Panel Statement: The panel intends to protect against shock hazards due to damaged cords in this environment. Since this is for a storable pool pump, there is no guarantee that GFCI protection will be available.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 1
Ballot Not Returned: 1 Gill, C.

Hirsch, B.: The EEI/EL&P Companies believe the current Code wording before they got anywhere anyhow. Besides Chlorine is lighter than air. Hot tub or Spa there is not enough room to store chlorine under the skirting large would not come loose. Also in the confines of the area of a self-contained pool pump cords should be covered in the appliance standards and not in the NEC. Panel Meeting Action: Accept In Principle
Recommendation: Accept the proposal as revised:
Where the junction box is supported only by the conduit the conduit shall be permitted to be supported in accordance with 314.23(E) and (F). The conduit shall be of...(remainder unchanged).
Substantiation: The word “conduit” is singular and infers enclosures may be supported by one conduit, and since Chapter 6 may modify Chapters 1 through 4 it is unclear whether the requirements of 314.23(E) and (F) are intended to apply.
Panel Meeting Action: Accept In Principle
Revise 680.52(B)(2)(b) to read as follows:
(b) Underwater enclosures shall be firmly attached to the supports or directly to the fountain surface and bonded as required. Where the junction box is supported only by the conduits in accordance with 314.23(E) and 314.23(F), the conduit shall be of copper, brass, stainless steel, or other approved corrosion-resistant metal. Where the box is fed by nonmetallic conduit, it shall have additional supports and fasteners of copper, brass, or other approved corrosion-resistant material.
FPN: See 314.22 for support of enclosures.
Panel Statement: The revised text more clearly presents the requirement and meets the intent of the submitter. The FPN has been deleted, since the reference in the requirement is more specific.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.

The Edison Electric Institute supports the entire electrical safety system that integrates product standards, installation standards, product testing and evaluation, electrical inspection, manufacturer’s products, qualified electrical installation and maintenance, electric supply system characteristics, and the owner’s use and operation. Covering product standards in the National Electrical Code could negate the responsibility of the appropriate product standard and adversely impact the entire process.

The integrity of the electrical safety system is anchored in the systematic integration of the National Electrical Code, installation inspection, product safety standards and product testing. If non-premises end-use product safety issues are usurped by the National Electrical Code, the product safety standard process will be weakened resulting in the entire process being weakened. In addition, since non-premises end-use products are not normally in place during the inspection process, enforcement of such a requirement under the NEC would be impossible.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original reason for rejection. The submitter’s proposed redirection to 110.14 includes general requirements that are more specific.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10
Ballot Not Returned: 1 Gill, C.
TCC Action: The Technical Correlating Committee understands that the changes made in Comment 17-106 do not alter the changes made by the panel action on Proposal 17-85a with respect to the distance. Submitter: Brian Myers, IBEW Local Union 98

Recommendation: Change 680.71 to read as follows: “shall be permitted to be connected using wiring methods covered in 682.13.” Panel Meeting Action: Accept Final Action: Accept (680.71)

TCC Action: The Technical Correlating Committee understands that the changes made in Comment 17-106 do not alter the changes made by the panel action on Proposal 17-85a with respect to the distance. Submitter: Brian Myers, IBEW Local Union 98

Recommendation: Change 680.71 to read as follows: “shall be permitted to be connected using wiring methods covered in 682.13.” Panel Meeting Action: Accept Final Action: Accept (680.71)

TCC Action: The Technical Correlating Committee understands that the changes made in Comment 17-106 do not alter the changes made by the panel action on Proposal 17-85a with respect to the distance. Submitter: Brian Myers, IBEW Local Union 98

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TCC Action: The Technical Correlating Committee understands that the changes made in Comment 17-106 do not alter the changes made by the panel action on Proposal 17-85a with respect to the distance. Submitter: Brian Myers, IBEW Local Union 98

Recommendation: Change 680.71 to read as follows: “shall be permitted to be connected using wiring methods covered in 682.13.” Panel Meeting Action: Accept Final Action: Accept (680.71)
Substantiation: Since the panel rejected the proposal to specify a switch or circuit breaker, the proposed "or other approved means" will permit other types if acceptable to the AHJ. Simultaneous disconnection of ungrounded conductors should be specified so that no inference is made that such requirements elsewhere in the code are modified in this article. The phrase "shall be permitted" doesn't impose any requirement. It is noted that signs and outline lighting in fountains require a switch or circuit breaker disconnect per 600.6.  

Panel Meeting Action: Accept in Principle  
Revise 682.14(A) to read as follows:  
(A) Type. The disconnecting means shall be permitted to consist of a circuit breaker, switch, or both that simultaneously opens all ungrounded circuit conductors, and shall be properly identified as to which structure or equipment it controls.  

Panel Statement: The revised text more clearly presents the requirements and meets the intent of the submitter.  

Number Eligible to Vote: 11  
Ballot Results: Affirmative: 10  
Ballot Not Returned: 1 Gill, C.  

17-113 Log #538 NEC-P17 Final Action: Accept in Principle (682.14(A))  
Submitter: Dan Leaf, Seneca, SC  
Comment on Proposal No: 17-177  
Recommendation: Accept the proposal as revised.  
The disconnecting means shall be permitted to consist of a circuit breaker(s), switch(es), or both that simultaneously opens all ungrounded circuit conductors and shall be properly identified as to which structure or equipment it controls.  
Substantiation: Since the panel did not want to limit disconnecting means to switches or circuit breakers, other types should be specifically required to be approved. Since Chapter 6 may modify other Code rules for simultaneous disconnection, it should be clearly required in this section.  

Panel Meeting Action: Accept in Principle  
Panel Statement: Refer to the panel action and statement on Comment 17-112.  
Number Eligible to Vote: 11  
Ballot Results: Affirmative: 10  
Ballot Not Returned: 1 Gill, C.  

17-114 Log #1955 NEC-P17 Final Action: Reject (682.30)  
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.  
Comment on Proposal No: 17-178  
Recommendation: Accept the proposal as submitted.  
Substantiation: The proposal wording brings the relevant requirements forward so the reader does not need to query Part III of Article 553, and then 555.15, in order to know the requirements.  

Panel Meeting Action: Reject  
Panel Statement: The NEC Manual of Style does not prohibit the revisions made by the panel action on Proposal 17-178.  
Number Eligible to Vote: 11  
Ballot Results: Affirmative: 10  
Ballot Not Returned: 1 Gill, C.  

ARTICLE 690 — SOLAR PHOTOVOLTAIC SYSTEMS  

13-22 Log #682 NEC-P13 Final Action: Accept (690)  
Submitter: James M. Daly, Upper Saddle River, NJ  
Comment on Proposal No: 13-17  
Recommendation: I agree with the Panel Action except the word "multi-conductor" should be changed to "multiconductor" in 690.35(D).  
Substantiation: This is an editorial correction for consistency. Multiconductor is not hyphenated. In the 2005 NEC, the word "multi-conductor" is only used in Articles 690 and 810 and Annex D. The word "multiconductor" is used in 31 Articles, Chapter 9, and Annex B. In the 2008 preprint, "multi-conductor" only appears 7 times whereas "multiconductor" appears 142 times.  

Panel Meeting Action: Accept  
Number Eligible to Vote: 17  
Ballot Results: Affirmative: 16  
Ballot Not Returned: 1 Gustafson, R.  

13-23 Log #686 NEC-P13 Final Action: Reject (690)  
TCC Action: The Technical Correlating Committee understands that the panel action to Reject this comment also results in the rejection of Proposal 13-17 as stated in the panel statement in this comment.  
Submitter: Timothy M. Croushore, Allegheny Power  
Comment on Proposal No: 13-17  
Recommendation: These recommended corrections to Article 690 as recommended in the original proposal are intended to comply with the current NEC organization as are follows:  
1. Please accept the original proposed modifications to 690.1 Scope as published in the ROP.  
2. Please accept the original proposed modified Figure 690.1(N) as published in the ROP.  
3. Please delete the definition of Interactive System, as it will now appear in Article 100. Please do not delete the definition of Hybrid System and Electrical Power Generation and Distribution Network as proposed. The last two definitions are needed to explain Figure 690.1(B).  
4. Please accept the modifications made in the original proposal to the definitions of Inverter Input Circuit as published in the ROP. The definition of this circuit should apply to Interactive, Hybrid and Stand-alone systems and not just interactive systems. The original definition of Inverter Output Circuit should remain as published in the 2005 NEC.  
5. Please accept the modifications made in the original proposal to 690.3 Other Articles to correspond with the rewrite of Article 705. The proposed modifications are published in the ROP.  
6. Please accept the modifications made in the original proposal to the title of 690.5 DC Ground Fault Protection. Overcurrent Protection. This proposed change is to clarify that the requirement of 690.5 is for DC and not AC Ground Fault protection.  
7. Please delete the complete title and text of (D) Utility-Interactive Inverters Located in Not-Readily-Accessible Locations of 690.13. All Conductors as recommended in the original proposal to correspond with the rewrite of Article 705.  
8. Please delete the complete title and text of 690.54 Interactive System Point of Interconnection as recommended in the original proposal to correspond with the rewrite of Article 705. This information is included in Article 705.  
9. Please do not delete the title and text of (B) Facilities with Utility Service and PV Systems of 690.56 Identification of Power Sources as recommended in the original proposal. These requirements should probably remain in Article 690.  
10. Please delete all of Part VII. Connection to Other Sources and renumbering Part VIII, Storage Batteries accordingly as recommended in the original proposal to correspond with the rewrite of Article 705. The information on connection to other sources is now included in Article 705.  
Substantiation: Code Making Panel 13 is to be commended for the fine job on the work on the rewrite of Article 705 and revision to Article 690 and Article 692 as it appears in the NEC 2008 Draft.  
This comment is a companion comment to the comment on Proposal 13-71 dealing with comment on Article 692. It may be best to review the comment on Article 705, Proposal 13-184 before reviewing this comment and the one on 13-71.  
It is recognized that the Solar Photovoltaic community has done great work in promoting and advancing the utility-interactive inverter technology both for photovoltaic installations. However, this technology can also be used for interconnection for other distributed generation sources. While there may be reluctance to remove the utility-interconnection requirements from Article 690 and 692, it is the best organization for the NEC to keep the nonspecific interconnection requirements in Article 705 scoped specifically for the interconnection of electric power sources and any specific technology installation requirements such as photovoltaic and fuel cells in their separate Articles.  
The main purpose of the original proposal is to consolidate nonphotovoltaic utility interconnection issues with distributed generation in Article 705 and photovoltaic-specific technical issues in Article 690. Having non-photovoltaic utility interconnection issues duplicated within Article 690 causes confusion with Article 705 that is intended to deal with utility interconnection issues with all distributed generation sources.  
The intent of this comment is that the original proposal is to clarify and correct the issues in Article 690 based on the rewrite of Article 705 and on the affirmative comments as published in the Report on Proposals suggested by the members of CMP-13. The original proposal as published in the ROP was used to identify the changes as originally proposed.  
Panel Meeting Action: Reject  
Panel Statement: The panel rejects the proposal in order to satisfy the intent of the original panel action on the proposal by keeping Article 690 intact while transferring selected language related to interconnection to Article 705.  
Number Eligible to Vote: 17  
Ballot Results: Affirmative: 16  
Ballot Not Returned: 1 Gustafson, R.
HORNBERGER, B.: I agree with the panel action, however the panel
Ballot Not Returned:
Ballot Results:
Number Eligible to Vote: 17
Panel Statement:
be rejected by the panel to ensure that the changes indicated in the 2008 NEC
safety for the affected industries that a working group will need to convene
language that will neither omit nor introduce wording that will compromise
13 ROC meeting in November. But, feedback to this point indicates that
Comments have been received and will be reviewed further at the CMP-
Substantiation:
Recommendation:
Comment on Proposal No: 13-17
Proposal 13-184 establishes a location in Article 705 to locate the common interconnection requirements that apply to all electric power production sources operating in parallel with a primary source of electricity. These requirements are not unique to photovoltaic systems and should be relocated to Article 705 and removed from Article 690. This action is a necessary step towards standardization of interconnection requirements and improves the usability of the NEC.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 13-23.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
Comment on Affirmative:
HORNBURGER, B.: I agree with the panel action, however the panel discussed recommending that a Task Group be formed to review the redundant “Point of Connection” requirements for PV in 690, Fuel Cells 692 and Interconnected Electric Power Sources 705. There is no mention of this in the panel statements. The panel harmonized most of these requirements through their actions on comments 13-77, 13-97, and 13-262. Photovoltaic and Fuel Cell systems are “Interconnected Electric Power Sources”, when they operate in parallel with another supply source. Article 705 should apply. Point of connection requirements in Articles 690 and 692 should only contain “special” considerations that pertain to the specific power source technology.
13-25 Log #1704 NEC-P13
(690)
Final Action: Accept
TCC Action: The Technical Correlating Committee understands that the panel action to Accept this comment also results in the rejection of Proposal 13-17.
Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-17
Recommendation: The PV Industry Forum agrees with the Panel Action to reject the proposal as it applies to Articles 690 and also agrees with the Comments by Bower, Kranstins, and Zgonena.
Substantiation: Neither the PV Industry, the electrical installer industry, the inspector community, nor the user community have had time to fully digest and analyze the impacts of this far-reaching proposal. A working group drawn from these groups should be convened to prepare a complete proposal for the 2011 code cycle.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 13-23.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
13-26 Log #2198 NEC-P13
(690)
Final Action: Reject
TCC Action: The Technical Correlating Committee understands that the panel action to Reject this comment also results in the rejection of Proposal 13-17 as stated in the panel statement in this comment.
Comment on Proposal No: 13-17
Recommendation: Reject the proposed change.
Substantiation: The panel acknowledged the value of such a proposal and accepted this proposal in principle to permit public comment of the proposal. Comments have been received and will be reviewed further at the CMP-13 ROC meeting in November. But, feedback to this point indicates that to adequately address the concerns of a change of this magnitude and craft language that will neither omit nor introduce wording that will compromise safety for the affected industries that a working group will need to convene to provide a comprehensive proposal for the 2011 NEC. The proposal should be rejected by the panel to ensure that the changes indicated in the 2008 NEC ROP are not inadvertently included in the final publication.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 13-23.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
Substantiation:
Recommendation:
Comment on Proposal No: 13-18
Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-22
Comment on Proposal No: 13-22
Recommendation: The Technical Correlating Committee understands that in the panel Statement, Proposal 13-22 was not held. The PV Industry Forum agrees with the Panel Action to reject the proposed change. The PV Industry Forum understands that in the panel statement, Proposal 13-22 was not held. The PV Industry Forum agrees with the Panel Action to reject the proposed change.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 13-23.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
Comment on Affirmative:
John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Proposal 13-17.
The panel acknowledged the value of such a proposal and
improves the usability of the NEC.
13-18
Final Action: Hold
(690.5)
TCC Action: The Technical Correlating Committee understands that in the panel statement, Proposal 13-22 was not held.
Comment on Proposal No: 13-22
Recommendation: The Technical Correlating Committee understands that in the panel statement, Proposal 13-22 was not held. The PV Industry Forum agrees with the Panel Action to reject the proposed change. The PV Industry Forum understands that in the panel statement, Proposal 13-22 was not held. The PV Industry Forum agrees with the Panel Action to reject the proposed change.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 13-23.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
Comment on Affirmative:
John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Proposal 13-17.
The panel acknowledged the value of such a proposal and
improves the usability of the NEC.
13-18
Final Action: Hold
(690.5)
13-29 Log #287 NEC-P13  
**Final Action: Accept (690.5 Exception No. 2, 690.45)**  

**TCC Action:** The Technical Correlating Committee understands that the portion of the comment recommendation on 690.45 is a comment on Proposal 13-49.  

**Submitter:** Code-Making Panel 5, Community College of Denver  
**Comment on Proposal No:** 13-22  
**Recommendation:** CMP-5 recommends revising Exception No. 2 to reference 690.45 for equipment grounding conductor sizing requirements.  

Revise Exception No. 2 to 690.5 as follows:  

"Exception No. 2: PV arrays installed at other than dwelling units shall be permitted to be constructed with ground-fault protection where the equipment grounding conductors are sized in accordance with 690.45."

Revise 690.45 into a list format as follows:  

"690.45 Size of Equipment-Grounding Conductor. Equipment grounding conductors for photovoltaic sources and photovoltaic output circuits shall be sized in accordance with (A) or (B).  

(A) Equipment-grounding conductors in photovoltaic source and photovoltaic output circuits shall be sized in accordance with Table 250.122. When no overcurrent protective device is used in the circuit, an assumed overcurrent device rated at the photovoltaic rated short-circuit current shall be used in Table 250.122. Increases in equipment-grounding conductor size to address voltage drop considerations shall not be required, if equipment grounding conductors sized per 690.5(A) Exception 2 are used, the above sizing requirements are not to be used. The equipment-grounding conductors shall be no smaller than 14 AWG.  

(B) For other than dwelling units where ground-fault protection is not provided in accordance with 690.5(A) through (C), each equipment grounding conductor shall have an ampacity of at least two (2) times the temperature and conduit fill corrected circuit conductor ampacity."

Add a new FPN following the revision to this section (B) as follows:  

"FPN: The short circuit current of photovoltaic modules and photovoltaic systems is just slightly above the full load normal output rating. In ground fault conditions, these sources are not able to supply the high levels of short-circuit or ground-fault currents necessary to quickly activate overcurrent devices, as in typical AC systems. Protection for equipment grounding conductors in photovoltaic systems that are not provided with ground-fault protection is related to size and withstand capability of the equipment grounding conductor, rather than overcurrent device operation."

**Substantiation:** 690.45 already provides the minimum sizing requirements for equipment grounding conductors. From an NEC usability standpoint, all such sizing requirements should be provided in this section. The proposed Exception No. 2 to 690.45 as adjusted, would provide the necessary correlation with 690.45 that would now include under this revision a sizing requirement that is in excess of current EGC sizing requirements contained in 690.45 and 250.122 for specific reasons related to the performance of this special equipment.  

The proposed revisions to 690.45 are also needed for proper alignment with 690.5.  

Substantiation provided indicated that the amount of short-circuit current produced from solar photovoltaic equipment is slightly higher than the normal output current levels. In ground fault conditions, solar photovoltaic equipment is not able to supply the high levels of short-circuit or ground-fault currents necessary to quickly activate overcurrent devices as in typical AC systems. Protection for equipment grounding conductors in photovoltaic systems that are not provided with ground-fault protection is related to size and withstand capability of the equipment grounding conductor, rather than overcurrent device operation. This information is provided in a new FPN following the new equipment grounding conductor sizing provisions. The FPN will provide useful information for users describing the unique conditions that warrant increased equipment grounding conductor sizes where ground-fault protection is not provided.  

This comment has been balloted through CMP-5 with the following ballot results:  

15 Eligible to Vote  
13 Affirmative  
1 Negative  
1 Not Returned (W. Helfrich)

Mr. D. Mohla voted negatively stating: “Comment on these proposals should be separated as they pertain to different sections of the code and proposals. I agree with the revised Exception No. 2 proposed by CMP-5 which refers equipment grounding conductor sizes to 690.45, where sizing belongs. I do not agree with all the revisions to 690.45 proposed by CMP-5.  

There is no basis or justification for inclusion of 690.45(B) or a FPN requiring an exception from ground fault protection when equipment grounding conductor size is twice the phase conductors. Please see the objection of the Technical Correlating Committee on Proposal 13-22 (690.5) which reinforced basic requirements contained in 250.122 that EGC sizing is based on overcurrent corrective devices.  

See the negative vote by Mr. Swayne on Proposal 13-22.”

**Panel Meeting Action:** Accept  
**Number Eligible to Vote:** 17  
**Ballot Results:** Affirmative: 16  
**Ballot Not Returned:** 1 Gustafson, R.

13-30 Log #1707 NEC-P13  
**Final Action: Accept (690.5(A))**

**Submitter:** John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum  
**Comment on Proposal No:** 13-23  
**Recommendation:** The original proposal should be accepted as submitted. The warning is already required by 690.5(C). Here is the original submission:  

690.5(A) Ground-Fault Detection and Interruption. The ground-fault protection device or system shall be capable of detecting a ground-fault current, interrupting the flow of fault current, and providing an indication of the fault.  

Automatically opening the ground-fault protection device to interrupt the ground-fault current path shall be permitted. If a grounded conductor is opened to interrupt the ground-fault current path, all conductors of the faulted source circuit shall be automatically and simultaneously opened.  

**Substantiation:** The Panel Actions and wording have created a conflict with UL Standard 1741 requirements and created a safety hazard as pointed out by Zgonena. The necessary safety warning is already required by 690.5(C). The original submission should be adopted.

**Panel Meeting Action:** Accept  
**Number Eligible to Vote:** 17  
**Ballot Results:** Affirmative: 16  
**Ballot Not Returned:** 1 Gustafson, R.

13-31 Log #1709 NEC-P13  
**Final Action: Accept (690.7(A))**

**Submitter:** John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum  
**Comment on Proposal No:** 13-27  
**Recommendation:** The PV Industry Forum agrees with and supports the Panel Action.

**Substantiation:** For Swanye: None of the basic PV module data is in the code. It is found on the module labels. Much of the information required to size the ac circuits connected to an inverter is found only in the inverter instruction manuals, not in the code. Inspectors throughout the country are starting to require all necessary information and calculations for code compliance on PV systems to be furnished with the permit applications. Also note that new PV module technologies such as thin films (three currently and more coming) will require that manufacturer’s instructions be used to make code-required calculations. These technologies are addressed in the requirement, already in this section, to use the manufacturer’s data.

**Panel Meeting Action:** Accept  
**Number Eligible to Vote:** 17  
**Ballot Results:** Affirmative: 16  
**Ballot Not Returned:** 1 Gustafson, R.

13-32 Log #1967 NEC-P13  
**Final Action: Reject (690.7(A))**

**Submitter:** Elliot Rappaport, Electro Technology Consultants  
**Comment on Proposal No:** 13-27  
**Recommendation:** Reject the proposal.

**Substantiation:** The proposed wording does not provide information to all who may have a need for it. The AHJ does not have access to instructions and must rely on code. If a module is replaced with one having a different coefficient, the maximum circuit voltage may change.

**Panel Meeting Action:** Reject  
**Panel Statement:** The NEC recognizes labeling instructions as an enforceable Code requirement.  
**Number Eligible to Vote:** 17  
**Ballot Results:** Affirmative: 16  
**Ballot Not Returned:** 1 Gustafson, R.
13-34 Log #1711 NEC-P13 Final Action: Accept in Principle
(690.8(A)(1))

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-28

Recommendation: The PV Industry Forum agrees with and supports the Panel Action.

Substantiation: For Swanye:

Two multiplication factors of 1.25 (125%) are required on the module short-circuit current. The first 690.8(A)(1) deals with the fact that the module short circuit current may exceed the rated value (marked on the back of the PV module) for a period of three hours or more on clear sunny days. The second 125% required by 690.8(B)(1) is required to ensure that this higher current (the value from 690.8(A)(1)) does not result in conductors or overcurrent devices operating at more than 80% of rating.

Panel Meeting Action: Accept in Principle

Add a new FPN following 690.8(A) to read as follows:

FPN: Where the requirements of 690.8(A)(1) and 690.8(B)(1) are both applied, the resulting multiplication factor is 156 percent.

Panel Statement: The double-derating requirement is now clarified and addresses the affirmative comment expressed in the voting.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-33 Log #327 NEC-P13 Final Action: Reject
(690.10(A))

Submitter: Albert Parry, City of Aspen/Pitkin County

Comment on Proposal No: 13-29

Recommendation: Leave section as originally written.

Substantiation: The code change proposer is stating that the pv alternate stand alone system should not be subject to the requirements of the code as to load capability.

When the system is used in a residential application it should be capable of powering all life safety systems concurrently and the largest piece of equipment as a minimum.

His change would treat off grid 5,000’ duplex dwellings the same as a 200’ cabin.

There is no sense in allowing the installation of a 13KW double oven on a 7KW system.

Panel Meeting Action: Reject

Panel Statement: The original proposal and the panel action produced identical language except for removal of “that may be.” The proposal is to allow the original. The removal of “that may be” removes the future reference. This is not a life-safety issue.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-35 Log #1968 NEC-P13 Final Action: Accept
(690.10(A))

Submitter: Elliot Rappaport, Electro Technology Consultants

Comment on Proposal No: 13-29

Recommendation: Delete “service” in the first sentence.

Substantiation: Not all buildings or structures are supplied by a “service” as defined in this code, but will have a disconnecting means.

Panel Meeting Action: Accept

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-36 Log #87 NEC-P13 Final Action: Accept
(690.13)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 13-32

Recommendation: The Technical Correlating Committee understands that the Panel Action on Proposal 13-31a modifies the Panel Action on this Proposal. The Technical Correlating Committee directs the panel to reconsider the use of the term “may” to be consistent with the NEC Style Manual. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Delete the first “may” and change the second “may” to “shall be permitted to.” The text now reads: “…if operation of that switch, circuit breaker, or other device may leave the marked, grounded conductor in an ungrounded and energized state.

Exception: A switch or circuit breaker that is part of a ground-fault detection system required by 690.5 may be permitted to open the grounded conductor when that switch or circuit breaker is automatically opened and indicated only as a normal function of the device in responding to ground faults.”

Panel Statement: This action is now consistent with the NEC Style Manual.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 17

Ballot Not Returned: 1 Gustafson, R.

13-37 Log #1712 NEC-P13 Final Action: Accept
(690.13)

TCC Action: The Technical Correlating Committee understands that the comment addresses a Code-Making Panel 13 proposal, not a Technical Correlating Committee proposal.

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-31a

Recommendation: The PV Industry Forum proposes that this TCC proposal be rejected in favor of an acceptance of 13-32 (Log #2087).

Substantiation: All current-carrying conductors in a system should have disconnects or it would not be possible to connect or disconnect equipment for additions, repairs, or replacements. Disconnects can be bolted connections or terminals and do not necessarily have to be switches or circuit breakers.

User-accessible switched disconnects should not be placed in grounded source circuit conductors.

Panel Meeting Action: Accept

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-38 Log #1714 NEC-P13 Final Action: Hold
(690.13)

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-32

Recommendation: The PV Industry Forum agrees with and supports the Panel Action without the change suggested by the TCC in 13-31a Log CP 1301. An additional Exception #2 is proposed as follows: Exception 2: A disconnecting switch shall be permitted in a grounded conductor if it is: a. used only for PV array maintenance, and b. accessible only by qualified persons.

Substantiation: The location and correction of ground faults in PV arrays may require that the ungrounded conductor be disconnected from the system and fed ground during maintenance operations. This permissive allowance provides that a maintenance-only switch can be added to the system to facilitate such operations.

Panel Meeting Action: Hold

Panel Statement: The commenter has met the intent of Comment 13-37 with this change, but the material is new. The TCC request has been addressed in the panel action of Comment 13-36. This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals. Only the comment is being held.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-39 Log #1716 NEC-P13 Final Action: Reject
(690.13)

TCC Action: The Technical Correlating Committee understands the rejection of this comment is based on the substantiation in Comment 13-41 since rejection based on the acceptance of Comment 13-41 is a violation of Section 4.4.6.3 of the NFPA Regulations Governing Committee Projects.

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-33

Recommendation: The PV Industry Forum agrees with and supports the Panel Action.

Substantiation: None given.

Panel Meeting Action: Reject

Panel Statement: See panel action on Comment 13-41.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.
Proposal from the TCC be rejected. The original language is correct.

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Recommendation: Accept the proposal in principle by using the text from the comment on affirmative vote: Add at the end, "The switch or circuit breaker shall indicate the presence of a ground-fault."

Substantiation: The submitter appreciates the panel statement because he was unaware the sentence was intended to be so applied. This comment implements the affirmative comment in the voting.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 13-41.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

Final Action: Accept (690.13)

TCC Action: The Technical Correlating Committee understands that the panel action to “Hold” Comment 13-44 only applies to the Comment and not the Proposal.
Submitter: Robert H. Wills, Intergrid, LLC
Comment on Proposal No: 13-31a
Recommendation: As the submitter of panel actions 13-31a and 13-35a, I request that CMP-13 Reject both actions as they now stand, and also consider modifying 690.13 as follows:
690.13 All Conductors. Means shall be provided to disconnect all current-carrying conductors of a photovoltaic power source from all other conductors in a building or other structure. A switch or circuit breaker shall not be installed in a grounded conductor unless:
1. the switch or circuit breaker is part of a ground-fault detection system required by 690.5 and that the switch or circuit breaker is automatically opened and indicated as a normal function of the device in responding to ground faults, or,
2. (an optional switch or circuit breaker is provided in a grounded conductor for maintenance and troubleshooting, and only operable by qualified personnel.

FPN: The grounded conductor may have a bolted or terminal disconnecting means to allow maintenance or troubleshooting by qualified personnel.

Substantiation: I brought up the inconsistency in 690.13 and 690.14(C) that requires means for disconnecting all current-carrying conductors, then go on to say that grounded conductors should not be disconnected.

This resulted in panel actions 13-31a and 13-35a.
Further research has shown that the inconsistency stems from the addition of the second sentence of 690.13 in the 1990s when GFI language was added.
The Fine Print Note: “The grounded conductor may have a bolted or terminal disconnecting means to allow maintenance of troubleshooting by qualified personnel.” was added at the same time.
The original version of Article 690 was written for the 1984 code cycle. One of the authors, Tom Key of Sandia Labs (now at EPRIEAC) wrote in a paper included in the 1985 IEEE PV Specialists Conference Proceedings (“Grounding Considerations for Non-Isolated Photovoltaic Systems”). Another frequently overlooked requirement is 690.13 which states that “means shall be provided to disconnect all current carrying conductors”. This applies to the “grounded” conductor of the PV array whether it be the neutral or negative lead. The disconnecting means, if properly rated, can provide a very effective way to extinguish a line-to-ground fault in the array.
The paper’s Figure 2 showed a pole disconnect opening both current-carrying conductors to the array, with the ground bond being on the inverter side of the switch.

Photovoltaic arrays typically contain many photovoltaic modules and interconnection wiring that can be subject to ground faults.

The requirement has changed over the years form opening all current-carrying conductors to ground fault interruption (which typically opens the grounded conductor) plus a FPN provision for bolted or terminal disconnect.

It is reasonable to consider the GFI equipment as now fulfilling the requirement that grounded conductors be disconnected (if there is a ground fault).
The FPN provision is, however, not a safe or sufficient substitute for a switched disconnect in large-scale photovoltaic systems. If multiple ground faults were to occur on different strings, the grounded conductors of the faulted strings would have to be disconnected in order to find the fault locations.

In doing so, the service person would have to open a bolted connection under load - a potentially hazardous activity.

An optional switched disconnect or circuit breaker in grounded conductors for service use only, and only operable by qualified personnel, satisfies the original intent of this section of the code and allows for the removal of a service hazard in large-scale systems.

Panel Meeting Action: Hold
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
The PV Industry Forum supports returning the allowance for metallic cable assemblies as originally submitted.

Substantiation: Type MC cable assemblies have used permitted and not permitted that are less restrictive than those applied to the allowed Type FMC flexible metal conduit (metallic raceway). All the positive benefits of metallic raceways needed for PV source and output circuits are found in metallic cable assemblies that are currently permitted.
assemblies. Each type of roadway has differing installation requirements and limitations, which must be followed. And any roadway used in a particular installation will have to be suited to the environmental factors. Grounding is not an issue since an equipment-grounding conductor is usually used in these circuits and the available ground-fault currents are rarely more than the circuit currents and in systems with ground-fault protection will be limited to 10 amps or less.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-47.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 15 Negative: 1
Explanation of Negative: BOWER, W.: See My Explanation of Negative on 13-47.

13-49 Log #1724 NEC-P13 Final Action: Accept (690.31(F))
Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-40
Recommendation: The PV Industry agrees with and supports the Panel Action.
Substantiation: With respect to the comment by Nasby: The use of fine-stranded, flexible cables is not required in any commonly used PV system where normal NEC-compliant, listed electrical equipment is used. When such cables have been used, they have been improperly terminated because the requirement for proper termination is buried deep in a narrowly-distributed UL Standard. The proper ferrules and crimping tools, while readily available from multiple sources in Europe, are not commonly or readily available in the U.S. Neither the typical electrical supply house nor big-box building centers carry them or the required crimping tools.
Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-50 Log #1725 NEC-P13 Final Action: Accept (690.33)
Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-42
Recommendation: The PV Industry Forum agrees with and supports the Panel Action. The "c C" typo in the first line should be corrected.
Substantiation: None given.
Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-51 Log #2505 NEC-P13 Final Action: Accept in Principle (690.33(C))
Submitter: Robert H. Wills, Intergrid, LLC
Comment on Proposal No: 13-41
Recommendation: The language proposed for 690.33(C) could be improved:
Existing Proposal:
Connectors that are readily accessible in circuits operating at over 50 volts nominal system voltage for dc circuits or nominal voltage for ac circuits shall require a tool to open.
Revised language:
Connectors that are readily accessible and that are used in circuits operating at over 50 volts nominal maximum system voltage for dc circuits, or 50 volts for ac circuits shall require a tool for opening.
Substantiation: Revised language is clearer and more readable.
Panel Meeting Action: Accept in Principle
Change 50 volts to 30 volts in both places.
Panel Statement: The action is in accordance with the original panel action on Proposal 13-41.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-52 Log #2130 NEC-P13 Final Action: Accept in Principle (690.35(C))
TCC Action: The Technical Correlating Committee understands that the panel action on the comment modifies the panel action on Comment 13-69.
Submitter: Robert H. Wills, Intergrid, LLC
Comment on Proposal No: 13-53
Recommendation: Change the proposed text for 690.47(D) as follows:
690.47(D) Grounding Additional Electrodes for Array Grounding. Grounding electrodes for equipment grounding shall be installed in accordance with 250.52 at the location of all ground and pole-mounted photovoltaic arrays and shall be as close as possible to the location of roof-mounted photovoltaic arrays. The electrodes shall be connected directly to the array frame(s) or the main grounding electrode conductor if it meets the requirements of 250.52. Additional electrodes are not permitted to be used as a substitute for equipment bonding or equipment grounding electrode conductor requirements. The structure of a ground or pole-mounted photovoltaic array can be considered a grounding electrode if it meets the requirements of 250.52. Additional electrodes are not an issue since an equipment-grounding conductor is usually used in these circuits and the available ground-fault currents are rarely more than the circuit currents and in systems with ground-fault protection will be limited to 10 amps or less.

Panel Meeting Action: Accept in Principle
Change the text for 690.47(D) to:
690.47(D) Grounding Additional Electrodes for Array Grounding. Grounding electrodes for equipment grounding shall be installed in accordance with 250.52 at the location of all ground and pole-mounted photovoltaic arrays and shall be as close as possible to the location of roof-mounted photovoltaic arrays. Additional electrodes are not permitted to be used as a substitute for equipment bonding or equipment grounding conductor requirements. The structure of a ground or pole-mounted photovoltaic array can be considered a grounding electrode if it meets the requirements of 250.52. Additional electrodes are not an issue since an equipment-grounding conductor is usually used in these circuits and the available ground-fault currents are rarely more than the circuit currents and in systems with ground-fault protection will be limited to 10 amps or less.

Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
13-54 Log #683 NEC-P13 Final Action: Accept in Principle (690.35(D))

TCC Action: The Technical Correlating Committee understands the panel action Accepts the text in Comment 13-54. The panel action on Comment 13-55 to delete the words “and output” modifies the panel action on this comment.
Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 13-44
Recommendation: The Proposal should have been Accepted in Principle in Part. I agree with the part the Panel did not Accept.

The remainder of the Proposal should have been Accepted in Principle by revising the section to read as follows: “The photovoltaic source and output conductors shall consist of:

1. Sheathed (jacketed) multi-conductor nonmetallic jacketed multicore cables
2. Conductors installed in raceways, or
3. Conductors listed and identified as Photovoltaic (PV) Wire installed as exposed, single conductor single-conductor cable.”

Substantiation: The change to multicore is an editorial correction for consistency. Multicore conductor is not hyphenated. In the 2005 NEC, the word “multi-conductor” is only used in Articles 690 and 810 and Annex D. The word “multiconductor” is used in 31 Articles, Chapter 9, and Annex B. In the 2008 preprint, “multi-conductor” only appears 7 times whereas “multiconductor” appears 142 times.

The word “sheathed” is normally associated with a metallic sheath whereas a jacket implies a nonmetallic covering over the assembly. A single conductor is not normally considered a cable. A cable, except for MC and MI cables which have additional layers over the insulated conductor, normally consists of two or more single conductors underground a common overall metallic sheath or nonmetallic jacket.

Panel Meeting Action: Accept in Principle
Panel Statement: The term “and output” is removed because the requirement for output conductors does not apply. Also see Comment 13-55. This is in accordance with W. Bower’s affirmative comment to Proposal 13-44.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-55 Log #1730 NEC-P13 Final Action: Accept in Principle (690.35(D))

TCC Action: The Technical Correlating Committee understands that the panel action to delete the words “and output” modifies Comment 13-54.
Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-44
Recommendation: The original submittal is resubmitted:

690.35(D) The photovoltaic source and output conductors shall consist of:
(1) Sheathed (jacketed) multi-conductor cables, (2) Conductors installed in raceways, or (3) Conductors listed and identified as Photovoltaic (PV) Wire installed as exposed, single-conductor cable.

Substantiation: The proposal was correct as stated. The intent is to provide additional safety in the PV source-circuit wiring on ungrounded PV systems between modules and between the modules and any combining points located in the PV array. These circuits can operate up to 600 volts with exposed, single-conductor wiring in grounded PV systems. PV output circuits (in wording retained by the Panel Action) are typically already made using one of the code-approved wiring methods in Chapter 3, which do not include exposed, single conductor wiring. See accepted wording for 690.35(B)(3) (13-38 Log 2070). This proposal parallels the accepted wording and should be restricted to PV source circuits. The words “and output” should be deleted.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 13-54.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-56 Log #1731 NEC-P13 Final Action: Accept in Principle (690.42 Exception)

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-46
Recommendation: The proposal is resubmitted with a slight revision to increase clarity.

690.42 Point of System Grounding Connection.

Exception: Systems with a 690.5 ground-fault protection device usually have the required grounded conductor-to-ground bond made by the ground-fault protection device. This bond, if internal to the ground-fault equipment, shall not be duplicated with an external connection.

Substantiation: Section 690.5 ground-fault protection devices typically have a grounded conductor-to-ground bond. The revised text addresses the TCC Direction concerning the use of the word “may” (it has been eliminated for clarification) and follows the Panel Action or eliminating any unnecessary words. The exact bonding connection has also been clarified. Although using the grounded conductor-to-ground bond in the ground-fault device is the most common method, the code does allow other methods to be used, so the words “usually” and “if” are required to address the very rare unconventional system that does not use the bond in the ground-fault protection.

Panel Meeting Action: Accept in Principle
Change the word “usually” to “shall be permitted to.” Change “if” to “where.” The revised text will read as follows:

Exception: Systems with a 690.5 ground-fault protection device shall be permitted to have the required grounded conductor-to-conductor bond made by the ground-fault protection device. This bond, where internal to the ground-fault equipment, shall not be duplicated with an external connection.

Panel Statement: The changes were made to comply with the NEC Style Manual.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

Comment on Affirmative:
Comment on Negative: The original proposal should have been rejected because the existing text already requires only one point for grounding. Addition of wording, such as, “The single point shall be permitted to be internal to a ground fault protection device,” in the main text would be sufficient. I am voting affirmative because the proposed text is better than the original proposal.

STAFFORD, T.: My panel notes indicate that the wording in the exception as published in the ROC does not correspond with what happened at the meeting. The text should read:

Exception: Systems with 690.5 ground-fault protection device shall be permitted to have the required grounded conductor-to-ground bond made by the ground-fault protection device. This bond, where internal to the ground-fault equipment, shall not be duplicated with an external connection.

In the published ROC it says grounded conductor-to-conductor bond...I think that this is an editorial change that has been overlooked.

13-57 Log #88 NEC-P13 Final Action: Accept (690.43)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-47
Recommendation: The Technical Correlating Committee directs that the panel reconsider the Action on this Proposal to comply with the NEC Style Manual by changing “are permitted” to “shall be permitted” in both sentences of the new second paragraph and changing the proposed text from “when required” to “where installed” in the second paragraph of the Proposal which becomes the new third paragraph in the section.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-58 Log #89 NEC-P13 Final Action: Accept (690.43)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-48
Recommendation: It was the action of the Technical Correlating Committee that the panel reconsider the Panel Action and correct the wording by replacing “is required” with “shall be required” to comply with the NEC Style Manual. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-59 Log #1732 NEC-P13 Final Action: Accept in Principle (690.43)

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Comment on Proposal No: 13-47
Recommendation: The text of the proposal is revised per TCC direction:

Devices listed and identified for grounding the metallic frames of PV modules shall be permitted to ground the exposed metallic frames of PV modules to grounded mounting structures. Devices identified and listed for bonding the metallic frames of PV modules shall be permitted to bond the exposed metallic frames of PV modules to the metallic frames of adjacent PV modules.
for clarity. The 125% of the short-circuit current is not needed, short-circuit current alone will suffice.

Panel Meeting Action: Accept in Principle

Recommendation: I believe that this proposal should be considerably modified due to the following reasons: 1. The resulting language does not address any of the items that the original proposal 13-50 Log 2585 addressed and clarified. There is no clarification as to when a system will require dc grounding requirements. There is no clarification that utility-interactive systems will have the ac grounding system provided by the existing ac premises grounding system. 2. There is no definition of what “bonding conductor” is being referred to in (2). The text appears to be saying that all equipment-grounding conductors in both the dc and ac systems shall be sized as the larger requirement (ac or dc). On a large system, the ac equipment-grounding conductors between the modules on the same premises grounding system. 3. There is no definition of what “bonding conductor” is being referred to in (2). The text appears to be saying that all equipment-grounding conductors in both the dc and ac systems shall be sized as the larger requirement (ac or dc). On a large system, the ac equipment-grounding conductors may be 2-4 AWG as determined by 250.122 where as the dc equipment—grounding conductors between the modules on the same system may be a small as 14 AWG from 690.45. It would be nearly impossible to attach 2-4 AWG equipment-grounding conductors to modules and the cost would be prohibitive. 3. Currently available inverters with Ground-Fault Protection circuits make the bond between the grounded conductor and the grounding system internally. With transformer isolation, between the dc grounded conductor and the ac grounded conductor, the de system must have
a dc grounding electrode conductor that meets minimum code requirements (typically depending on the type of grounding electrode) for such a conductor. Using equipment-grounding conductors that may have numerous splices and may be smaller and subject to higher current density than the ac grounding electrode conductor does not meet these minimum requirements. 4. Aside from current panel actions on 13-53, the adoption of this proposal would endorse grounding PV array frames on small (1-3 kW) residential systems by a conductor as small as 14 AWG routed from the roof, through the dc disconnect, the inverter, the ac disconnect, the ac house panel, and finally to the ac grounding electrode. This path is neither direct, nor free of splices that could deteriorate over time, nor is the small conductor size related to a low-impedance surge path to ground. These systems will be producing hazardous amounts of voltage and current for 40-50 years or more and proper and very reliable grounding will be the last line of defense against fires and shock hazards.

Substantiation: None given.

Panel Meeting Action: Reject

Panel Statement: The submitter does not provide an action to the NEC text or any substantiation.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R

13-66 Log #129 NEC-P13 Final Action: Accept in Principle (690.47(C))

TCC Action: The Technical Correlating Committee understands that the panel action on Comment 13-66 to Accept in Principle included the word “overcurrent” in 690.47(C)(4) as included in the comment and in the panel action on Proposal 13-51.

The Technical Correlating Committee also understands that the addition of the phrase “and the system bonding requirements of 250.28.” in 690.13-66(C)(4) also replaces the comma with “or” before the “ac requirements…” and deleting the comma after “(…250.122)”. The Technical Correlating Committee has corrected the text in (2) and (3) in the panel action text in the proposal to comply with the NEC Style Manual as follows:

“(2) A bonding conductor between these systems shall be sized as the larger of the dc requirement in accordance with 690.45, (according to 690.45) and the ac requirements, based on the inverter alternating current overcurrent device rating and 250.122, and the system bonding requirements of 250.28.

(3) A conductor that serves as both an equipment grounding conductor and as part of the bond between ac and dc systems for an inverter incorporating dc ground-fault protection shall meet the requirements of equipment grounding bond jumpers in accordance with 250.102 (250.102) but shall not be subject to the requirements for bonding jumpers in accordance with 250.28 (250.28).

Submitter: Robert H. Wills, Intergrid, LLC

Comment on Proposal No: 13-51

Recommendation: The new proposed text for 690.47(C) was Accepted in Principle by CMP-13. Input from members of the PV industry has resulted in a request for the following changes. The proposed text for 690.47(C) should be revised as follows:

(C) Systems with Alternating-Current and Direct-Current Grounding Requirements. Systems with alternating-current and direct-current grounding requirements shall be designed in accordance with items (1) through (7) below:

(1) Where photovoltaic power systems have both alternating-current (ac) and direct-current (dc) grounding requirements, the dc grounding system shall be bonded to the ac grounding system. A grounding system (ac or dc) consists of the various components needed to meet the requirements of Article 690.

(2) A bonding conductor between these systems and equipment grounding conductors in these systems shall be sized as the larger of the dc requirement (according to 690.45) and the ac requirements (based on the inverter alternating current overcurrent device rating and 250.122).

(3) A conductor that serves as both an equipment grounding conductor and as part of the bond between ac and dc systems for an inverter incorporating dc ground-fault protection shall meet the requirements of equipment grounding bond jumpers in accordance with 250.102 (250.102) but shall not be subject to the requirements for bonding jumpers (250.28). A single conductor shall be permitted to be used to perform the multiple functions of dc grounding, ac grounding and bonding, between ac and dc systems.

(4) A bonding conductor or equipment grounding conductor that serves multiple inverters shall be sized based on the sum of applicable maximum currents used in (2).

(5) A common ground bus may be used for both systems.

(6) A common grounding electrode may be used for both systems in which the grounding electrode conductor shall be connected to the ac ground system bonding point.

(7) For systems with utility-interactive inverters, the premises grounding system serves as the ac grounding system.

Substantiation: In response to (1) above, the submitter has requested in a letter to the NEC staff that the text “shall be permitted to…” in (6) be removed. The TCC staff understands that they have previously clarified this point.

Final Action: Accept in Principle (690.47(C))

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-52

Recommendation: I suggest that the Panel reconsider its vote to reject this proposal. The proposal is technically correct and is not covered by Panel Actions on any other proposal. Here is the proposal:

690.47(C)(3) DC Grounding-Conductors for Multiple Inverter Installations A single, direct-current common grounding electrode conductor shall be permitted to connect each separate inverter in grounded, multi-inverter systems. The tap conductors for each inverter and the common grounding-electrode conductor shall each be sized in accordance with 250.166. These taps shall be made with a listed irreversible connector or exothermic welding.

Also: Add the number (3) to the end of 690.47(C) to include this proposal in that list.

Substantiation: Utility interactive PV systems using multiple smaller inverters (i.e. 1000-6000 watts) are frequently installed to provide additive power at much higher levels. Systems with multiple small inverters up to nearly 100 kW have been installed in the US, and larger systems are being planned. Each inverter normally has an internal transformer and, therefore, the dc side of the system must be grounded. Since each PV inverter represents a separate PV system for the building or structure, faults in the dc PV array for one inverter do not affect any of the other inverter systems. For this reason, the size of the common equipment-grounding conductor should be no larger than that required for a single inverter and should be based on 250.166. There is no technical or safety reason to have the common, dc grounding-electrode conductor any larger than the sizes required by 250.166. The larger grounding electrode conductors required for ac multiple separately derived systems in 250.30(A)(4)(a) should not be required for these dc grounding electrode conductors.

Panel Meeting Action: Reject

Panel Statement: The connectors from the grounding system to multiple inverters serve the function of equipment grounding conductors and system bonding conductors. They are not grounding electrode conductors. Additionally, UL 1741 is likely to be revised to clarify grounding requirements and terminology.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R
13-68 Log #92 NEC-P13 Final Action: Accept (690.47(D) (New))

TCC Action: The Technical Correlating Committee understands the panel action on Comment 13-69 addressed this comment.
Submitter: Technical Correlating Committee on National Electrical Code

Proposal on Comment No: 13-53

Recommendation: The Technical Correlating Committee directs that the Panel reconsider the proposal and clarify the language and the placement of the text. In addition, the text needs to be rewritten to be in compliance with the NEC Style Manual. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-69 Log #1739 NEC-P13 Final Action: Accept in Principle in Part (690.47(D))

TCC Action: The Technical Correlating Committee understands that the panel action on Comment 13-52 modifies the action on this comment.
Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-53

Recommendation: The PV Industry Forum agrees with and supports the Panel Action and the TCC directions. It is noted that 250.54 should be referenced instead of 250.50 since these supplementary grounding electrodes are not required to be bonded to any other grounding electrodes. Also, it is noted that the reference to building steel should be 250.52(A)(2) rather than 250.52(A)(3).

It is proposed that the following sentence be added at the end of the changes made by the Panel Action:

“The conductor from the grounding electrode to the array frame or structure shall be sized according to 250.166.

Substantiation: The added sentence clarifies the size of the required conductor and indicates that it is a grounding electrode conductor and not an equipment-grounding conductor.

Panel Meeting Action: Accept in Principle in Part

In the first sentence, change the words “close as possible” to “close as practicable.”

In the first sentence of the second paragraph, change “can” to “shall be permitted to...” In the last sentence change “may” to “shall be permitted to...”

The reference to 250.52(A)(3) should be changed to 250.52(A)(2).

Change the two exceptions to read as follows:

“Exception No.1: Array grounding electrode(s) shall not be required where the load served by the array is integral with the array.

Exception No. 2: Additional array grounding electrode(s) shall not be required if located within 6 feet of the premises wiring electrode.”

Panel Statement: The words “can” and “may” were changed to “shall be permitted” in accordance with the style manual.

The reference to 250.52 was corrected.

The exceptions were revised to be complete sentences.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-70 Log #1705 NEC-P13 Final Action: Accept in Principle (690.50)

Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-18

Recommendation: The PV Industry Forum believes that this proposal should be removed and modified to better agree with existing code requirements. The grounding conductors attached to the exposed metal frames of PV modules are most properly referred to as equipment-grounding conductors and the electrical size requirements are given in 690.45. Any change in that requirement should properly be placed in 690.45. As a compromise and to meet the intent of the original submission, the following is suggested as a second paragraph in 690.45.

Equipment grounding conductors shall comply with 250.120(C)

Substantiation: As noted by Panel Comments, many PV modules are furnished as a listed product with provisions for connecting equipment-grounding conductors that can be no larger than 6 AWG. The modules are tested for ground-fault currents at no more than 125% of the short-circuit current which is less than 10 amps. In many PV installations, the PV module equipment grounding conductors can be routed along module frames and mounting racks to afford the needed physical protection. Where larger conductors are required for physical protection, lay-in lugs can be attached to the module frames.

Panel Meeting Action: Accept in Principle

Create a new Section 690.46 to read as follows:

690.46 Array Equipment Grounding Conductors. Equipment grounding conductors for photovoltaic modules smaller than 6 AWG shall comply with 250.120(C).

Panel Statement: The language in Proposal 13-18 was moved to 690.46, because 690.50 falls in Part VI, Marking. The term “equipment bonding jumpers” was changed to “equipment grounding conductors” per the request of the TCC, Section 250.120(C) shall not be smaller than 6 AWG.

Without this clarification, Section 690.46 could imply that equipment grounding conductors should be no larger than 6 AWG.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

Comment on Affirmative:

BOWER, W.: I agree with the Panel Meeting Action to accept 690.46 and place the language in an appropriate section of Article 690. However, the title, “690.46 Array Equipment Grounding Conductors” would be much less ambiguous if it were to read 690.46 “Installation of Array Equipment Grounding Conductors” since this follows 690.45 that reads “Size of Equipment Grounding Conductor” and it would then better match 250.120 that is entitled “Equipment Grounding Conductor Installation”.

13-71 Log #93 NEC-P13 Final Action: Accept (690.53)

Submitter: Technical Correlating Committee on National Electrical Code

Proposal on Comment No: 13-54

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the NEC Style Manual. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Revise the section as follows:

690.53 Direct-Current Photovoltaic Power Source. A marking permanent label for the direct-current photovoltaic power source indicating items (1) through (9) shall be provided by the installer at the photovoltaic disconnecting means for the following:

(1) Operating current. Rated maximum power-point current.
(2) Operating voltage. Rated maximum power-point voltage.
(3) Maximum system voltage.
(4) Short-circuit current. FPN to (4): See 690.8(A) for calculation of maximum circuit current.
(5) Maximum rated output current of the charge controller (if installed). FPN to (5): See 690.8(A) for calculation of maximum circuit current.
(6) Grounding conductor. FPN to (6): See 690.45 for size of equipment grounding conductor. Equipment grounding conductor “shall be” since this follows 690.45 that reads “Size of Equipment Grounding Conductor” and it would then better match 250.120 that is entitled “Equipment Grounding Conductor Installation”.

13-72 Log #94 NEC-P13 Final Action: Accept (690.57)

TCC Action: The Technical Correlating Committee directs that the new 690.57 be located as the first section in Part VII.

Submitter: Technical Correlating Committee on National Electrical Code

Proposal on Comment No: 13-56

Recommendation: The Technical Correlating Committee directs that the panel reconsider this proposal and clarify where the text is to be placed since 690.57 is in Part VI, dealing with marking.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

BOWER, W.: As group leader of the Task Group that reviewed all Article 690 comments, I find that the task group recommendation for this proposal was to accept and to change the section number form 690.57 to 690.19 but was based on acceptable language for 690.19. However, it appears that the action is invalid since comment 13-73 was rejected and the earlier panel action to accept in principle the proposal 13-56 introduces technically incorrect requirements. The new proposed language was:

“690.19. Multiple Source Disconnect: Where a circuit or load can receive power from multiple sources and there is no clear indication of the energized status of the circuit or load a single disconnect shall be used to disconnect that circuit or load from all sources of power.”

FPN: The required disconnect ensures that the energized condition of the load or circuit is clearly determined where an automatic transfer switch inside or external to other equipment does not indicate the status of its output.

I CAN FIND NO APPARENT AGREED UPON, TECHNICALLY CORRECT, LANGUAGE FOR THE NEW 690.19. THE PANEL ACTION FOR 13-73 SHOULD BE CHANGED FROM REJECT TO ACCEPT. See also comments on 13.73.
13-73 Log #1740 NEC-P13

Submitter: Mexico State University / Rep. PV Industry Forum

Final Action: Accept

Comment on Proposal No: 13-74

Mexico State University / Rep. PV Industry Forum

Final Action: Accept in Part (690.64(A))

TCC Action: The Technical Correlating Committee directs that the sentence added to 690.64(A)(2) in the accepted text in Comment 13-77 from Comment 13-75 read as follows:

“In systems with series-connected panelboards connected in series, panel boards or sub panels the rating of the first overcurrent device directly connected to the output of a utility-interactive inverter(s) shall be used in the calculations for all busbars and conductors.”

Submitter: John C. Giles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

Comment on Proposal No: 13-59

Recommendation: The PV Industry Forum withdraws this proposal in favor of the CMP 9 rewrite of the entire Section 690.64. To deviations from the CMP-9 submittal are underlined and explained below. This is the entire Section as submitted with the two revisions shown underlined. ALL TEXT IS NEW and REPLACES THE EXISTING 690.64.

690.64 Point of Connection. The output of a utility-interactive inverter shall be connected as specified in either 690.64(A) or 690.64(B).

(A) Supply Side. The output of a utility-interactive inverter shall be permitted to be connected to the supply side of the service disconnecting means as permitted in 230.82(6).

(B) Load Side. The output of a utility interactive inverter shall be permitted to be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises, provided that all of the conditions in (C) are met.

(C) Interconnection Limitations for Distribution Equipment. Where distribution equipment, including switchboards and panel boards, is fed simultaneously by a primary source(s) of electricity and one or more utilityinteractive inverters, and where this distribution equipment is capable of supplying multiple branch circuits or feeders or both, the interconnection provisions for the utility-interactive inverter(s) shall comply with (1) through (7).

(1) Dedicated Overcurrent and Disconnect. Each source interconnection shall be made at a dedicated circuit breaker or fusible disconnecting means.

(2) Bus or Conductor Rating. The sum of the amperes ratings of overcurrent devices in circuits supplying power to a bus or conductor shall not exceed 120 percent of the rating of the busbar or conductor. In systems with series-connected panel boards or subpanels, the rating of the first overcurrent device directly connected to the output of a utility-interactive inverter(s) shall be used in the calculations for all busbars and conductors.

(3) Ground-Fault Protection. The interconnection point shall be on the line side of all ground-fault protection equipment.

Exception: Connections shall be permitted to be made to the load side of ground-fault protection equipment, provided that there is ground-fault protection for equipment from all ground-fault current sources. Ground-fault protection devices used with supplies connected to the load-side terminals shall be identified and listed as suitable for backfeeding.

(4) Marking. Equipment containing overcurrent devices in circuits supplying power to a bus or conductor supplied from multiple sources shall be marked to indicate the presence of all sources.

(5) Suitable for Back Feed. Circuit breakers, if backfed, shall be suitable for such operation.

FPN: Circuit breakers that are marked “Line” and “Load” have been evaluated only in the direction marked. Circuit breakers without “Line” and “Load” markings are evaluated in both directions.
The PV Industry Forum requests clarification and confirmation of the CMP.

**WARNING**

PHOTOVOLTAIC SYSTEM SOURCE OUTPUT

DO NOT RELOCATE THIS OVERCURRENT DEVICE

**Substantiation:** The revisions to the CMP-9 submittal are as follows:
1. In 690.64(C)(2), a second sentence was added to address the frequent situation where there are multiple series-connected panel boards in a system. For example, a 15-amp backfed breaker in a 100-amp panel might allow the connection of a utility-interactive inverter on the 10th floor of a building. That 100-amp panel is fed by a 100-amp breaker in a 400-amp panel in the middle of the building which, in turn, is fed by a 400-amp breaker in a 1000-amp service entrance panel. At the 1000-amp service panel, the existing wording of 690.64 (as interpreted by inspectors and previous CMPs) requires that the 400-amps be counted as the backfed breaker in this 1000-amp panel, not the 15-amp breaker attached to and limiting the backfed current from the inverter. The added sentence clarifies that the first breaker (15-amps) attached to the inverter output is to be used in the calculation. Explanatory diagrams are attached.
2. The title on 690.64(C)(7) was changed to “Opposite-End Connections” to avoid duplicating the title on 690.64(C)(2).

The PV Industry Forum requests clarification and confirmation of the CMP calculation of a 4% possible added heating due to a potential 120% increase in load currents. Other calculations indicate that the potential heating may be as high as 44%. Other panel board manufacturers have indicated that the overheating is not an issue as long as the panel is fed at opposite ends.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Accept in Part

Add the following sentence to 690.64(B)(2) in the action for Comment 13-77:

In systems with series-connected panel boards or subpanels, the rating of the first overcurrent device directly connected to the output of a utility-interactive inverter(s) shall be used in the calculations for all busbars and conductors.

**Panel Statement:** This information provides clarification for determining bus or conductor ratings.

**Number Eligible to Vote:** 17

**Ballot Results:** Affirmative: 15 Negative: 2

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:** STAFFORD, T.: Even though the added sentence would be good to have in the 2008 NEC, it is material that has not had public review, and is considered new material and should be held for the public comment IAW Section 4.4.6.2.2 of NFPA Regulations Governing Committee Projects. NEMA manufacturers of panelboards, switchboards, overcurrent devices, (both fuses and circuit breakers) would probably be interested in the additional requirements that this new wording place into effect.

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13-77 Log #1746 NEC-P13 Final Action: Accept in Principle (690.64(A))

**Submitter:** John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

**Comment on Proposal No:** 13-60

**Recommendation:** The PV Industry Forum withdraws this proposal in favor of the CMP-9 submittal of a revision to the entire 690.64. See 13-59 Log 2100. The PV Industry Forum requests clarification and confirmation of the CMP calculation of a 4% possible added heating due to a potential 120% increase in load currents. Other calculations indicate that the potential heating may be as high as 44%. Other panel board manufacturers have indicated that the overheating is not an issue as long as the panel is fed at opposite ends.

**Substantiation:** None given.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See the panel action on Comment 13-77.

**Number Eligible to Vote:** 17

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 1 Gustafson, R.

13-77 Log #311 NEC-P13 Final Action: Accept in Principle (690.64(B))

**TCC Action:** The Technical Correlating Committee directs that the phrase “shall have been sized” be changed to “shall be sized” to comply with the NEC Style Manual.

**Submitter:** Code-Making Panel 9, Comment on Proposal No. 13-61

**Recommendation:** Revise the panel action on this proposal as modified by the action on Proposal 13-69 to read as follows (legislative formatting in this comment applies to differences from the CMP-13 action text, and not in respect to the 2005 NEC):

**690.64 Point of Connection.** The output of a utility-interactive inverter shall be connected as specified in 690.64(A) or 690.64(B).

(A) Supply Side. The output of a utility-interactive inverter shall be permitted to be connected to the supply side of the service disconnecting means as permitted in 230.82(6).

(B) Load Side. The output of a utility-interactive inverter shall be permitted to be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises, provided that either condition (1) or all of the conditions (2) through (6) in (C) are met.

(C) Interconnection Limitations for Distribution Equipment. Where distribution equipment, including switchboards, and panelboards, is fed simultaneously by a primary source(s) of electricity and one or more utility-interactive inverters, and where this distribution equipment is capable of supplying multiple branch circuits or feeders or both, the interconnecting provisions for the utility-interactive inverter(s) shall comply with (1) through (7).

(1) The PV supply overcorrect/disconnect device shall be installed in a panelboard and positioned furthest from the feeder or service connection.

(2) Each source interconnection shall be made at a dedicated circuit breaker or fusible disconnecting means.

(3) The interconnection point shall be on the line side of all ground fault protection equipment.

(4) Ground connection shall be permitted to be made to the load side of ground fault protection equipment.

(5) Enclosure connection shall be permitted to be made to the load side of ground fault protection equipment.

(6) Equipment containing more than one circuit supplying power to a busbar or conductor shall be marked at the overcorrect device for each supply.

(7) Ground protection equipment shall be installed with supplies connected to the load side terminals shall be dedicated and listed as suitable for backfeeding.

**FPN:** Circuit breakers that are marked “Line” and “Load” are not identified as suitable for backfeeding.

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13-77 Log #1775 NEC-P13

**Final Action:** Accept in Principle (690.64(C))

**Submitter:** John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum

**Comment on Proposal No:** 13-66

**Recommendation:** The PV Industry Forum withdraws this proposal in favor of the CMP-9 submittal of a revision to the entire 690.64. See 13-59 Log 2100. The PV Industry Forum requests clarification and confirmation of the CMP calculation of a 4% possible added heating due to a potential 120% increase in load currents. Other calculations indicate that the potential heating may be as high as 44%. Other panel board manufacturers have indicated that the overheating is not an issue as long as the panel is fed at opposite ends.

**Substantiation:** None given.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See the panel action on Comment 13-77.

**Number Eligible to Vote:** 17

**Ballot Results:** Affirmative: 16

**Ballot Not Returned:** 1 Gustafson, R.
PHOTOVOLTAIC SYSTEM SOURCE OUTPUT

10 Affirmative

CMP-9 agrees that it is possible to assure that the busbars of panelboards to be connected to the supply side of the service disconnecting means as per the requirements of the overcurrent devices supplying it, a connection in a panelboard shall be positioned at the opposite (load) end from the input feeder location or main circuit location. A permanent warning label shall be applied to the distribution equipment with the following or equivalent wording:

WARNING

PHOTOVOLTAIC SYSTEM SOURCE OUTPUT
DO NOT RELOCATE THIS OVERCURRENT DEVICE

Substantiation: Although the Technical Correlating Committee requested that CMP-9 comment on Proposal 13-61, and by this comment the panel has done so, the terminology is unchanged in that and in the associated proposals apply to all systems capable of interconnection and parallel operation using multiple sources. For this reason, CMP-9 believes that the CMP-13 actions in Articles 690, 692, and 705 must be correlated in this respect, and is providing comments to the comparable proposals and panel actions in all of these articles. In addition, the layout and content of this comment reflect a consistency of approach that assures correlation with the corresponding language in Articles 692 and 705.

CMP-9 agrees that it is possible to assure that the busbars of panelboards receiving supply current from two sources can be arranged so the busbars will not exceed their ampacity (the “opposite end” scenario accepted under this proposal), however, CMP-9 points out that such an arrangement allows for up to double the amount of load to be taken from the panel for indefinite periods of time. Current product standards do not anticipate the effect of I2R heating losses under these conditions, which could severely impact the performance of essential components within the distribution equipment. Before the NEC recognizes this type of connection, it is essential that careful testing be carried out to determine the acceptable parameters that should be applied in these cases.

For example, if a large PV system provides 100 amperes of power to a panel in an interactive system rated 100 amperes, and this panel is supplied by a normal utility supply of 100 amperes, the branch circuit and feeder loads supplied by this panel could total 200 amperes. Although such a load should not exist due to required sizing rules relative to Article 220 calculations, the requirement for individual protection for panelboards (now set to apply to all panelboards by virtue of CMP-13 action in this cycle) anticipates that these load calculations are easily circumvented given the relative ease of circuit modifications.

CMP-9 is suggesting revisions to the backfeed allowance that more closely track the actual provision in Article 408 that is intended to be varied in this Chapter 6 article. Our wording also omits the deadfront clamping language in the proposal because such construction is clearly required by the product standard and pointless here; furthermore, the deadfront does not actually “clamp all circuit breakers to the panelboard busbars.” In addition, we are offering a different version of the fine print note to address concerns raised in the voting. CMP-9 understands that CMP-13 was using the term “identified” in its Article 100 sense and not in the sense of a marking, however, this wording avoids any confusion. Other changes are editorial and in the interest of correlation, where technically appropriate, with other interactive articles.

CMP-9 expresses its willingness to assign a task group to work with CMP-13 and other industry parties to provide a carefully substantiated global approach to double-fed distribution equipment applied in interactive settings for the 2011 NEC. This might include specially targeted allowances for equipment listings that would cover such interconnections. In the mean time, this comment anticipates that these load calculations are easily circumvented given the relative ease of circuit modifications.

The panel corrected the spelling of “overcorrect” to “overcurrent”, reorganized (B) and (C) into a single section (B) for user-friendliness. Added “The bus or conductor rating shall have been sized for the loads connected in accordance with Article 220.” to (7) to satisfy intent of Comment 13-78. Revised the heading for (7) to eliminate duplication.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

Comment on Affirmative:

BOWER, W.: The CMP 9 reviews and suggested changes were extensive and comprehensive, and the panel is to be commended on a job well done. My comments for this Public Comment are editorial in nature as below.

Note that the panel reorganized (B) and (C) into a single section (B) but that is not reflected in the report.

In 690.64(C)(3) the term “Ground Fault” in the title should be changed to “Ground-fault.”
In 690.64(C)(4) the term “overcurrent” should be changed to “overcurrent.”
In 690.64(C)(7) the term “panelboard” should be changed to “panelboard,” the spelling of “Article” should be changed to “Article,” the word “equivalent” should be changed to “equivalent” and the last word “working” should be changed to “marking.”

13-78 Log #1179 NEC-P13 Final Action: Accept in Principle (690.64 (B))


Panel Meeting Action: Accept in Principle

Revise the wording of the Panel action for 690.64(B)(5)(b) per Mr. Hornberger’s comment, as follows: 690.64(B)(5)(b) End Feed Connection. Where the utility-interactive inverter breaker or fusible disconnect is connected in the distribution equipment at the opposite (load) end from the input feeder connection or main circuit location, the bus or conductor rating shall be equal to or larger than the sum of the ampere ratings of all overcurrent devices supplying current to the branch circuits or feeders or both, the interconnecting provisions for the utility-interactive inverter(s) shall comply with (1) through (7); (1) In 690.64(C)(3) the term “Ground Fault” in the title should be changed to “Ground-fault.”
(2) In 690.64(C)(4) the term “overcurrent” should be changed to “overcurrent.”
(3) In 690.64(C)(7) the term “panelboard” should be changed to “panelboard,” the spelling of “Article” should be changed to “Article,” the word “equivalent” should be changed to “equivalent” and the last word “working” should be changed to “marking.”

WARNING

ELECTRIC POWER PRODUCTION SOURCE OUTPUT
DO NOT RELOCATE THIS OVERCURRENT DEVICE

Panel Meeting Action: Accept in Principle

Substantiation: The Panel’s wording of 690.64(B)(5)(b) will permit the sum of the overcurrent devices supplying current to a bus or conductor to exceed the ampacity rating of the bus or conductor by 200%. If the bus or conductor is not sized for the loads served, in accordance with Article 220, an overload condition may exist on the bus or conductor that would not be detected by any of the overcurrent devices supplying current to the system. In addition, this is a “generic” requirement for utility interactive inverters and not specifically a photovoltaic system issue. Please see recommended wording and relocation as part of Mr. Hornberger’s comment on Proposal 13-184 to incorporate a reference to Article 220 and move the text to Article 705.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 13-77.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
13-79 Log #1324 NEC-P13 Submitter: Vincent J. Saporita, Cooper Bussmann
Final Action: Accept in Principle

Comment on Proposal No: 13-61

Recommendation: Replace the phrase “circuit breaker” with the phrase “disconnecting means” in the proposed last sentence of (3)(b).

(b) Where connected at the opposite (farthest) end of the busbar from the feeder or service, the sum of ampere rating of the backfed PV supply overcurrent/disconnect device(s) shall not exceed the rating of the busbar or conductor. The following permanent plaque shall be installed at the PV supply connection or circuit breaker disconnecting means location:

Substantiation: As written, the user might be led to think that only a circuit breaker could be utilized. This suggested change would make it clear that circuit breakers are not the only types of disconnecting means to be allowed. For example, a fuse switch could be utilized as the disconnecting means.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 13-77.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-80 Log #1747 NEC-P13 Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Final Action: Accept

Comment on Proposal No: 13-61

Recommendation: The PV Industry Forum withdraws this proposal in favor of the CMP-9 submittal of a revision to the entire 690.64. See 13-59 Log 2100.

Substantiation: None given.

Panel Meeting Action: Accept

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-81 Log #2293 NEC-P13 Submitter: Todd Stafford, IBEW-NJATC / Rep. IBEW
Final Action: Reject

Comment on Proposal No: 13-61

Recommendation: The panel should reverse its action and revert to the 2005 code for section 690.64(B).

Substantiation: Upon reviewing the negative comments submitted by Hornberger and Nasby, it is apparent that the panel action taken will not create a safer installation. Considerable technical information is needed to properly address the issue of connecting PV interactive inverters to a bus or conductor to allow the interconnection to be properly performed. The changes made by the Panel during the ROP stage does not address the concerns raised.

Panel Meeting Action: Reject

Panel Statement: The panel actions on Comment 13-77 address the concerns of the submitter.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-82 Log #96 NEC-P13 Submitter: Technical Correlating Committee on National Electrical Code
Final Action: Accept

Comment on Proposal No: 13-61a

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the NEC Style Manual, and the Panel clarify the Panel Action on this Proposal by adding the word “and” following the end of requirement (d), and commas after requirements (a) through (d) rather than periods.

This action will be considered by the Panel as a Public Comment.

Panel Meeting Action: Accept

Panel Statement: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-83 Log #1748 NEC-P13 Submitter: John C. Wiles, Southwest Technology Development Institute, New Mexico State University / Rep. PV Industry Forum
Final Action: Accept in Principle

Comment on Proposal No: 13-61a

Recommendation: The PV Industry Forum proposes that this proposal should be rejected. The proposal imposes a complex set of five requirements that are not easily understood. The existing provisions of Article 690 adequately address the connection of utility-interactive inverters to dedicated circuits. Converting the branch circuit to a feeder by adding a subpanel would also address the need. Branch circuits with permanently connected loads like outside air conditioner compressors and other large motor loads are typically specified with very definite overcurrent devices based on the running and locked rotor amps of such units. To connect a PV inverter to such a circuit would significantly complicate those well-established calculations and requirements. Furthermore, the starting surge, voltage drops associated with such loads could possibly cause any PV inverter to trip off line as required by UL Standard 1741.

Code making actions this cycle with increased requirements for AFCI and GFCI protection of nearly all branch circuits would make the connections allowed by this proposal unworkable and could create safety hazards if GFCI and AFCI equipment were backfed.

Substantiation: None given.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 13-84.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-84 Log #2295 NEC-P13 Submitter: Todd Stafford, IBEW-NJATC / Rep. IBEW
Final Action: Accept

Comment on Proposal No: 13-61a

Recommendation: Delete proposed 690.64(B)(1) Exception.

Substantiation: The panel action was incorrect in allowing the connection of a utility interactive inverter to a dedicated branch circuit serving permanently connected loads. See panel action taken on 13-63 which specifies why connection to branch circuits is not allowed. The connection of a utility interactive inverter is the cause of the potential lack of overcurrent protection, not the issue of it being cord and plug connected as stated in 13-63. The result is the same, an overcurrent condition without protection from an overcurrent protection device.

Panel Meeting Action: Accept

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

Final Action: Accept in Principle

Comment on Proposal No: 13-64

Recommendation: Revise the wording of the Panel action for 690.64(B)(5)(b) in Proposal 13-61 per Mr. Hornberger’s comment as follows:

690.64(B)(5)(b) End Feed Connection. Where the utility-interactive inverter breaker or fusible disconnect is connected in the distribution equipment at the opposite (load) end from the input feeder connection or main circuit location, the bus or conductor rating shall be equal to or larger than the sum of the amperes ratings of all overcurrent devices connecting premise electric power production sources to the bus or conductor. The bus or conductor rating shall have been sized for the loads connected, in accordance with Article 220. A permanent warning label shall be applied to the distribution equipment with the following or equivalent:

**WARNING**

ELECTRIC POWER PRODUCTION SOURCE OUTPUT

DO NOT RELOCATE THIS OVERCURRENT DEVICE.

Substantiation: The Panel’s rewording of 690.64(B)(5)(b) in Proposal 13-61 will permit the sum of the overcurrent devices supplying current to a bus or conductor to exceed the ampacity rating of the bus or conductor by 200%. If the bus or conductor is not sized for the loads served, in accordance with Article 220, an overload condition may exist on the bus or conductor that would not be detected by any of the overcurrent devices supplying current to the system. In addition, this is a “generic” requirement for utility interactive inverters and not specifically a photovoltaic system issue. Please see recommended rewording and relocation as part of Mr. Hornberger’s comment on Proposal 13-184 to incorporate a reference to Article 220 and move the text to Article 705.

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70-419
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 13-77.
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.
1 Gustafson, R.

1. Please accept the original proposed modifications in 692.1 Scope as published in the ROP.
2. Please delete the definition of Interactive System, as it will now appear in Article 100. Please delete the title and definition of Point of Common Coupling. Please do not delete the title of the definition of Maximum System Voltage and the title of the definition of Stand-Alone System as published in the ROP.
3. Please accept the modifications made in the original proposal to 692.3 Other Articles to correspond with the rewrite of Article 705. The proposed added and deleted text for this section is published in the ROP on page 70-750.
4. Please delete the complete title and text of 692.62 Loss of Interactive System Power as recommended in the original proposal to correspond with the rewrite of Article 705. This information corresponds with the rewrite of Article 705 and is now included there.
5. Please delete the title and text of 692.64 Unbalanced Interconnections as recommended in the original proposal. This information corresponds with the rewrite of Article 705 and is now included there.

Substantiation: Code Making Panel 13 is to be commended for the fine job on the work on the rewrite of Article 705 and revision to Article 690 and Article 692 as it appears in the NEC 2008 Draft. This committee is a companion comment to the comment on Proposal 13-184 dealing with the rewrite of Article 705. There is also a companion comment to the comment on Proposal 13-17 dealing with comment on Article 690. It may be best to review the comment on Article 705, proposal 13-184 before reviewing this comment and the one on 13-17. It is recognized that the Fuel Cell community has done great work in promoting and advancing the fuel cell technology for electric power production. While there may be reluctance to remove the utility-interconnection requirements from both Articles 692 and 690, it is the best organization for the NEC to keep the nonspecific interconnection requirements in Article 705 scoped specifically for the interconnection of electric power sources and any specific technology installation requirements such as photovoltaic and fuel cells in their separate articles.

The main purpose of the original proposal is to consolidate non-photovoltaic utility interconnection issues with distributed generation in Article 705 and photovoltaic-specific technical issues in Article 690. Having nonphotovoltaic utility interconnection issues duplicated within Article 692 causes confusion with Article 705 that is intended to deal with utility interconnection issues with all distributed generation sources.

The intent of this comment on the original proposal is to clarify and correct the issues in Article 692 based on the rewrite of Article 705 and on the affirmative comments as published in the Report on Proposals suggested by the members of CMP-13. The original proposal as published in the ROP was used to identify the changes as originally proposed.

Panel Meeting Action: Reject
Panel Statement: The panel rejects the proposal in order to satisfy the intent of the original panel action on the proposal by keeping Article 692 intact while transferring selected language related to interconnection to Article 705.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-94 Log #1182 NEC-P13 Final Action: Reject (692)

Comment on Affirmative:

HORNBERGER, B.: I agree with the panel action, however the panel discussed recommending that a Task Group be formed to review the redundant “Point of Connection” requirements for PV in 690, Fuel Cells 692 and Interconnected Electric Power Sources 705. There is no mention of this in the panel statements. The panel harmonized most of these requirements through their actions on comments 13-77, 13-97, and 13-262. Photovoltaic and Fuel Cell systems are “Interconnected Electric Power Sources”, when they operate in parallel with another supply source. Article 705 should apply. Point of connection requirements in Articles 690 and 692 should only contain “special” considerations that pertain to the specific power source technology.

13-95 Log #2197 NEC-P13 Final Action: Accept (692)


Comment on Proposal No: 13-71

Recommendation: Reject the proposed change.

Substantiation: The panel acknowledged the value of such a proposal and accepted this proposal in principle to permit public comment of the proposal. Comments have been received and will be reviewed further at the CMP-13 ROC meeting in November. But, feedback to this point indicates that to adequately address the concerns of a change of this magnitude and craft language that will neither omit nor introduce wording that will compromise safety for the affected industries that a working group will need to convene to provide a comprehensive proposal for the 2011 NEC. The proposal should be rejected by the panel to ensure that the changes indicated in the 2008 NEC are not inadvertently included in the final publication.

Panel Meeting Action: Accept
Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-96 Log #97 NEC-P13 Final Action: Accept (692.41)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 13-72

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal that the intent is to delete the existing text in 692.41 and (A)(A) and (B) as it appears in the 2005 NEC and replace it with the text in this proposal.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: It is the panel’s intent to delete the existing text in 692.41 and (A) and (B) as it appears in the 2005 NEC and replace it with the text in the proposal.

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

13-97 Log #314 NEC-P13 Final Action: Accept in Principle (692.65)

TCC Action: The Technical Correlating Committee directs that the phrase “shall have been sized” be changed to read “shall be sized” to comply with 3.3.1 of the NEC Style Manual.


Comment on Proposal No: 13-74

Recommendation: Modify the panel action as follows (legislative formatting in this comment applies to differences from the CMP-13 action text, and not in respect to the 2005 NEC).

692.65 Utility-Interactive Point of Connection. The output of a utility interactive inverter shall be connected as specified in 692.65(A) or 692.65(B). Distribution equipment fed by both primary and electric power production sources shall comply with (C).

(A) Supply Side. A utility-interactive inverter shall be permitted to be connected to the supply side of the service disconnecting means as permitted in 250.82(C).

(B) Load Side. A utility-interactive inverter shall be permitted to be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises, provided that all of the following conditions of 692.65(A) through 692.65(B) are met:

1. Dedicated Overcurrent and Disconnect. Each source interconnection shall be made at a dedicated circuit breaker or fusible disconnecting means.
Panel Meeting Action: Accept in Principle
Revise CMP-9’s 692.65(B) and (C) as follows:

692.65 Point of Connection. The output of a utility-interface inverter shall be connected as specified in 692.65(A) or 692.65(B).

(A) Supply Side. The output of a utility-interface inverter shall be permitted to be connected to the supply side of the service disconnecting means as permitted in 230.82(6).

(B) Load Side. The output of a utility-interface inverter shall be permitted to be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises. Where distribution equipment including switchboards and panelboards is fed simultaneously by a primary source(s) of electricity and one or more utility-interface inverters, and where this distribution equipment is capable of supplying multiple branch circuit feeders or overcurrent devices, any provisions for the utility-interface inverter(s) shall comply with (1) through (7).

1. Dedicated Overcurrent and Disconnect. Each source interconnection shall be made at a dedicated circuit breaker or fusible disconnecting means.

2. Bus or Conductor Rating. The sum of the ampere ratings of overcurrent devices in circuits supplying power to a busbar or conductor shall not exceed 120 percent of the rating of the busbar or conductor.

3. Ground Fault Protection. The interconnection point shall be on the line side of all ground-fault protection equipment.

Exception: Connection shall be permitted to be made to the load side of ground-fault protection, provided that there is ground-fault protection for equipment from all ground-fault current sources. Ground-fault protection devices used with supplies connected to the load-side terminals shall be identified and listed as suitable for backfeeding.

4. Marking. Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor shall be marked to indicate the presence of all ground-fault current sources. Ground-fault protection equipment from all ground-fault current sources. Ground-fault protection devices used with supplies connected to the load-side terminals shall be identified and listed as suitable for backfeeding.

5. Suitable for Back Feed. Circuit breakers, if backfed, shall be suitable for such operation.

FPN: Circuit breakers that are marked “Line” and “Load” have been evaluated only in the direction marked. Circuit breakers without “Line” and “Load” have been evaluated in both directions.

6. Fastening. Listed plug-in type circuit breakers backfed from utility-interface inverters complying with 692.60 shall be permitted to omit the additional fastener normally required by 408.36(F) for such applications.

7. Inverter Output Connection. Unless the panelboard is rated not less than the sum of the ampere ratings of all overcurrent devices supplying a connection in a panelboard shall be permitted to be made at a dedicated circuit breaker or fusible disconnecting means. Where distribution equipment including switchboards and panelboards is fed simultaneously by a primary source(s) of electricity and one or more utility-interface inverters, and where this distribution equipment is capable of supplying multiple branch circuit feeders or overcurrent devices, any provisions for the utility-interface inverter(s) shall comply with (1) through (7).

WARNING

ELECTRIC POWER PRODUCTION SOURCE OUTPUT

1. DO NOT RELOCATE THIS OVERCURRENT DEVICE

(2) General Connection.

Where the utility interactive inverter breaker or fusible disconnect is not end fed, the bus or conductor rating shall be equal to or larger than the sum of the ampere ratings of all overcurrent devices connected to the output of the inverter. The output of the inverter shall be marked to indicate the presence of all ground-fault current sources. Ground-fault protection equipment from all ground-fault current sources. Ground-fault protection devices used with supplies connected to the load-side terminals shall be identified and listed as suitable for backfeeding.

Substantiation: Although the Technical Correlating Committee requested CMP-9 to comment on Proposal 13-61, and the panel has done so, the technical issues raised in that and in the associated proposals apply to all systems capable of interconnection and parallel operation using multiple sources. For this reason, CMP-9 believes that the CMP-13 actions in Articles 690, 692, and 705 must be correlated in this respect, and is providing comments to the comparable proposals and panel actions in all of these articles. For example, the ground-fault exception presented here correlates with the approach in Proposal 13-61.

CMP-9 agrees that it is possible to assure that the busbars of panelboards receiving supply current from two sources can be arranged so the busbars will not exceed their ampacity (the “opposite end” scenario accepted under this proposal), however, CMP-9 points out that such an arrangement allows for up to double the amount of load to be taken from the panel for indefinite periods of time. Current product standards do not anticipate the effect of I2R heating losses under these conditions, which could severely impact the performance of essential components within the distribution equipment. Before the NEC recognizes this type of connection, it is essential that careful testing be carried out to determine the acceptable parameters that should be applied in these cases.

For example, if a fuel cell system provides 100 amperes of power to a panel in an interactive system rated 100 amperes, and this panel is supplied by a normal utility supply of 100 amperes, then the load supplied by this panel could total 200 amperes. Although such a load should not exist due to required sizing rules relative to Article 220 calculations, the requirement for individual protection for panelboards (now set to apply to all panelboards by virtue of CMP-9 action in this cycle) anticipates that these load calculations are easily circumvented given the relative ease of circuit modifications.

CMP-9 expresses its willingness to assign a task group to work with CMP-13 and other interested industry parties to provide a carefully substantiated global approach to double-fed distribution equipment applied in interactive settings for the 2011 NEC. This might include specially targeted allowances for equipment listings that would cover such interconnections. In the mean time, this comment does broaden the 120 percent allowance from dwellings to all occupancies. Because of the I2R relationship, an allowance for an additional 20 percent loading (one fifth) would only increase the heating losses by 4 percent (one fifth), which should be tolerated by existing equipment designs even if the interconnection does not occur at the opposite end of the bus from the normal supply. This comment incorporates the opposite-end rule from the CMP-13 action on this proposal as a trade-off for the occupancy expansion, thereby ensuring that an overloaded busbar does not exacerbate the heating problem.

This comment has been balloted through CMP-9 with the following balloting results:

11 Eligible to Vote
10 Affirmative
1 Not Returned (H. deVega)

Number Eligible to Vote: 17
Ballot Results: Affirmative: 16
Ballot Not Returned: 1 Gustafson, R.

Comment on Affirmative:

BOWER, W.: In 692(B)(3), the term “Ground Fault” in the title should be changed to “Ground-fault”.

13-98 Log #2196 NEC-P13 Final Action: Accept in Principle (692.65(B)(2))

Comment on Proposal No: 13-74
Recommendation: Modify the proposed wording to conform with the 8/1/2006 memorandum from CMP-9 on this proposal and the follow-up comments from the PV Industry Forum to Proposal 13-61. Add the comment to permit the 120 percent allowance substantiated in the CMP-9 memorandum and included in their comments to Proposal 13-61.

Substantiation: Although it could be argued that circumventing the language of the NEC will necessarily increase hazards, this writer concedes that the relative ease of circumventing the rules of Article 220 make it prudent at this time to revise the text as recommended by CMP-9 and the PV Industry Forum. The above comment will address this concern as well as provide consistency between Articles 690 and 692. The recommendation to add the 120 percent allowance is also made for consistency with the NEC-P13 recommendation for Proposal 13-61 as well as the substantiation section for Proposal 13-74, but it has been omitted from their text of the revised, proposed wording for Proposal 13-74.
WARNING ELECTRIC POWER PRODUCTION SOURCE OUTPUT

DO NOT RELOCATE THIS OVERCURRENT DEVICE.

The system. In addition, this is a "generic" requirement for utility interactive

Inverter/interactive inverters to a bus or conductor to allow this

interconnection to be properly performed. The changes made by the Panel

during the ROP stage does not address the concerns raised. See my comments

to the negative for the ROP stage as well as those submitted by Hornberger.

Panel Meeting Action: Rejeet

Panel Statement: See panel action and statement on Comment 13-97.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-99 Log #2298 NEC-P13 (692.65(B)(2)) Final Action: Reject

Submitter: Todd Stafford, IBEW-NJATC / Rep. IBEW

Comment on Proposal No: 13-74

Recommendation: The Panel should reverse its action and revert to the 2005
code for section 692.65(B)(2).

Substantiation: The panel action will not create a safer installation.

Considerable technical information is needed to properly address the issue of

converting PV inverters/interactive inverter to a bus or conductor to allow this

interconnection to be properly performed. The changes made by the Panel

during the ROP stage does not address the concerns raised. See my comments

to the negative for the ROP stage as well as those submitted by Hornberger.

Panel Meeting Action: Rejeet

Panel Statement: See panel action and statement on Comment 13-97.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-100 Log #1183 NEC-P13 (692.65(B)(5)(a)) Final Action: Accept in Principle

Submitter: Neil F. LaBrace, Jr., National Grid / Rep. Edison Electric Institute-

Electric Light & Power Group

Comment on Proposal No: 13-74

Recommendation: Revise the wording of the Panel action for 692.65(B)(5)(a)

per Mr. Hornberger’s comment, as follows:

692.65(B)(5)(a) End Feed Connection. Where the utility-interactive inverter

breaker or fusible disconnect is connected in the distribution equipment at the

opposite (load) end from the input feeder connection or main circuit location,

the bus or conductor rating shall be equal to or larger than the sum of

the amperes ratings of all overcurrent devices connecting premise electric power

production sources to the bus or conductor. The bus or conductor rating shall

have been sized for the loads connected, in accordance with Article 220. A

permanent warning label shall be applied to the distribution equipment with the

following or equivalent:

WARNING

ELECTRIC POWER PRODUCTION SOURCE OUTPUT

DO NOT RELOCATE THIS OVERCURRENT DEVICE.

Substantiation: The Panel’s wording of 692.65(B)(5)(a) will permit the sum

of the overcurrent devices supplying current to a bus or conductor to exceed the

ampacity rating of the bus or conductor by 200%. If the bus or conductor is not

sized for the loads served, in accordance with Article 220, an overload

condition may exist on the bus or conductor that would not be detected by any

of the overcurrent devices supplying current to the system. In addition, this is a

"generic" requirement for utility interactive inverters and not specifically a fuel

cell system issue. Please see recommended rewording and relocation as part of

Mr. Hornberger’s comment on Proposal 13-184 to incorporate a reference to

Article 220 and move the text to Article 705.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 13-97.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

13-101 Log #1185 NEC-P13 (692.65(B)(5)(a)) Final Action: Accept in Principle

Submitter: Neil F. LaBrace, Jr., National Grid / Rep. Edison Electric Institute-

Electric Light & Power Group

Comment on Proposal No: 13-74

Recommendation: Revise the wording of the Panel action for 692.65(B)(5)(a)

in Proposal 13-74 per Mr. Hornberger’s comment, as follows:

692.65(B)(5)(a) End Feed Connection. Where the utility-interactive inverter

breaker or fusible disconnect is connected in the distribution equipment at the

opposite (load) end from the input feeder connection or main circuit location,

the bus or conductor rating shall be equal to or larger than the sum of

the amperes ratings of all overcurrent devices connecting premise electric power

production sources to the bus or conductor. The bus or conductor rating shall

have been sized for the loads connected, in accordance with Article 220. A

permanent warning label shall be applied to the distribution equipment with the

following or equivalent:

WARNING

ELECTRIC POWER PRODUCTION SOURCE OUTPUT

DO NOT RELOCATE THIS OVERCURRENT DEVICE.

Substantiation: The Panel’s wording of 692.65(B)(5)(a) in Proposal 13-74 will

permit the sum of the overcurrent devices supplying current to a bus or

conductor to exceed the ampacity rating of the bus or conductor by 200%. If the

bus or conductor is not sized for the loads served, in accordance with Article 220,

an overload condition may exist on the bus or conductor that would not be detected by any

of the overcurrent devices supplying current to the system. In addition, this is a

“generic” requirement for utility interactive inverters and not specifically a fuel cell system issue. Please see recommended

rewording and relocation as part of Mr. Hornberger’s comment on Proposal 13-

184 to incorporate a reference to Article 220 and move the text to Article 705.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 13-97.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 16

Ballot Not Returned: 1 Gustafson, R.

ARTICLE 695 — FIRE PUMPS

13-102 Log #98 NEC-P13 (695) Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 13-77

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reported as “Reject” because of the number of technical inconsistencies, style manual issues, and the inclusion of material outside the scope and purpose of Article 695.

It was the action of the Technical Correlating Committee that this proposal be reconsidered by the panel and that the panel limit the requirements to those within the scope of those necessary for a safe electrical installation. The Technical Correlating Committee agrees with the negative commenters that much of the material added by the panel is inappropriate for the NEC. The panel should not attempt to recreate NFPA 20 in the NEC. In addition, the panel is directed to address the large number of style manual issues noted in Mr. Nasby’s negative comment. This action shall be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 13-97.

Number Eligible to Vote: 17

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Gustafson, R.

13-103 Log #1037 NEC-P13 (695) Final Action: Hold

The Technical Correlating Committee directs that the panel action on

Comment 13-103 be reported as “Hold” consistent with Section 4.4.6.2.2 of the

NFPA Regulations Governing Committee Projects.

In reviewing Comment 13-103, the Technical Correlating Committee found a significant number of correlation, style and technical issues that make the rewrite of Article 695 unacceptable. These issues include, but are not limited to:

1. References to material within Article 695 that are incorrect

2. Addition of material from NFPA 20 that is not appropriate for Article 695

3. Requirements added that are outside the scope of Article 695

4. Deletion of text that was not substantiated by any proposal or

5. FPNs that contain requirement and intent statements

6. Redundant text that is already covered by 90.3

Through this Technical Correlating Committee action, Article 695 will appear as it did in the Report on Proposals draft as modified by Comments 13-113 and 13-134.

Although the Technical Correlating Committee is concerned with the fact that there may be valid proposals and comments that will not move forward, the panel’s attempt to rewrite the entire Article without acting on the individual proposals and comments creates technical issues that cannot move forward and cannot be corrected by the Technical Correlating Committee.

Submitter: James S. Nasby, Master Control Systems, Inc.

Comment on Proposal No: 13-77

Recommendation: Revise the text of the TCC write-up in the A2007 ROP to read as follows.

Revisions to the ROP Version of

Article 695 for the 2008 Edition of NFPA-70

ARTICLE 695 Fire Pumps

FPN: Rules that are followed by a reference in brackets contain text that has been extracted from NFPA 20-2006, Standard for the Installation of Stationary Pumps for Fire Protection. Only editorial changes were made to the extracted text to make it consistent with this Code.

695.1 Scope.

(A) Covered. This article covers the installation of the following:

1. Electric power sources and interconnecting circuits

2. Switching and control equipment dedicated to fire pump drivers

3. Associated fire pump accessory equipment

(B) Not Covered. This article does not cover the performance, maintenance, and acceptance testing of the fire pump system, and the internal wiring of the components of the system.


695.2 Definitions.

Fault Tolerant External Control Circuit. Those control circuits entering or leaving the fire pump controller enclosure, which if broken, disconnected, or shorted will not prevent the controller from starting the fire pump from all
other external or external means and may cause the controller to start the pump under these conditions.

On-Site Power Production Facility. The normal supply of electric power for the site where the pump is to be installed must be available at the pump.

On-Site Standby Generator. A facility producing electric power on site as the alternate supply of electric power. It differs from an on-site power production facility in that it is not constantly producing power.

695.3 Power Source for Electric Motor-Driven Fire Pumps. Electric motor-driven fire pumps shall have a reliable source of power.

FPN: See Chapter 10 of NFPA 20.

695.4 Continuity of Power.

(A) Continuously Available. An electric motor driven fire pump shall be provided with a normal source of power as a continually available source.

(B) Arrangement. The normal source of power required in 695.4(A) and its routing shall be arranged in accordance with one of the following:

(1) Service connection dedicated to the fire pump installation.

(2) On-site power production facility connection dedicated to the fire pump installation.

(3) A dedicated feeder connection derived directly from the dedicated service disconnecting means to the fire pump installation.

(4) A feeder connection where all of the following conditions are met:

a. The protected facility is part of a multi-building campus style arrangement.

b. A back-up source of power is provided from a source independent of the normal source of power.

c. It is impractical to supply the normal source of power through arrangement 695.4(B)(1), 695.4(B)(2), 695.4(B)(3), or 695.4(B)(5).

d. The arrangement is acceptable to the authority having jurisdiction.

e. The overcurrent protection device(s) in each disconnecting means shall be selectively coordinated with any other supply side overcurrent protective device(s).

(5) A dedicated transformer connection directly from the service meeting the requirements of Article 695.6.

(C) Connections. For fire pump installations using the arrangement of 695.4(B)(1), 695.4(B)(2), 695.4(B)(3), 695.4(B)(5), 695.4(B)(5) or 695.4(B)(5), the feeder shall be installed in the power supply to the fire pump controller.

(D) Disconnecting Means. Where the disconnecting means permitted by 695.4(C) is installed, the disconnecting means shall meet all of the following:

(1) Identified as being suitable for use as service equipment.

(2) Lockable in the closed position.

(3) Located remote from other building disconnecting means.

FPN: This is to avoid the inadvertent simultaneous operation of the building and fire pump disconnect switches.

(4) Located remote from other fire pump source disconnecting means.

FPN: This is to avoid the inadvertent simultaneous operation of the disconnect switches of other fire pumps.

(5) Marked “Fire Pump Disconnecting Means” or an equivalent marking which is at least one inch (25 mm) in height and that can be seen without opening enclosure doors or covers.

(E) Placard. Where the disconnecting means permitted by 695.4(C) is installed, a placard shall be placed adjacent to the fire pump controller stating the location of this disconnect means and the location of any key needed to unlock the disconnect.

(F) Supervision. Where the disconnecting means permitted by 695.4(C) is installed, the disconnect shall be supervised in the closed position by one of the following methods:

(1) Central station, proprietary or remote station signal device

(2) Local signaling service that will cause the sounding of an audible signal at a constantly attended location

(3) Locking the disconnecting means in the closed position.

(4) Sealing of disconnecting means and approved weekly recorded inspections where the disconnecting means are located within fenced enclosures or in buildings under the control of the owner.

(G) Overcurrent Protection. Where the overcurrent protection permitted by 695.4(C) is installed, the overcurrent protection device shall be selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the full-load current of the associated fire pump accessory equipment. The next standard overcurrent device shall be used in accordance with 240.6. The requirement to carry the locked-rotor current indefinitely shall not apply to conductors or devices other than overcurrent devices in the fire pump motor circuit(s).

695.5 Alternate Power.

(A) When Required. Except for an arrangement described in 695.5(C), at least one alternate source of power shall be provided when the height of the structure is beyond the pumping capacity of the fire department apparatus or when required by the AHJ. The alternate source shall, as a minimum, comply with the requirements of this section.

FPN: See Alternate Power, Other Sources in NFPA-20, Standard for the Installation of Stationary Pumps for Fire Protection, for specifics.

(B) Arrangement. The alternate source shall have a normal source of power as a continually available source.

(C) Back-up Pump. An alternate source of power is not required where a back-up engine driven or back-up steam turbine driven fire pump is installed in accordance with this standard.

FPN: See NFPA-20 for requirements of engine driven or steam turbine fire pumps. In either case, operation of the pump is intended to be independent of the source of electrical power.

(D) Alternate Source. When provided, the alternate source of power shall be supplied from one of the following sources:

(1) A generator installed in accordance with 695.9.

(2) One of the sources identified in 695.4(B)(1); 695.4(B)(2); 695.4(B)(3); or 695.4(B)(5) when the power is provided independent of the normal source of power.

(E) Overhead Lines. Where provided, the alternate supply shall be arranged so that the power to the fire pump is not disrupted when overhead lines are de-energized for fire department operations.

695.6 Transformers. When the service or system voltage is different from the utilization voltage of the fire pump motor, transformer(s) protected by disconnecting means and overcurrent protective devices shall be permitted to be installed between the system supply and the fire pump controller in accordance with 230.6(A) and (B), or (C). Only transformers covered in 695.6(C) shall be permitted to supply loads not directly associated with the fire pump system.

FPN: This may apply to low voltage and medium voltage installations as well as when the service is high voltage.

695.7 Power Wiring. Where an electric motor-driven fire pump, it shall be rated at a minimum of 125 percent of the sum of the fire pump motor(s) and pressure maintenance pump(s) motor loads, and 100 percent of the associated fire pump accessory equipment supplied by the transformer.

(B) Overcurrent Protection. The primary overcurrent protective device(s) shall be selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply. Secondary overcurrent protection shall not be provided. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors or devices other than overcurrent devices in the fire pump motor circuit(s).

(C) Source. Where a feeder source is provided in accordance with 695.4(B)(4), transformers supplying the fire pump system shall be permitted to supply other loads. All other loads shall be calculated in accordance with Article 220, including demand factors as applicable.

(1) Size. Transformers rated at a minimum of 125 percent of the sum of the fire pump motor(s) and pressure maintenance pump(s) motor loads, and 100 percent of the remaining load supplied by the transformer.

(2) Overcurrent Protection. The transformer size, the feeder size, and the overcurrent protective device(s) shall be coordinated such that overcurrent protection is provided for the transformer in accordance with 450.3 and for the feeder in accordance with 215.3, and such that the overcurrent protective device(s) is selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s), the pressure maintenance pump motor(s), the full-load current of the associated fire pump accessory equipment, and 100 percent of the remaining loads supplied by the transformer. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors or devices other than overcurrent devices in the fire pump motor circuit(s).

695.7 Power Wiring. Power circuits and wiring methods shall comply with the requirements in 695.7(A) through (H), and as permitted in 230.90(A), Exception No. 4; 230.94, Exception No. 4; 230.95, Exception No. 2; 240.13; 230.208; 240.4(A); and 430.3.

(A) Supply Conduits.

(1) Services and On-Site Power Production Facility. Service conductors and conduits supplied by an on-site power production facility shall be physically remote from any building(s) and shall be installed in accordance with Part III and Part IV of Article 230. Where supply conductors cannot be physically routed outside of buildings, they shall be permitted to be routed through the building(s) where installed in accordance with 230.6(1) or 230.6(2).

(2) Multi-Building Campus Style Complexes. Where a fire pump is wired under the provisions of 695.4(B)(4), all supply conductors on the load side of the service disconnecting means that constitute the normal source of supply to that fire pump shall be physically routed outside a building(s) and shall be installed...
as outside feeder conductors in accordance with Article 225. Where the feeder conductors cannot be physically routed outside of buildings, they shall be permitted to be routed through the building(s) where installed in accordance with 230.6 (1) or 230.6 (2).

Exception to (A) (2): Where there are multiple sources of supply with means for automatic connection from one source to the other, the requirement for routing outside of the building(s) shall apply only to those conductors on the load side of that point automatic connection between sources.

(3) Supervised or On-Site Standby Generator Connections. Fire pump supply conductors on the load side of the disconnecting means and overcurrent device(s) permitted by 695.4 (C) or conductors that connect directly to an on-site generator shall comply with all of the following:
   a. Independent Routing. The conductors shall be kept entirely independent of all other wiring.
   b. Associated Fire Pump Loads. The conductors shall supply only loads that are directly associated with the fire pump system.
   c. Protection from Potential Damage. The conductors shall be protected to resist physical damage, fire, structural failure, or operational accident.
   d. Inside a Building. When routed through a building, the conductors shall be installed using one of the following methods;
      (1) Be encased in a minimum 50 mm (2 in.) of concrete
      (2) Be protected by a fire-rated assembly listed to achieve a minimum fire rating of 2-hour and dedicated to the fire pump circuit.
      (3) Be a listed electrical circuit protective system with a minimum 2-hour fire rating
      FPN: UL guide information for electrical circuit protective systems (FHIT) contains information on proper installation requirements to maintain fire rating. Exception: Supply conductors located in the electrical equipment room where they originate and in the fire pump room shall not be required to have the minimum 1-hour fire separation or fire resistance rating, unless otherwise required by 700.9(D)(2) of this Code.

(B) Conductor Size.

(1) Fire Pump Motors and Other Equipment. Conductors supplying a fire pump motor(s), pressure maintenance pumps, and associated fire pump accessory equipment shall have a rating not less than 125 percent of the sum of the fire pump motor(s) and pressure maintenance motor(s) full-load current(s), and 100 percent of the associated fire pump accessory equipment.

(2) Fire Pump Motors Only. Conductors supplying only a fire pump motor shall have a minimum ampacity in accordance with 430.22 and shall comply with the voltage drop requirements in 695.8.

(C) Overload Protection. Power circuits shall not have automatic protection against overloads. Except for protection of transformer primaries provided in 695.6(C)(2), branch-circuit and feeder conductors shall be protected against short circuit only. Where a tap is made to supply a fire pump, the wiring shall be treated as service conductors in accordance with 230.6. The applicable distance and size restrictions in 240.21 shall not apply.

Exception No. 2: For on-site standby generator rated to produce continuous current in excess of 225 percent of the full-load amperes of the fire pump motor, the conductors between the on-site generator(s) and the combination fire pump transfer switch controller or separately mounted transfer switch shall be installed in accordance with 695.7(A)(3)(d).

The protection provided shall be in accordance with the short-circuit current rating of the combination fire pump transfer switch controller or separately mounted transfer switch.

(D) Pump Wiring. All wiring from the controllers to the pump motors shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit Type LFNC-B, listed Type MC cable with an impervious covering, or Type MI cable.

(E) Where wire connectors are used in the fire pump circuit, the connectors shall be listed. A fire pump controller or fire pump power transfer switch, where provided, shall not serve any other loads than the fire pump for which it is intended.

(F) Mechanical Protection. All wiring from engine controllers and batteries shall be protected against physical damage and shall be installed in accordance with the controller and engine manufacturer’s instructions.

(G) Ground Fault Protection of Equipment. Ground fault protection of equipment shall not be permitted for fire pump accessories.

(H) Onsite Standby Generator Disconnecting Means. Where the power source is supplied by on-site generator(s), the supply conductors shall connect to a generator disconnecting means dedicated for the purpose of serving the fire pump. The disconnecting means shall be located in a separate enclosure from other generator disconnecting means.

695.8 Voltage Drop.

(A) Starting Voltage Drop. The voltage at the controller line terminals shall not drop more than 15 percent below normal (controller-rated voltage) under motor starting conditions.

(B) Mechanical Operator. The requirements of 695.8(A) shall not apply to emergency-run mechanical starting.

(C) Running Voltage Drop. The voltage at the motor terminals shall not drop more than 5 percent below the voltage rating of the motor when the motor is operating at 115 percent of the full-load current rating of the motor.

695.9 On-Site Standby Generator Systems.

(A) Capacity.

(1) Where on-site generator systems are used to supply power to fire pump motors to meet the requirements of 695.5(B), they shall be of sufficient capacity to allow normal starting and rung of the motor(s) driving the fire pump(s) while supplying all other simultaneously operated load(s) while meeting the requirements of 695.8.

(2) A tap ahead of the on-site generator disconnecting means shall not be required.

(B) Power Sources.

The power sources shall comply with 695.8 and shall meet the requirements of Level 1, Type 10 emergency power systems.

FPN: Type 10 systems are required to make emergency power available in 10 or less seconds. See NFPA-110 Standard for Emergency and Standby Power Systems for definition of Level 1 Emergency Power System. See NFPA-20 for fuel capacity requirements.

(C) Sequencing. Automatic sequencing of the fire pumps shall be permitted as a means of meeting the voltage drop requirements of 695.8.

(D) Transfer of Power. Transfer of power to the fire pump controller between the normal supply and one alternate supply shall take place within the pump room.

(E) Protective Devices. Where protective devices are installed in the on-site power source circuits at the generator, such devices shall allow instantaneous pickup of the full pump room load.

FPN: This is to prevent any Generator Protective Devices from tripping when the fire pump is operating. The generator will continue to supply the pump until pickup of the full pump room load, including the starting any and all connected fire pumps in the across-the-line (direct on line) voltage starting mode. This is always the case when the fire pump(s) is running by use of the Emergency Mechanical Operator of the fire pump controller(s). (See NFPA-20 9.6 On-Site Standby Generator Systems.)

695.10 Junction Boxes. Where fire pump wiring to or from a fire pump controller is routed through a junction box, the following requirements shall be met.

(A) Mounting. The junction box shall be securely mounted.

(B) Controller Enclosure Integrity. Mounting and installing of a junction box shall not violate the enclosure type (NEMA) rating of the fire pump controller(s).

(C) Controller Short Circuit Rating Integrity. Mounting and installing of a junction box shall not violate the integrity of the fire pump controller(s) and shall not affect the short-circuit rating of the controller(s).

(D) Type Rating. As a minimum, a Type 2, drip proof enclosure (junction box) shall be used. The enclosure shall be listed for the subject to match the fire pump controller enclosure Type rating. FPN See Article 430.91 Motor Controller Enclosure Types for further information. See UL-250, Standard for Enclosures for Electrical Equipment, for requirements.

(E) Terminals. Terminals, junction blocks, splices, and the like, when used, shall be of a type listed.

695.11 Listed Electrical Circuit Protective System to Controller Wiring.

(A) Single Conductors. Where single conductors (individual conductors) are used, they shall be terminated in a separate junction box and in accordance with this code.

FPN This is to avoid violating the enclosure type rating, and/or the controller short-circuit (withstand) rating. See also 300.20 and Article 322.

(B) Single conductors (individual conductors) shall not enter the fire pump enclosure separately.

(C) Smoke Seal. Where required by the listing of the electrical circuit protective system, the raceway between a junction box and the fire pump controller shall be sealed at the junction box end as required and per the instructions of the manufacturer or listing agency.

FPN When so required, this seal is to prevent flammable gases from entering into the fire pump controller.

D) Standby wiring between junction box and controller is acceptable.

695.12 Raceway Terminations.

(A) Hubs. Listed conduit hubs shall be used to terminate raceway (conduit) to the fire pump controller.

(B) Type Rating. The NEMA Type rating of the conduit hub(s) shall be at least equal to that of the fire pump controller.

(C) Installation. The installation instructions of the manufacturer of the fire pump controller shall be followed.

(D) Controller Alterations. No alterations to the fire pump controller, other than conduit entry as allowed by this code, shall be made without the approval of the authority having jurisdiction.

695.13 Listed Equipment. Diesel engine fire pump controllers, electric fire pump controllers, electric motors, fire pump power transfer switches, foam pump controllers, and limited service controllers shall be listed for fire pump service. (NFPA 20:9.5.1.1, 10.1.2.1, 12.1.3.1)
695.14 Equipment Location.  
(A) Controllers and Transfer Switches. Electric motor-driven fire pump controllers and power transfer switches shall be located as close as practicable to, and within sight of, the motors that they control.  
(B) Engine-Drive Controllers. Engine-drive fire pump controllers shall be located as close as is practical to, and within sight of, the engines that they control.  
(C) Storage Batteries. Storage batteries for fire pump engine drives shall be supported above the floor, secured against displacement, and located where they are not subject to physical damage, flooding with water, excessive temperature, or excessive vibration.  
(D) Energized Equipment. All energized equipment parts shall be located at least 300 mm (12 in.) above the floor level.  
(E) Protection Against Pump Water. Fire pump controllers and power transfer switches shall be located or protected so that they are not damaged by water escaping from pumps or pump connections.  
(F) Mounting. All fire pump control equipment shall be mounted in a substantial manner on noncombustible supporting structures.  
695.15 Control Wiring.  
(A) Control Circuit Failures. External control circuits that extend outside the fire pump room shall be arranged so that failure of any external circuit (open or short circuit) shall not prevent the operation of a pump(s) from all other internal or external means. Breakage, disconnecting, shorting or opening of the wires, or loss of power to these circuits could cause continuous running of the fire pump but shall not prevent the controller(s) from starting the fire pump(s) due to causes other than these external control circuits. All control conductors within the fire pump room that are not fault tolerant shall be protected against physical damage. [NFPA 20:10.5.2.6, 12.5.2.5]  
(B) Supervision. No undervoltage, phase-loss, frequency-sensitive, or other sensor(s) shall be installed that automatically or manually prohibit actuation of the motor contactor. [NFPA 20:10.4.5.6]  
Exception: A phase loss sensor(s) shall be permitted only as a part of a listed fire pump controller.  
(C) Remote Device(s). No remote device(s) shall be installed that will prevent automatic operation of the transfer switch. [NFPA 20:10.8.1.3]  
(D) Engine-Drive Control Wiring. All wiring between the controller and the diesel engine shall be stranded and sized to continuously carry the charging or control currents as required by the controller manufacturer. Such wiring shall be protected against physical damage. Controller manufacturer’s specifications for distance and wire size shall be followed. [NFPA 20:12.3.5.1]  
(E) Electric Fire Pump Control Wiring Methods. All electric motor-driven fire pump control wiring shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit Type BF (RLNC-B), listed Type MC cable with an impervious covering, or Type MI cable.  
(F) Generator Control Wiring Methods. Control conductors installed between the fire pump power transfer switch and the standby generator supplying the fire pump during normal power loss shall be kept entirely independent of all other wiring. They shall be protected to resist potential damage by fire or structural failure. They shall be permitted to be routed through a building(s) encased in 50 mm (2 in.) of concrete or within enclosed construction dedicated to the fire pump circuits and having a minimum 1-hour fire resistance rating, or circuit protective system with a minimum of 1-hour fire resistance. The installation shall comply with any restrictions provided in the listing of the electrical circuit protective system used.  
Substantiation: The recommended text is based upon the TCC write-up in the A2007 ROP.  
Revisions are also per the NEMA Explanation of Negative Vote Comments printed in the NEC ROP.  
Revisions are also per R. Swayne’s Explanation as follows:  
Revisions to the ROP Version of Article 695 for the 2008 Edition of NFPA-70  
ARTICLE 695 Fire Pumps  
Responses to Explanations of Negative Vote Comments  
NEMA C & S Revisions:  
NASBY, J. NEMA disagrees with the rewrite outlined in this proposal. The arrangement of the material introduces new confusion to an Article that was already not clear in its intent. In addition, the revision adds material that is in NFPA 20 and should remain in NFPA 20. The responsibility of the NEC is for the installation requirements for the fire pump. Design requirements related to performance should not be moved to the NEC. An example of this problem is in proposed 695.5(A) to require an alternate source when the pumping capacity is below a specified apparatus. The use of the word “shall” to indicate an installation requirement, but is information that should remain in NFPA 20 only.  
-- Text of 695.5(A) revised. Also, Fine Print Note (FPN) added to 695.5(A) and 695.5(C). Also corrected some missed spelling and typo. errors.  
In addition, the revisions add a number of fine print Notes that are unacceptable and in violation of the NEC Style Manual. Examples of these notes include:  
1. 695.4(D)(3) FPN – Contains a recommendation -- Done.  
2. 695.4(D)(4) FPN – Contains a recommendation -- Done.  
3. 695.3(B) FPN – Contains recommendations as well as an attempted interpretation of the requirement -- Done.  
4. 695.9(B) FPN – Contains recommendations -- Done.  
5. 695.11(E) FPN – Deals with warranty issues and is inappropriate in the NEC and in a FPN -- Done.  
Other technical issues include (but are not limited to):  
1. 695.6(I) – does not recognize installations where large generator sets are paralleled and supplied switchboards or switchgear. This is contrary to typical installation where a remote disconnect is applied at the normal source of supply and then supplies the transfer switch. -- Correct.  
2. 695.4(C) – limits the installation to one disconnect between the source and the controller. Should a transfer switch be installed ahead of the controller, another disconnect would not be required. -- Correct.  
Also noted. This is the purpose of Article 695. The purpose is not to replicate NEC and in a FPN  -- Done.  
Other requirements that are inappropriate for the NEC include:  
1. 695.9(A)(1) – a direct mandatory reference to NFPA 110, which is prohibited by the NEC Style Manual -- Done.  
2. 695.9(B)(2) – requirements for fuel supply capacity for a generator which is not an NEC installation issue -- Done.  
3. 695.10(D) – A mandatory reference to NEMA Type 2 – which is reference to another standard that is prohibited by the NEC Style Manual -- Done.  
4. 695.12(D) – is in conflict with the provisions of 90.4 -- Done.  
Wording was incorrect.  
5. 695.3(C) – this material is redundant with 90.3 -- Clause isn’t redundant with 90.3. This clause is for inspection and enforcement agencies to prevent installation materials and equipment not complying with standard. This is important for both low voltage and medium voltage installations since auxiliary and ancillary equipment is often installed in the power path or signal paths. Said equipment varies widely. The complete concept of this revision needs to be addressed in the comment phase with the objective of keeping Article 695 limited to installation requirements necessary for the application of the NEC -- Done.  
Swayne Rejection Text:  
Swayne, R. This proposal should be rejected for many reasons. NFPA 20 has its place and Article 695 has its place, they should not become one. The Scope of Article 695 limited to installation requirements necessary for the fire pump system. The Scope of NFPA 20 covers minimum performance and testing requirements of the sources and the transfer switch. NFPA 20 also establishes minimum performance and testing requirements for fire pump control systems. The mutual exclusivity of the NFPA 20 and the NEC is a problem. The NEC and the NFPA 20 are separate documents, each having its own provisions for installation, inspection, and testing. The NEC and the NFPA 20 are separate documents, each having its own provisions for installation, inspection, and testing. The NEC and the NFPA 20 are separate documents, each having its own provisions for installation, inspection, and testing.
As examples of where the proposed action is deficient:

1) Section 695.3(G) prohibits phase converters which was not accepted by NFPA 20 as documented in the substantiation to Proposal 13-81. See Negative Commentary on Proposal 13-81. -- See the somewhat confusing history of this topic in NFPA-20 copied below. At this time, Phase Converters are not allowed by the NFPA-20 Technical Committee.

5) Section 695.5(A) is a new requirement that may be enforced by the Fire Marshal, but not by the electrical AHJ. Noted. Clause revised.

6) Section 695.5(B) requires an alternate source when the normal source is not reliable without defining "reliable." "Reliable" is not defined in Article 100 and the attempt to define it by the unenforceable FPN is confusing. Noted. Clause modified.

7) Section 695.5(B), FPN No. 4 refers to conditions that are not permitted. This may signal the installer that it may not be permitted, but you can do it anyway if you provide an alternate source. This sends the wrong signal. Noted. FPN deleted.

8) Editorialy, "when" should be replaced by "where" in several locations to meet the Style Manual. -- Noted. I'm asking for direction from NFPA staff I'm trying to minimize differences in extracted text compared to the source document.

4) Section 695.4(B)(5) requires an alternate source when the normal source is not reliable. This is important normal inspection of fire pumps or sprinkler systems. It applies directly to sprinkler systems, this clause is separate and does not fall in the realm of the campus style method of 695.4(B)(4). It also applies service at low building or structure. -- Although placed last, this clause, 695.4(B)(5) does not relate to the campus style method of 695.4(B)(4). Although this clause applies to low building or structure, it is not constantly producing power.

5) Section 695.4(B)(5) refers to "service" whereas the facility does not have a "service" here means the campus service equipment, such as double ended switchgear (main-tie-main). A FPN may be in order to help clarify since the campus distribution, while typically medium voltage, is also typically down stream of transformers, and where the primary side, the secondary side, or both may be arranged as double ended.

6) Section 695.5(B) requires an alternate source when the normal source is not reliable. This may signal the installer that it may not be permitted, but you can do it anyway if you provide an alternate source. This sends the wrong signal. Noted. FPN deleted.

7) Section 695.5(B), FPN No. 4 refers to conditions that are not permitted. This may signal the installer that it may not be permitted, but you can do it anyway if you provide an alternate source. This sends the wrong signal. Noted. FPN deleted.

8) Editorialy, "when" should be replaced by "where" in several locations to meet the Style Manual. -- Noted. I'm asking for direction from NFPA staff I'm trying to minimize differences in extracted text compared to the source document.

Panel Meeting Action: Accept in Principle in Part

Revise Article 695 to read as follows:

ARTICLE 695 Fire Pumps

FPN: Rules that are followed by a reference in brackets contain text that has been extracted from NFPA 20-2007, Standard for the Installation of Stationary Pumps for Fire Protection. Only editorial changes were made to the extracted text to make it consistent with this Code.

695.1 Scope

(A) Covered. This article covers the installation of the following:

(1) Electric power sources and interconnecting circuits

(2) Switching and control equipment dedicated to fire pump drivers

(3) Associated fire pump accessory equipment, which includes wiring and overcurrent protection of other loads connected to the power supply.

(B) Not Covered. This article does not cover the following:

(1) The performance, maintenance, and acceptance testing of the fire pump system, and the internal wiring of the components of the system

(2) Pressure maintenance (jockey or makeup) pumps


695.2 Definitions.

Fault Tolerant External Control Circuits. Those control circuits either entering or leaving the fire pump controller enclosure, which if broken, disconnected or shorted will not prevent the fire pump from starting, from any all internal or external means and may cause the controller to start the pump under these conditions.

On-Site Power Production Facility. The normal supply of electric power for the site that is expected to be constantly produced power. On-Site Standby Generator. Electric power on site as the alternate supply of electric power. It differs from an on-site power production facility, in that it is not constantly producing power.

695.3 Power Source(s) for Electric Motor-Driven Fire Pumps.

Electric motor-driven fire pumps shall have a reliable source of power.

FPN: NFPA 20-2007, Standard for the Installation of Stationary Pumps for Fire Protection, covers characteristics of reliable sources. Also see the cross-reference table in Annex J.

(A) Individual Sources. Where reliable, and where capable of carrying indefinitely the linked locked rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply, the power source for an electric motor-driven fire pump shall be one or more of the following.

(1) Electric Utility Service Connection. A fire pump shall be permitted to be supplied by a separate service, or from a connection located ahead of and not within the same cabinet, enclosure, or vertical switchboard section as the service disconnecting means. The connection shall be located and arranged so as to minimize the possibility of damage by fire from within the premises and from sources of hazards. A tap ahead of the service disconnecting means shall comply with 230.82(S). The service equipment shall comply with the labeling requirements in 230.2 and the location requirements in 230.72(B). [NFPA 20.9.2.2]

(2) On-Site Power Production Facility. A fire pump shall be permitted to be supplied by an on-site power production facility. The source facility shall be located and protected to minimize the possibility of damage by fire. [NFPA 20.9.2.3]
(3) Dedicated Feeder. A dedicated feeder shall be permitted where it is derived from a service connection as described in 695.3(A)(1).

(B) Multiple Sources. Where reliable power cannot be obtained from a source described in (A) of this paragraph, protective devices described in 695.3(D) or from an approved connection of two or more sources as covered in 695.3(B)(2), or from an approved connection of one or more of these sources in combination with an on-site standby generator comply with 695.3(D), or from an approved combination of feeders consisting of two or more power sources as covered in 695.3(B)(2), or from an approved combination of one or more of these power sources in combination with an on-site standby generator as described in 695.3(B).

(1) Two Individual Sources. An approved connection of two or more of these sources as covered in 695.3(A)(1) and 695.4(B)(2) through (6)

(C) Multibuilding Campus-Style Complexes. Where the sources in 695.3(A)(3) are not practicable and the installation is part of a multibuilding campus style complex, feeder sources shall be permitted where approved by the authority having jurisdiction in accordance with (1) or (2).

(1) Two Feeder Sources. Two feeders shall be permitted as one power source where such feeders are connected to or derived from separate utility services. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B).

(2) Feeder and Alternate Source. A feeder shall be permitted as a normal source of power when an alternate source of power independent from the feeder is provided. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B).

(3) Generator Capacity. An on-site generator(s) used to comply with this section shall be of sufficient capacity to allow normal starting and running of the motor(s) driving the fire pump(s) while supplying all other simultaneously operated connected automatic shutoff fire pump controller and overcurrent protective devices. Automatic shutoff fire pump controller and overcurrent protective devices in the fire pump motor circuit(s) locked-rotor currents indefinitely shall not apply to conductors or devices other than the fire pump motor(s). Overcurrent protective device(s) shall be selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors or devices other than overcurrent devices in the fire pump motor circuit(s).

(4) Disconnecting Means. The disconnecting means shall comply with all the following:

(1) Identified as suitable for use as service equipment.

(2) Lockable in the closed position.

(3) Located remote from other building disconnecting means.

(4) Sealing of disconnecting means and approved weekly recorded inspections where the disconnecting means are located within fenced enclosures or in buildings under the control of the owner.

(C) Connections. For fire pump installations using the arrangement of 695.3(A) and 695.4(B)(2), (3) and (5), for the normal source of power, no more than one disconnecting means and associated overcurrent protective device shall be installed in the power supply to the fire pump controller.

(4) Connecting Means. Where the connecting means permitted by 695.4(C) is installed, the disconnecting means shall meet all of the following:

(1) Identified as being suitable for use as service equipment.

(2) Lockable in the closed position.

(3) Located remote from other building disconnecting means.

(5) Local signaling service that will cause the sounding of an audible signal at a constantly attended point.

(6) Supervision. Where the disconnecting means permitted by 695.4(C) is installed, the disconnect shall be supervised in the closed position by one of the following methods:

(a) Central station, proprietary or remote station signal device.

(b) Local signaling service that causes the sounding of an audible signal at a constantly attended point.

(7) Locking the disconnecting means in the closed position.

(C) Connections. For fire pump installations using the arrangement of 695.3(A) and 695.4(B)(2), (3) and (5), for the normal source of power, no more than one disconnecting means and associated overcurrent protective device shall be installed in the power supply to the fire pump controller.

(4) Connecting Means. Where the connecting means permitted by 695.4(C) is installed, the disconnecting means shall meet all of the following:

(1) Identified as being suitable for use as service equipment.

(2) Lockable in the closed position.

(3) Located remote from other building disconnecting means.

(4) Sealing of disconnecting means and approved weekly recorded inspections where the disconnecting means are located within fenced enclosures or in buildings under the control of the owner.

(5) Local signaling service that will cause the sounding of an audible signal at a constantly attended point.

(6) Supervision. Where the disconnecting means permitted by 695.4(C) is installed, the disconnect shall be supervised in the closed position by one of the following methods:

(b) Local signaling service that causes the sounding of an audible signal at a constantly attended point.

(7) Locking the disconnecting means in the closed position.

(C) Connections. For fire pump installations using the arrangement of 695.3(A) and 695.4(B)(2), (3) and (5), for the normal source of power, no more than one disconnecting means and associated overcurrent protective device shall be installed in the power supply to the fire pump controller.
shall be selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment, and 100 percent of the remaining loads supplied by the transformer. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors or devices other than overcurrent devices in the fire pump motor circuit(s).

695.6 Power Wiring.

Power circuits and wiring methods shall comply with the requirements in 695.6(A) through (H), and as permitted in 230.90(A), Exception No. 4, 230.94, Exception No. 4, 230.95, Exception No. 2, 240.18, 250.208, 240.4(A), and 450.31.

(A) Service Supply Conductors. Supply conductors shall be physically routed outside a building(s) and shall be installed as service entrance conductors or as service circuit conductors. Where supply entrance conductors are physically routed outside buildings, they shall be permitted to be routed through buildings where installed in accordance with 230.69(1) or 230.69(2). Where a fire pump is wired under the provisions of 695.6(B)(2), this requirement shall apply to all supply conductors that connect the transformer to the fire pump controller or separately mounted fire pump control power circuit, the connectors shall be listed. A fire pump controller and fire pump power transfer switch, where provided, shall not be used as a junction box to supply other equipment, including a pressure maintenance (jockey) pump(s).

(B) Service Conductors. Service conductors and conductors supplied by an on-site power production facility shall be physically routed outside a building(s) and shall be installed as service entrance conductors or service circuit conductors. Where supply entrance conductors are physically routed outside buildings, they shall be permitted to be routed through buildings where installed in accordance with 230.69(1) or 230.69(2). Where a fire pump is wired under the provisions of 695.6(B)(2), this requirement shall apply to all supply conductors that connect the transformer to the fire pump controller or separately mounted fire pump control power circuit, the connectors shall be listed. A fire pump controller and fire pump power transfer switch, where provided, shall not be used as a junction box to supply other equipment, including a pressure maintenance (jockey) pump(s).

(C) Overload Protection. Power circuits shall not have automatic protection against overloads. Except for protection of transformer primaries provided in 695.5(C)(2), branch-circuit and feeder conductors shall be protected against short-circuit and ground fault conditions.

(D) Pump Wiring. All wiring from the controllers to the pump motors shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit Type LFNC-B, listed Type MC cable with an impervious covering, or Type MI cable.

(E) Junction Points. Where wire connectors are used in the fire pump circuit, the connectors shall be listed. A fire pump controller or fire pump power transfer switch, where provided, shall not be used as a junction box to supply other equipment, including a pressure maintenance (jockey) pump(s).

(F) Ground Fault Protection of Equipment. Ground fault protection of equipment shall not be permitted for fire pumps.

(G) Fire Pump Standby Generation and Disconnecting Means.

Where the service source is provided by on-site generation(s), the supply conductors shall connect to a generator disconnecting means dedicated for the purpose of serving the fire pump. The disconnecting means shall be located in a separate enclosure from other generator disconnecting means.

695.7 Voltage Drop.

The voltage at the controller line terminals shall not drop more than 15 percent below normal (controller-rated voltage) under motor starting conditions. The voltage at any motor input terminals shall not be permitted to drop more than 5 percent below the voltage rating of the motor when the motor is operating at 115 percent of the full-load current rating of the motor.

695.10 Listed Equipment.

Diesel engine fire pump controllers, electric fire pump controllers, electric motors, fire pump power transfer switches, foam pump controllers, and limited severity disconnecting means shall be listed for fire pump service.

695.11 Listed Electrical Circuit Protective System to Controller Wiring.

(A) Simple Conductors. Where simple conductors (individual conductors) are used, they shall be terminated in a separate junction box in accordance with this Code.

FPN This is to avoid violating the enclosure-type rating and/or the controller short-circuit withstand rating. See also 300.20 and Article 322.

(B) Single Conductors. Where simple conductors (individual conductors) are used, they shall not enter the fire pump enclosure separately.

(C) Smoke Seal. Where required by the listing of the electrical circuit protective system, the raceway between a junction box and the fire pump controller shall be sealed at the junction box end as required and per the instructions of the manufacturer or listing agency.

FPN: When so required, this seal is to prevent flammable gases from entering the fire pump controller.

(D) Standard Wiring Between Junction Box and Controller.

695.12 Equipment Location.

(A) Controllers and Transfer Switches. Electric motor-driven fire pumps shall be located at the fire pump source, and the fire pump shall be located as close as practicable to, and within sight of, the motors that they control.

(B) Engine-Drive Controllers. Engine-drive fire pump controllers shall be located as close as is practicable to, and within sight of, the engines that they control.

(C) Storage Batteries. Storage batteries for fire pump engine drives shall be supported above the floor, secured against displacement, and located where they are not subject to physical damage, flooding with water, excessive temperature, or excessive vibration.

(D) Energized Equipment. All energized equipment parts shall be located at least 300 mm (12 in.) above the floor level.
(E) Protection Against Pump Water. Fire pump controllers and power transfer switches shall be located or protected so that they are not damaged by water escaping from pumps or pump connections.

(F) Mounting. Fire pump control equipment shall be mounted in a substantial manner on noncombustible supporting structures.

695.14 Control Wiring.

(A) Control Circuit Failures. External control circuits that extend outside the pump room shall be arranged so that the conductor conductive pipe or conduit (open or short circuit) shall not prevent the operation of a pump(s) from all other internal or external means. Breakage, disconnecting, shorting of the wires, or loss of power to these circuits could cause continuous running of the fire pump but shall not prevent the controller(s) from starting the fire pump due to causes other than these external control circuits. All control conductors within the fire pump room that are not fault tolerant shall be protected against physical damage. [NFPA 20:10.5.2.6, 12.5.2.5]

(B) Sensor Failure. No undervoltage, overvoltage, close-loss, frequency-sensitive, or other sensor(s) shall be installed that automatically or manually prohibit actuation of the motor contactor. [NFPA 20:10.4.5.6]

Exception: A phase loss sensor(s) shall be permitted only as a part of a listed fuel capacity requirements.

(C) Remote Device(s). No remote device(s) shall be installed that will prevent automatic operation of the transfer switch. [NFPA 20:10.8.1.3]

(D) Engine-Drive Control Wiring. All wiring between the controller and the diesel engine shall be stranded and sized to continuously carry the charging or fuel capacity requirements as required by the controller manufacturer. Such wiring shall be protected against physical damage. Controller manufacturer's specifications for distance and wire size shall be followed. [NFPA 20:12.5.3.1]

(E) Electric Fire Pump Control Wiring Methods.

(1) Where on-site generator systems are used to supply power to fire pump control wiring shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit Type B (LFNC-B), listed Type MC cable with an impervious covering, or Type MI cable.

(F) Generator Control Wiring Methods. Control conductors installed between the fire pump power transfer switch and the standby generator supplying the fire pump during normal power loss shall be kept entirely independent of any auxiliary wiring. They shall not be protected to reduce fire damage by fire or structural failure. They shall be permitted to be routed through a building(s) encased in 50 mm (2 in.) of concrete or within enclosed construction dedicated to the fire pump circuits and having a minimum 1-hour fire resistance rating. The fire pump controller enclosure shall be labeled as Type 214E, listed for classification, and shall be Type 1 or Type 2, as required by the AHJ. [NFPA 20: 695.16 (B).]

(G) Controller Interlocks. The controller interlocks shall be arranged so that the normal source of power to the fire pump controller(s) is routed through a junction box, the following requirements shall be met.

(A) Mounting. The junction box shall be securely mounted.

(B) Controller Enclosure Integrity. Mounting and installing of a junction box shall not violate the enclosure type (NEMA) rating of the fire pump controller(s).

(C) Controller Short-Circuit Rating Integrity. Mounting and installing of a junction box shall not affect the short-circuit rating of the controller(s).

(D) Type Rating. As a minimum, a Type 2, dripproof enclosure (junction box) shall be used. The enclosure shall be listed for the subject to match the fire pump controller enclosure-type rating.

FPN: See Article 430.91. Motor Controller Enclosure Types for further information. See UL-50, Standard for Enclosures for Electrical Equipment, for requirements.

(E) Terminals. Terminals, junction blocks, splices, and the like, when used, shall be listed.

695.18 Raceway Terminations.

(A) Hubs. Listed conduit hubs shall be used to terminate raceway (conduit) to motor(s) and/or controller(s).

(B) Type Rating. The type rating of the conduit hub(s) shall be at least equal to that of the fire pump controller.

(C) Installation. The installation instructions of the manufacturer of the fire pump controller enclosure-type rating shall be followed.

FPN: See Article 430.91. Motor Controller Enclosure Types for further information. See UL-50, Standard for Enclosures for Electrical Equipment, for requirements.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative: RAPPAPORT, E. The panel action to add NFPA 20 extract material has added numerous new, changed, and deleted sections into Article 695 without documentation. The comment is new material as a result of the TCC rejection of the original proposal. The attempt to integrate this new material into the existing text has resulted in numerous errors and inconsistencies that indicate that the panel action is not in a form to be included in the 2008 NEC. Some examples from the panel actions are as follows:

1) 695.2(A)(3) is new material.
2) 695.3(B)(2) Individual Source and Generator is changed from the previous text without justification.
3) 695.3(D)(4) Phase Converters are prohibited with no justification from NFPA 20.

See Negative vote on Comment 13-117 for evidence.
4) 695.3(E)(1), (2), and (3) is a repeat of 695.3(A)(1), (2) and (3).
5) 695.3(E)(4)(a), (b), and (c) are covered in 695.3(C)(1) and (2).
6) 695.4(A) is a new requirement.
7) There are two 695.4(E)(1) and (2).
8) 695.4 requires compliance with (A) and (B) but there is no tie into (C), (D), and (E).
9) 695.6 refers to service disconnecting means for a multi-building campus whereas there would not be a "service" to the building but a feeder.
10) 695.6(A)(3)(d) requires a 2 hour fire rating for the supply conductors but the exception does not require the 2 hour rating in the fire pump room even though NFPA 20 requires the room to have a 2 hour rating.
11) 695.14 Alternate Power is new text and is a rehash of the requirements in 695.3.
12) 695.16(B) requires compliance with "Level 1, Type 10 emergency power" and no definition other than an FPN note reference to NFPA 110.

The present Comment 13-103 is new material that was not contained in the original proposal, has not had public review, and requires considerable editing.

Comment on Affirmative: FL, NFPA, G: Change "when" to "where" in a few places. Remove "etc."

Change the language in the FPN by removing "required" in the FPN following 695.16(B). References must be corrected in 695.3(E)(4)(C).
TCC Action: It was the action of the Technical Correlating Committee that this comment be reported as “Reject”. The Technical Correlating Committee does not agree with the placement of a cross-reference in the Annex. The objective of the extract identification requirements of the Style Manual make a cross-reference unnecessary.

Submitter: James S. Nasby, Master Control Systems, Inc.

Recommendation: Do not reject the proposal. Revise the table content as shown below:

NFPA 70 Section 695 (Fire Pumps) Extract Material from NFPA 20

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Note: “N/A” - Not Applicable (Not Extract Text).

**Substantiation:** This cross reference table is needed since the revised Manual of Style of NFPA 70 makes it difficult to tell which exact clauses are extract text or not. E.g.: The stars are no longer used. As a result, a number of Public Proposals and Public Comments have been rejected by the Panel for scope which delays NFPA action on said Proposals and Comments until the next cycle of NFPA 20. This has already resulted in five year delays for Final Action on submitted Proposals and Comments. It’s important for prospective submitters of Public Proposals or Public Comments to know where to send them or (Which standard) and/or for NFPA staff to help submitters re-direct said proposals and comments to avoid the cycle delay for consideration and action to occur. Note that this submitter has worked with NFPA staff at length before proposing this cross reference table to NFPA 70 and to take this step to reduce the delays that have occurred. This is the best solution known at this time. Also note that a cross reference table does already exists in NFPA 70 Annex “F”.

**Revised content per the Negative Vote Explanation suggestion of Robert Swayne.**

**Panel Meeting Action:** Accept in Principle

Due to changes made in Comment 13-103, create a new annex, Annex J, “NFPA 70 Article 695 (Fire Pumps) Extract Material From NFPA 20” to read as shown following

**Panel Statement:** CMP-13 desires that a cross-reference table be placed in Annex J and revised per action on Comment 13-103. See panel action and statement on Comment 13-103.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 12 Negative: 1

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.
### NFPA-70 Section 695 (Fire Pumps) Extract Material from NFPA-20

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## NFPA-70 Section 695 (Fire Pumps) Extract Material from NFPA-20

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<td>2) &quot;**&quot; Indicates an Annex Item in NFPA-20.</td>
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13-105 Log #1091 NEC-P13
(695)
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 13-77
Recommendation: This Proposal should remain Rejected.
Substantiation: The TCC was correct to return this proposal back to the panel. It has so many problems introduced by the revision that the panel should not try to salvage any type of significant rewrite during the comment phase. The panel should revisit the individual proposals for Article 695 and review each one based on its merit for inclusion in Article 695. The revision proposed by Proposal 13-77 is completely unacceptable for the NEC.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

(Note: The sequence no. 13-106 was not used)

13-107 Log #1945 NEC-P13
(695)
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Barry F. O’Connell, Tyco Thermal Controls
Comment on Proposal No: 13-77
Recommendation: Continue to Reject.
Substantiation: The material introduces new confusion to an Article that was already confusing, as pointed out in the NEMA negative comment.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

(Note: The sequence no. 13-108 was not used)

13-109 Log #1039 NEC-P13
(695.1(A) and (B))
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-79
Recommendation: Suggested revision:
Replace (3) with “Wiring, Overcurrent Protection and other aspects of loads connected to the power supply or interconnecting circuits.”
Substantiation: Direction of the TCC to clarify panel action. Suggested wording.
The intent is to indicate that there is prescriptive code regarding other connected loads, but, not the loads themselves. Also note that most, but not all, fire pump systems have pressure maintenance (jockey) pumps which may or may not be connected to the fire pump power supply.
Panel Meeting Action: Accept in Principle
695.1 Scope
(A) Covered. This article covers the installation of the following:
1) Electric power sources and interconnecting circuits.
2) Switching and control equipment dedicated to fire pump drivers.
3) Associated fire pump accessory equipment which includes wiring and overcurrent protection of other loads connected to the power supply.
(B) Not Covered. This article does not cover the following:
1) The performance, maintenance, and acceptance testing of the fire pump system, and the internal wiring of the components of the system
2) Performance maintenance (jockey or makeup) pumps.
Panel Statement: A new (3) was added to clarify the panel action on Proposal 13-79 and under the direction of the TCC. The FPN reference document was updated to the latest edition.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.

13-110 Log #1619 NEC-P13
(695.1(A) and (B))
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Joseph C. Warren, Joseph C. Warren Electrical Consulting Services
Comment on Proposal No: 13-79
Recommendation: Revise text to read as follows:
695.1 Scope.
(A) Covered. This article covers the installation of the following:
1) Electric power sources and interconnecting circuits.
2) Switching and control equipment dedicated to fire pump drivers.
3) Pressure maintenance (jockey or makeup) pumps.
4) Associated fire pump accessory equipment for alarms that signal an alarm for improper conditions that exist in a fire pump.
(B) Not Covered. This article does not cover the following:
1) The performance, maintenance, and acceptance testing of the fire pump system, and the internal wiring of the components of the system
2) Pressure maintenance (jockey or makeup) pumps.
Substantiation: We DO need to state that jockey or makeup pump motors are covered because they do exist in fire pump installations. The present language, by not including them, is a very bad format even if we do go to Article 430 for jockey pumps. Accessory equipment also needs to be covered because the alarms that are part of the fire pump installation indicate improper conditions in fire pump equipment if something occurs that is wrong. 695.5(A), (B), and (C)(2) tell us to include jockey and makeup pumps in load calculations.
Panel Meeting Action: Reject
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative:
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.

Comment on Affirmative:
ZGONENA, T.: To clarify the panel action, item (3) was rejected as the requirements for jockey or makeup pump motors are within the scope of Article 430, not Article 695.

13-111 Log #1154 NEC-P13
(695.1(A) and (B))
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-79
Recommendation: Suggest revision:
Replace (3) with “Wiring, Overcurrent Protection and other aspects of loads connected to the power supply or interconnecting circuits.”
Substantiation: Direction of the TCC to clarify panel action. Suggested wording.
The intent is to indicate that there is prescriptive code regarding other connected loads, but, not the loads themselves. Also note that most, but not all, fire pump systems have pressure maintenance (jockey) pumps which may or may not be connected to the fire pump power supply.
Panel Meeting Action: Accept in Principle
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-112 Log #99 NEC-P13
(695.1(A) and (B))
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-79
Recommendation: The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee rejects the Panel Action until the Panel Action has been clarified regarding the deletion of (B)(2) and acceptance of the underlined (4).
The Technical Correlating Committee directs the Panel to clarify the Panel Action relative to the addition of Item 4, associated fire pump accessory equipment, since that equipment appears to be related to mechanical equipment rather than the electrical installation.
This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative: RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.
Comment on Affirmative: ZGONENA, T.: Regarding the TCC comment, the additional item 4 relates to electrical loads and their circuits such as fire pump alarm and signaling devices.

13-113 Log #1136 NEC-P13 Final Action: Accept (695.2)
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-80
Recommendation: Consider adding back the word “either” to agree with NFPA-20.
Note that the phrase “from all other internal or external means” is new to NFPA-20 to agree with the NEC.
Substantiation: To agree with NFPA-20-2007. Note that I should have deleted the above phrase from my Public Proposal 13-80 before sending it.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative: RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.

13-114 Log #100 NEC-P13 Final Action: Hold (695.3)

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-81
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-115 Log #1040 NEC-P13 Final Action: Hold (695.3)

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-82
Recommendation: Continue to Accept in Principle per CMP-13 Panel Action. Do not Reject the proposal.
Substantiation: This proposal does meet the requirements of Section 4-3.3 Regulations Governing Committee Projects since five pages of supporting material were on file with the NFPA as stated in the ROP. This material was part of the proposal material sent to CMP-13 members. This material is essentially identical with the text proposed in Proposal 13-77.
I don’t know why the TCC changed the Panel vote from AIP to Reject. TCC doesn’t state how 4.3.3 is violated.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 13-103.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative: RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.

13-116 Log #1093 NEC-P13 Final Action: Hold (695.3)

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Jim Paulsey, Square D Company
Comment on Proposal No: 13-77
Recommendation: Revise 695.3 from the ROP Draft to read as follows:
695.3 Power Sources (for Electric Motor-Driven Fire Pumps). Electric motor-driven fire pumps shall have a reliable source of power.
(A) Individual Sources. Where reliable, and where capable of carrying indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply, the power source for an electric motor driven fire pump shall be one or more of the following.
(1) Electric Utility Service Connection. A fire pump shall be permitted to be supplied by a separate service, or from a connection located ahead of and not within the same cabinet, enclosure, or vertical switchboard section as the service disconnecting means. The connection shall be arrester or placed so as to minimize the possibility of damage by fire from within the premises and from exposing hazards. A tap ahead of the service disconnecting means shall comply with 230.82(5). The service equipment shall comply with the labeling requirements in 230.2 and the location requirements in 230.72(B). [NFPA 20:9.2.2]
(2) On-Site Power Production Facility. A fire pump shall be permitted to be supplied by an on-site power production facility. The service facility shall be located and protected to minimize the possibility of damage by fire. [NFPA 20:9.2.3]
(3) Dedicated Feeder. A dedicated feeder shall be permitted where it is derived from a service connection as described in 695.3(A)(1).
(B) Multiple Sources. Where reliable power cannot be obtained from a source described in 695.3(A), power shall be supplied one of the following:
(1) Two Individual Sources. Where two approved combinations of two or more of either of such sources the sources from 695.3(A).
(2) Individual Source and Generator. An approved combination of one or more of the sources in 695.3(A) and an on-site generator complying with 695.3(D), or from an approved combination of feeders containing two or more power sources as power sources as one power source where one source is not dedicated. The connection shall be of one or more of such power sources in combination with an on-site standby generator complying with 695.3(D)(1) and (D)(2).
(C) Multibuilding Campus-Style Complexes. Where the sources in 695.3(A) are not practicable and the installation is part of a multibuilding campus-style complex, feeder(s) shall be permitted where approved by the authority having jurisdiction and installed in accordance with (1) or (2).
(1) Two Feeder Sources. Two feeders shall be permitted as more than one power source where such feeders are connected to or derived from separate utility services. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B).
(2) Feeder and Alternate Source. A feeder shall be permitted as a normal source of power when an alternate source of power independent of the feeder is provided. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B).

1. Gustafson, R.
3. 695.3(B) is rearranged to create a list of the two provisions dealing with combinations of sources. Item 1 captures the combination of two of the sources recognized in 695.3(A). Item 2 captures the basic combination of a 695.3(A) source and an on-site generator. The provisions for the generator are moved to create a new 695.3(D), so that reference is given here. These two provisions of this list are recognized in the current text of 695.3(B).

4. 695.3(C) is a new section to cover the multi-building campus installations with more clarity. The intro paragraph captures the three requirements in the present text that the sources in 695.3(A) are not practicable, that the AHJ approves the use of the feeder source and that you have a multi-building campus application. The paragraph then allows either of two options to be used a. Item (1) covers the application of two feeder sources. This provision is already allowed in the current 695.3(B) and recognizes that you can utilize two feeders from separate utility services as more than one power source. The provision that any disconnects and overcurrent devices comply with 695.4(B) is captured.

   b. Item (2) will recognize a feeder along with an alternate source. This provision was accepted by the panel in Proposal 13-77 as section 695.4(B)(4). This addition will eliminate the need for the feeder controller. It should be noted that the text maintains the panel accepted text from Proposal 13-77 of “alternate power source independent of the feeder” instead of referencing an on-site generator specifically.

5. The “Generator Capacity” section is moved from 695.3(B)(1) to become 695.3(D). This section is also editorially rearranged to break the three requirements of the generator into three sections titled “Capacity”, “Connection” and “Adjacent Disconnects”.

   695.3(E) is the old 695.3(B)(3) regarding arrangement of the power sources. This placement will allow it to apply to the multiple sources of both (B) and (C).

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 13-103.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative: RAPPAPORT, E.: See my explanation of negative vote on Comment 13-103.

13-117 Log #1137 NEC-P13
Final Action: Hold
(695.3)

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-81
Recommendation: Continue to Accept the Proposal to prohibit phase converters.
Substantiation: Phase converters are prohibited by NFPA-20. My substantiation is confusing; but, the NFPA-20 Technical Committee via action on Proposal 20-71 (Log #59) and on Comments 20-8 (Log #38) and 20-42 Log #37 prohibits phase converters as unsuitable for fire pump service. One reason is imbalances that occur with varying loads. Another is adding another energy converter in the critical path. Another problem is keeping the controller energized at all times.
This is consistent with Panel Action on Proposal 13-77 and also with my Comment suggesting revisions to 13-77.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative: RAPPAPORT, E.: The substantiation for prohibiting phase converters for fire pump service is erroneous and misleading. None of the NFPA 20 proposals cited in the substantiation prohibit phase converters. NFPA 20 Proposal 20-71 is a request that phase converters be either permitted or prohibited in the text. This proposal was REJECTED. NFPA 20 Proposal 20-8 provided specific wording to prohibit phase converters and the committee action was to refer to the action on Proposal 20-42. NFPA 20 Proposal 20-42, which was accepted, added a note (now in the Annex (not enforceable) indicating that phase converters are not recommended for fire pump motors. The note left it open for the AHJ to determine the reliability of the electric supply.
There does not appear to be any substantiation to prohibit the use of phase converters. It should be left up to the AHJ since phase converter operation may be the best alternative to provide fire protection where three phase power is not available. If phase converters are to be prohibited, it should be done by NFPA 20 and they have, at present, declined to do so.

(Note: The sequence no. 13-118 was not used)

13-119 Log #101 NEC-P13
Final Action: Hold
(695.3, FPN (New))

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: National Electrical Code
Comment on Proposal No: 13-83
Recommendation: It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Technical Correlating Committee action on Proposal 13-77. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-120 Log #1138 NEC-P13
Final Action: Hold
(695.3, FPN (New))

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-83
Recommendation: Continue to Accept in Principle Public Proposal 13-83.
Substantiation: At the risk of a small amount of redundancy, this reference back to NFPA-20 on characteristics of a “reliable power source” is vital and a source of daily confusion and conflicts. The intent is to aid plan approval and inspection agencies and other AHJs in resolving conflicts. Note that the submitter of Proposal 13-81, F. Hartwell, is both an AHJ and is also very familiar with fire pump installations; but, is seeking this additional guidance. This is also important since NFPA-70 has far wider distribution than NFPA-20. Hopefully, this reference will lead readers to NFPA-20 clause A.9.3.2 which has several paragraphs of guidance on this topic.
Panel Meeting Action: Reject
Panel Statement: A fine print note is available and presently exists above the scope of Article 695.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-121 Log #1139 NEC-P13
Final Action: Hold
(695.3(A)(3))

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-84
Recommendation: Continue to Reject this proposal.
Substantiation: This is extract text from NFPA-20. The proposal should go to the NFPA-20 Technical Committee.
Five methods are now allowed for supplying fire pump controllers. Included is the transformer connection which can be and is used at low voltage, medium voltage and high voltage.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative: ELKINS, D.: The panel action on these comments ignores the needs of large industrial concerns who purchase power at a high voltage where a second disconnect and transformer for a fire pump service is impractical. Large industrial concerns who purchase power at a high voltage where a second disconnect and transformer for a fire pump service is impractical. Large industrial concerns who purchase power at a high voltage are familiar with fire pump installations; but, is seeking this additional guidance. This is also important since NFPA-70 has far wider distribution than NFPA-20. Hopefully, this reference will lead readers to NFPA-20 clause A.9.3.2 which has several paragraphs of guidance on this topic.
Panel Meeting Action: Reject
Panel Statement: A fine print note is available and presently exists above the scope of Article 695.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-122 Log #1140 NEC-P13
Final Action: Hold
(695.3(A)(3))

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-85
Recommendation: Continue to Reject this proposal.
Substantiation: This is extract text from NFPA-20. The proposal should go to the NFPA-20 Technical Committee.
Five methods are now allowed for supplying fire pump controllers. Included is the transformer connection which can be and is used at low voltage, medium voltage and high voltage.
The issue of deviation being justified by a redundant pump is proper matter for the AHJ and the specific installation.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 11 Negative: 2
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See My Explanation of Negative on Comment 13-121.
RAPPAポート, E.: The proposal is correct and is contained in NFPA 20-9.3.3. It is desirable to have this exemption in NFPA 70 so that an AHJ will not require alternate power if a redundant diesel fire pump is installed.

Final Action: Hold
13-123 Log #1866 NEC-P13 (695.3(A)(3) (New )

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 13-84
Recommendation: Add text to read as follows:
695.3(A)(3) In industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified persons service the installation, a fire pump controller shall be permitted to be supplied power by a single feeder from disconnect dedicated to the fire water pump in a site-wide power distribution system located sufficiently remote from the facilities served, to minimize the possibility of damage to the fire pump service by fire from within the facilities.

Substantiation: This comment modifies the original proposal to address comments concerning security, segregation and safety of the feeder to the fire pump controller during a fire. The intent of this change is to address the needs of large industrial concerns which purchase power at a high voltage where a second disconnect and transformer for a fire pump service as required 695.3(A)(1) is impractical while still maintaining the ability of the fire fighters to quickly isolate power to the facility on fire while retaining a power supply to the fire pumps. This proposal permits these large industrial concerns to provide service to fire water pumps which is identical physically to that used by concerns which purchase power at a medium voltage. This modified proposal adds the requirement that the service be separate from the disconnect for power to the facilities and is sufficiently remote from the facilities to not be at risk of damage by the fire. Since power purchased at higher voltage is generally more reliable and the additional high voltage disconnect and transformer are not required, this installation is actually more reliable than what is permitted.

Panel Meeting Action: Reject
Panel Statement: The submitter does not provide sufficient conditions whereby a single feeder constitutes a reliable source.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See My Explanation of Negative on Comment 13-121.

Final Action: Hold
13-124 Log #1867 NEC-P13 (695.3(A)(3) (New )

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 13-85
Recommendation: Add text to read as follows:
695.3(A)(1) An alternative source of power to the electric fire pump motor is not required where a back-up engine or back-up steam turbine driven fire pump is installed. [NFPA 20:9.3.3]

Substantiation: The revised wording is a direct quote from NFPA 20 and addresses part of the original proposal.

Panel Meeting Action: Reject
Panel Statement: The submitter does not provide a valid reason for extracting text from NFPA 20. Also, the revised wording is not a direct quote from NFPA 20, and there are other permitted arrangements where an alternate source of power to the electric fire pump motor is not required that the submitter has not extracted.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 11 Negative: 2
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: This comment should have been accepted by the panel. The panel action rejected proposed wording which is a direct quote from NFPA 20 which permits a simpler supply to a fire water pump motor which has a turbine or diesel motor driven pump backup.
RAPPAポート, E.: See my explanation of negative vote on Comment 13-122.

Final Action: Hold
13-127 Log #1092 NEC-P13 (695.4(B))

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 13-89
Recommendation: Accept the Proposal as submitted.

Substantiation: Rather than attempt to rewrite the entire article through a panel proposal or comment, the panel should accept proposals that were submitted to correct deficiencies in the current Article. Proposal 13-89 provides a logical rearrangement of the current text to make the article easier to use and to remove some ambiguity in the text. The substantiation to make these changes is well detailed.

Panel Meeting Action: Reject
Panel Statement: The original proposal was accepted in principle. However, extracted text cannot be modified by this panel.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

Final Action: Hold
13-125 Log #2182 NEC-P13 (695.3(B))
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-89
Recommendation: Continue to Accept in Principle Public Proposal 13-89.
Substantiation: The Proposer, J. Pauley proposes clarification of extant Article 695.4(B) “Supervised Connection.” However, this is extracted text and is part of the Power Supply section which has been completely re-written and submitted as Proposal 13-77. My Public Comment in P13-77 hopes to clarify the new text sufficiently to satisfy the proposer.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-90
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the Technical Correlating Committee action on Proposal 13-77.
Technical Correlating Committee understands that the Panel Action was to add a new second sentence in 695.4(B)(1) and the existing second sentence now becomes the third sentence.
This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Michael Walls, American Chemistry Council
Comment on Proposal No: 13-91
Recommendation: Add text to read as follows:
Exception: In industrial establishments, where the conditions of maintenance and supervision ensure that only qualified persons service the installation, a metal clad disconnecting means may be located within equipment that feeds loads other than the fire pump if the other provisions of 695.4(B)(1) are met.
Substantiation: The original comment was modified to include the requirement for metal clad equipment addressing the need for a secure enclosure. The addition of separate switchgear, cable terminators and bus connections to meet the “not located within equipment that feeds other loads...” requirement added in 2005 actually lowers the installation’s reliability in these industrial installations since additional equipment must be connected to the bus.
Panel Meeting Action: Reject
Panel Statement: The panel’s statement on Proposal 13-91 is still valid; the present wording is clear.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.
Comment on Affirmative: ZGONENA, T.: In addition to the panel statement, the exception would be in violation of Section 695.4(B)(2)(3).

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Lawrence A. Bey, Cummins Power Generation
Comment on Proposal No: 13-89
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the Technical Correlating Committee action on Proposal 13-77.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Elliot Rappaport, Electro Technology Consultants
Comment on Proposal No: 13-96
Recommendation: Change the text to read: “...in accordance with 230.6, 230.9 and Part III and Part IV of Article 230.
Substantiation: There are additional sections to be complied with in addition to Part III and Part IV.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: James S. Nasby, Master Control Systems, Inc.
Comment on Proposal No: 13-97
Recommendation: Revise text to read as follows
RAPPAPORT, E.: The substantiation clearly does not support the proposed
Second, the 2 hour fire rating cited in the substantiation is for the fire pump
NFPA 20, why is NFPA 70 more stringent than NFPA 20 requirements?

Panel Meeting Action: Reject
Panel Statement: This comment does not comply with 4.4.5 of the NFPA
Regulations Governing Committee Projects in that it does not provide text of
the comment, including the wording to be added, revised (and how revised), or
deleted.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-137 Log #1881 NEC-P13 (695.6(B)(2)) Final Action: Reject
Submitter: Mike Holt, Mike Holt Enterprises, Inc.
Comment on Proposal No: 13-99
Recommendation: Continue to accept the proposal, with the following change:
Replace the term “fire-rated” with “fire resistance rated”

Panel Meeting Action: Reject
Panel Statement: The panel contends that “fire-rated” in the context of
building construction is the correct term.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-138 Log #105 NEC-P13 (695.6(B)(2) & (3)) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-100
Recommendation: It was the action of the Technical Correlating Committee
that this Proposal be reconsidered and correlated with the action on Proposal
13-99.
This action will be considered by the Panel as a Public Comment.

Panel Meeting Action: Accept
Panel Statement: This is a direction from the National Electrical Code Technical
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-139 Log #1990 NEC-P13 (695.6(B)(2) & (3)) Final Action: Accept in Principle
Submitter: Robert Konnik, Rockbestos-Surprenant
Comment on Proposal No: 13-100
Recommendation: Continue to accept the change to 2 hour fire resistive rating
from 1 hour.

Panel Meeting Action: Accept in Principle
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.

13-140 Log #1971 NEC-P13 (695.6(B)(2) and (3)) Final Action: Reject
Submitter: Elliot Rappaport, Electro Technology Consultants
Comment on Proposal No: 13-100
Recommendation: Reject the proposal.

Panel Meeting Action: Reject
Panel Statement: The panel agrees with the original submitter’s substantiation.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.

13-141 Log #1131 NEC-P13 (695.6(E)) Final Action: Hold
TCC Action: See the Technical Correlating Committee action on
Comment 13-103.
Comment on Proposal No: 13-105
Recommendation: Please reconsider and accept the proposal.
Substantiation: 348.12(1) permits flexible metal conduit in wet locations
when the conductors are approved for the specific conditions and a “W” type
conductor would be required. The Panel seems to feel that the installation of a
sprinkler head creates a wet location. If that’s the case, then we have a problem
with all the electrical equipment in the fire pump room and throughout the
building.
Panel Meeting Action: Reject
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-142 Log #1132 NEC-P13 (695.6(E)) Final Action: Hold
TCC Action: See the Technical Correlating Committee action on
Comment 13-103.
Comment on Proposal No: 13-106
Recommendation: Please review and reconsider the proposal.
Substantiation: The Panel expresses concern that the EMT from the controller
to the pump should not be permitted as EMT does not have “sufficient
mechanical strength to prevent damage to the conductors”. However, 695.6(B)
Exception, does not restrict the use of EMT to supply the controller so where is
the logic that the inspector needs for enforcement?
Panel Meeting Action: Reject
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.
The physical properties of EMT are more robust than those of MC cable. Chapter 3 allows the use of EMT where exposed to physical damage but does not allow the use of MC cable where so exposed. The 1999 NEC was very clear about the use of MC cable. Section 334-3 Uses Permitted stated: "Unless specifically prohibited elsewhere in the Code and where not subject to physical damage, Type MC cables shall be permitted as follows: O During the 2002 NEC cycle, the cable articles were reformatted, leading to current language that causes confusion about the use of MC cables where exposed to physical damage.

Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 13-142.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

Comment on Affirmative:
ZGONEN A. T.: Although the panel action is correct, rejection of comment 13-142 should not serve as the basis for rejection of this comment, which, in turn, refers to action on a proposal.

13-144 Log #106 NEC-P13 (695.8 (New)) Final Action: Hold

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-107
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the Technical Correlating Committee action on Proposal 13-77.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-145 Log #1141 NEC-P13 (695.8 (New)) Final Action: Hold

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Master Control Systems, Inc.
Comment on Proposal No: 13-107
Recommendation: Continue to Accept in Principle.
Substantiation: This was already correlated with 13.77. It is now clause 695.9(E). Note: This proposal originated with NEMA SC-10, Sub-committee on Fire Pump controllers. This requirement is not the same as the requirement to carry locked rotor current indefinitely. 1) Starting a single design "B" Code "F" or "G" motor can incur first half cycle offset currents of over 12 times motor FLC (FLA). 2) The OCP in the Emergency (Alternate) power supply path must be able to start a fire pump motor in the Across-the-Line (Full Voltage Starting) mode regardless of whether or not the fire pump controller is of the reduced inrush rating type, due to the use of the Manual Mechanical Emergency Operator. 3) The same OCP must be able to start all such pumps plus any other connected loads. This is especially vital where fire pumps are connected either in series (high rise) or in parallel (large facilities such as aircraft hangers).
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-146 Log #107 NEC-P13 (695.13 (New)) Final Action: Hold

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-109
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the Technical Correlating Committee action on Proposal 13-77.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-147 Log #1142 NEC-P13 (695.13 (New)) Final Action: Hold

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Master Control Systems, Inc.
Comment on Proposal No: 13-109
Substantiation: This proposal was/is correlated with Proposal 13-77 as clause 695.10. This is extracted text. This text was added to NFPA-20 due to substantial numbers of compromised installations and confusion in the field over this topic. Junction boxes are frequently used due to the prohibition of using the fire pump controller as a junction box. Numerous controllers have been ruined or compromised regarding both reliability and personnel safety due to the high short circuit ratings — usually 100,000 Arms Sym., but up to 200 Ka -- of typical controllers. Countless others are in the same condition; but, are unknown. This is to give both guidance and clout to inspection personnel.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-148 Log #108 NEC-P13 (695.14 (New)) Final Action: Hold

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 13-110
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the Technical Correlating Committee action on Proposal 13-77.
This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-149 Log #1143 NEC-P13 (695.14 (New)) Final Action: Hold

TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Master Control Systems, Inc.
Comment on Proposal No: 13-110
Substantiation: This proposal was/is correlated with Proposal 13-77 as clause 695.12. This is extracted text. This text was added to NFPA-20 due to substantial numbers of compromised installations and confusion in the field over this topic. Numerous controllers have been ruined or compromised due to flooding because of inadequate raceway (conduit) terminations. Numerous others are vulnerable to the same problem, especially the use of star nuts on 3 and larger top entry or exit conduit. One instance known which nearly required the evacuation of the top two thirds of a high rise hotel due to a flooded middle zone controller. This is a pervasive problem. Fire protection is often interrupted when a sole source controller needs extensive repair or replacement. This is exacerbated by the fact that many, if not most of these controllers are used as service entrance equipment.
Panel Meeting Action: Accept in Principle
Accept the proposal, but change 695.14(D) to read as follows: No alterations other than installation of raceway(s) and multicorductor cable(s) shall be made to the fire pump controller.

13-150 Log #1144 NEC-P13 (695.14 (New))
TCC Action: See the Technical Correlating Committee action on Comment 13-103.
Submitter: Elliot Rappaport, Electro Technology Consultants
Comment on Proposal No: 13-110
Recommendation: Reject the proposal.
Substantiation: The proposal would prohibit the use of conduit and wire to a controller and only permit cable. The substantiation does not address any problem with conduit and wire, but only discusses problems with terminating solid conductors.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Balot Not Returned: 1 Gustafson, R.

ZGONENA, T.: Although the panel action is correct, it is not clear from the panel statement what is the reason for the rejection. The submitter recommends rejection of the entire proposal, but objects to only part of it. While the submitter’s substantiation is true, there is no reason why an AHJ could not accept alterations to the fire pump controller.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on 13-149.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

Comment on Proposal No: 13-103. The panel action should have been to accept in principle. The submitter is not reading and correctly interpreting the added text from proposal 13-111. The special provisions for terminating conductors apply only when using single conductor cable. The revisions were made to 695.15, which covers only Listed Electrical Circuit Protective System to Controller Wiring. The other wiring methods and raceways referred to by the submitter are covered in 695.6. The submitter’s concern was addressed by the panel action on comment 13-103, specifically, in the changes made to 695.11(B), and in 695.18(D).

ARTICLE 700 — EMERGENCY SYSTEMS

Submitter: Steven R. Terry, Electronic Theatre Controls Inc.
Comment on Proposal No: 13-111
Recommendation: Change proposed wording to be added as a last sentence of 700.6(C) as follows, including an FPN:
Automatic Transfer Switches, rated at 600 VAC and below and utilized to transfer feeders or branch circuits between two separate, non-synchronized power sources, shall be listed for emergency system use.
Substantiation: The submitter of this proposal is precisely correct in his substantiation, but the proposal does not go far enough in helping to prevent misapplication of inappropriate devices as transfer switches. The original proposal asked that Automatic Transfer Switches be listed “for emergency system use”. Unfortunately, recent experience has shown that stand-alone Load Control Relays that have a perfectly valid emergency listing under UL 924, (Emergency Lighting and Power Equipment), are being misapplied as branch circuit Automatic Transfer Switches, where UL 1008 devices should in fact be used. These misapplied Load Control Relays are being used to transfer a load between two non-synchronous power sources, but they are not subject to any of the stringent requirements of UL 1008 that are needed for this application, such as fault current testing and mechanical interlock to prevent inadvertent connection of the two power sources. Thus, “listed for use in emergency systems” does not adequately clarify the listing requirements for transfer switches.
The misapplication of non-UL 1008 devices is happening for the following reasons:
A. The NEC is silent in Article 700 on what equipment is required to transfer a branch circuit between two non-synchronous power sources. NFPA 110 is similarly silent on this issue. Automatic Transfer Switches are most commonly used as feeder-level devices. Therefore, installers and engineers are often unaware that devices used to transfer branch circuits are subject to similar switching phenomena, and thus similar risk concerns, as feeder circuit transfer devices. This can lead them to incorrectly assume that devices used to transfer branch circuits need not be UL 1008 listed Transfer Switches.
B. Branch Circuit Automatic Transfer Switches listed under UL 1008 are relatively new devices, as is the concept of transferring single or multiple branch circuits between utility and emergency power sources. Previously, this type of transfer was almost always handled by an upstream feeder-level UL 1008 transfer switch.
C. Stand-alone Load Control Relays (LCRs) listed under UL 924 have recently become available. These are typically double-pole, double-throw devices but single-pole, double-throw and single-pole, single-throw devices also exist. They are intended only for load energization during loss of utility power, that is accomplished by performing a bypass of the wall switch or dimmer controlling the branch circuit. In this case, an upstream UL 1008 transfer switch is doing the actual transfer from normal to emergency power. However, engineers and installers often incorrectly assume that these UL 924 devices can be used to actually transfer the branch circuit load between normal and emergency power.
This situation is not helped by the fact that some manufacturers of these devices have produced data sheets that can be misleading, and do not specifically prohibit this type of transfer. Presumably, this is because no standard, including the NEC, speaks directly to the requirements of this
I believe that industry, UL, and AHJs all need crystal-clear help from the NEC in this situation. The proposed revised wording above would accomplish the following:

1. Require all Automatic Transfer Switches to be listed.
2. Clarify that a listed ATS is required when it is applied either in feeders or in branch circuits, if the application is transferring a load between two non-synchronized power sources.
3. Provide an informative FPN to point the reader to the applicable standard for Automatic Transfer Switches.

Recommendation:

Comment on Proposal No: 13-117

1 Gustafson, R.

Submitter: Technical Correlating Committee on National Electrical Code

Reconsider and Reject Proposal 13-117.

13-155 Log #2343 NEC-P13 (700.6(C))

Final Action: Reject

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 13-117

Recommendation: Reconsider and Reject Proposal 13-117.

Substantiation: There has been no substantiation presented that equipment failure is an issue where appropriately rated and installed electrical equipment is used. The proposed text only requires a transfer switch to be listed, which is only one of many solutions for transferring power to alternate sources. Multiple switchboards from multiple manufacturers are often employed in large facilities to control the power from multiple power sources. It is not reasonable to require such an installation to have equipment that is specifically listed for the transfer or paralleling of sources.

Let's specifically review the submitter’s substantiation:

1) “When the two power sources are not synchronized, as much as twice rated voltage may be seen across the transfer switch contacts.” This particular issue does not exist where the transfer equipment or transfer switch is considered to be a break-before-make configuration. A simple delay between breaking on source and closing on the other addresses this issue. So this substantiation simply inaccurately restricts existing products and technology that is safely used today.

2) “Unless listed, a problem of uncoordinated overcurrent protection may exist should the transfer switch close into a short circuit.” This particular test is found in almost all product standards for equipment, however, we still do not require a switchboard, panelboard or circuit breaker to be listed which is just as critical and where this condition is more likely to occur in the electrical system. Where is the substantiation that a safety issue exists today? Why is the panel moving to potentially exclude product and system solutions that are safely being used today with no reported incidents?

3) “The recognized national standard for testing Automatic Transfer Switch Equipment is ANSI/UL 1008.” The panel should also note that number of other product standards address the issues above including UL 67, UL 98, ad UL 891 to name a few. It should be noted that automatic transfer functionality is often embedded in panelboards and switchboards as a secondary function and may not be specifically listed to UL 1008 and still perform safely.

4) “This proposed requirement as placed under 700.6(C) would specifically apply only to automatic transfer switches. The intent is to not rule out other types of transfer systems that are identified for emergency system use and acceptable to the AHJ under 700.6(A).” If the intent of the committee is to place this restriction only on transfer switches and not require listing on other viable options that are currently safely in use today, then a second sentence should be included to clarify that point. “This listing requirement is specific to transfer switches and is not intended to exclude other approved transfer equipment configurations.”

The panel should reconsider the lack of substantiation and consider the broader applications of products that control the electrical system. The panel must consider the restriction being placed on the user by requiring listing which inherently will exclude safe product solutions and unnecessarily added cost to products without any substantiation that safety will be enhanced by requiring listing. Proposal 13-117 should be rejected.

Panel Meeting Action: Reject

Panel Statement: Without the requirement for listed transfer equipment, the use of unlisted combinations is possible and may present a safety hazard or reduce reliability. For example, the use of two electrically interlocked contactors could easily result in a source-to-source fault if transferring under an out-of-phase condition.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 11 Negative: 2

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: This comment requesting that Proposal 13-117 be rejected should have been accepted as proposed. No substantial justification for the additional listing requirement was provided. The reason noted for requiring listing was an engineering error which can occur whether a switch is listed or not. Listing a transfer switch as required will not prevent misapplication.

RAPPAPORT, E.: The panel statement indicates that the panel intends for the list to encompass more than the section title, Automatic Transfer Switches, implies. Transfer equipment includes automatic transfer switches but also includes circuit breakers and contactors. To what does this proposal apply? UL may have a different definition of “automatic transfer switches” which may be more inclusive than what was proposed. The present text in section 700.6(A) already requires that transfer equipment (inclusive of all types) “be designed and installed to prevent the inadvertent interconnection of normal and emergency sources”. The use of “break before make” operation prevents the misapplication described in the Proposal 13-117 substantiation and the panel statement to this comment. The original proposal should be rejected as it would narrow down safety and reliability but would increase cost and eliminate safe product solutions that have been used successfully in the past and that are acceptable to the AHJ.

13-156 Log #110 NEC-P13 (700.9)

Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 13-118

Recommendation: The Technical Correlating Committee directs that the panel clarify the Panel Action on this Proposal so that the text is in accordance with the NEC Style Manual. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Revise 700.9(B)(5)(a) of the ROP draft to read as follows:

(a) From separate vertical switchboard sections, with or without a common bus, or from individual disconnects mounted in separate enclosures.

Panel Statement: The panel accepts the direction of the TCC. This change complies with the direction of the TCC to comply with the NEC Style Manual.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Gustafson, R.

13-157 Log #2342 NEC-P13 (700.9(B))

Final Action: Reject

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 13-118

Recommendation: The Panel Action on Proposal 13-118 should continue to be Accepted in Principle, but the text should be revised to read as follows:

Revise existing section 700.9(B) by adding a new Number (5) to (B) to read as follows:

5) Wiring from an emergency source shall be permitted to supply any combination of emergency, legally required, or optional loads in accordance with (a), (b) and (c).

(a) Wires from from separate different vertical switchboard sections of a switchboard or the individual enclosures shall be permitted.

(b) The common bus of of separate different vertical switchboard sections of the switchboard or the individual enclosures shall be permitted to be supplied by single or multiple feeders without overcurrent protection at the source.

(c) Legally required and optional standby circuits shall not originate from the same vertical switchboard section, panelboard enclosure or individual disconnect enclosure as emergency circuits.

Substantiation: We agree with Mr. Nasby’s contention, in the explanation of his negative vote, that the revision of 700.9(B) if left as it was accepted at the ROP could create confusion. We suggest the proposal should be revised as shown for the following reasons:

1) The term “sections of a vertical switchboard,” used in (a), is not a commonly used term. The phrase “vertical switchboard sections” parallels that
of other article of the NEC such as NEC 695.3.

2) Use of the term “separate sections,” as in (a) and (b), may drive and unnecessary expectation of physical barriers between the sections as this is also consistent with other separation requirements such as NEC 695.3. Standard switchboards are typically open between the sections, and there is nothing in the proposal that should cause that open construction to be unacceptable.

“Different vertical switchboard sections” conveys the proper message.

3) Item (5)(b) gives permission to omit overcurrent protection in the supply feeders, with the subsequent Exception to (5)(b) allowing overcurrent protection as long as the protective devices are selectively coordinated. Neither of these points are suitable or necessary for this section of Article 700, since 700.9 deals only with the separation of circuits – not the overcurrent protection rules. The presence or absence of overcurrent protection, in this situation, should be governed by the rules in Articles 240 or 445. Any specific deviations from the requirements of Article 240 should be located in Part VI of Article 700, and so noted in Articles 240 and/or 445 by exception where applicable. Selective coordination has nothing to do with the objectives of 700.9, and furthermore selectivity is not a substitute for circuit separation. Based on NFPA 70E and NFPA 99, feeder switches are always assumed to propagate to the line side of overcurrent protection within a panel, selectivity does nothing to protect the system from a separation concern.

Panel Meeting Action: Reject

Panel Statement: The panel believes that different vertical sections must have barriers, and the panel’s previous proposal wording is clearer.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
NASBY, J.: NEMA disagrees with the Panel Action with the following reasons:
The requirement may not accomplish what it is intended to do.

Recommended Resolution:
Revise existing 700.9(B) by adding a new (5) to (B) to read as follows:
(5) Wiring from an emergency source shall be permitted to supply any combination of emergency, legally required, or optional loads in accordance with (a), (b), and (c).

(a) Wiring from separate different vertical sections of a switchboard, connected to a common bus, or from individual disconnects mounted in separate enclosures shall be permitted.

(b) The common bus or separate different vertical sections of the switchboard or the individual enclosures shall be permitted to be supplied by single or multiple feeders without overcurrent protection at the source.

(c) Legally required and optional standby circuits shall not originate from the same vertical switchboard section, panelboard enclosure or individual disconnect enclosure as emergency circuits.

Exception to (5)(b). Overcurrent protection shall be permitted at the source or for the equipment provided the overcurrent protection is selectively coordinated with the downstream overcurrent protection.

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 13-118
Recommendation: I disagree with the panel action. Recommend that Proposal 13-118 be Accepted in Principle and be revised to read as follows:
Revise existing 700.9(B) by adding a new (5) to (B) to read as follows:
(5) Wiring from an emergency source shall be permitted to supply any combination of emergency, legally required, or optional loads in accordance with (a), (b), and (c).

(a) Wiring from separate different vertical sections of a switchboard, connected to a common bus, or from individual disconnects mounted in separate enclosures shall be permitted.

(b) The common bus or separate different vertical sections of the switchboard or the individual enclosures shall be permitted to be supplied by single or multiple feeders without overcurrent protection at the source.

(c) Legally required and optional standby circuits shall not originate from the same vertical switchboard section, panelboard enclosure or individual disconnect enclosure as emergency circuits.

Exception to (5)(b). Overcurrent protection shall be permitted at the source or for the equipment provided the overcurrent protection is selectively coordinated with the downstream overcurrent protection.

Substantiation: As previously stated by Mr. Nasby in the explanation of his negative vote, this proposal may create confusion and thus should be revised as shown. The reasons for these revisions are:

1) The term “vertical switchboard” was used in (a). This is not an industry recognized term. We suggest the panel meant to say, “vertical sections of a switchboard.”

2) The term “separate sections” was used in (a) and (b). This may lead AHJs to believe that there must be physical barriers between the sections, however, standard switchboards are typically open between the sections. Better wording would be “different vertical sections of a switchboard.”

3) Omission of overcurrent protection in the supply feeders appears to be permitted by (b). This omission could result in improperly protected conductors and equipment. NEMA does not support the omission of overcurrent protection in this situation unless it is covered by a rule in Articles 240 or 445. The intent of (B) is to delineate when separation is required between emergency source and other systems and equipment, not to stipulate requirements for overcurrent protection.

4) The proposed exception to (b) is not suitable for this section of Article 700 since 700.9 deals with the separation of circuits. Selective coordination has nothing to do with this objective. Further, selective coordination is a system design feature and not a Code issue intended to do this.

NEMA strongly supports selective coordination as a valuable safety asset in the current range where overloads most often occur. However, NEMA does not support the mandate for Selective Coordination for ALL current ranges and ALL overcurrent devices because safety and reliability can both actually be diminished. This is due to increased hazardous are flash energy with increased equipment damage and potential fire initiation, decreased reliability, and extended downtime before service restoration. Mandates for selective coordination for ALL current ranges and ALL overcurrent devices will not always achieve the safety goal. Selective Coordination requires the expertise and judgment of a Professional Engineer who can balance the design, safety and operating requirements in order to determine the optimum design for each specific facility.

The wording of this section states that ALL overcurrent devices selectively coordinate, but this is not what the definition in Article 100 implies. The definition deals with local overcurrent devices. Selective coordination for ALL overcurrent devices serves no useful localization purpose such as when: 1) Overcurrent devices are located on the primary and secondary sides of a low voltage transformer with no loads in-between. 2) A feeder overcurrent device is connected in series with the main overcurrent device in a downstream circuit. 3) An overcurrent device on a generator is in series with an overcurrent device in a switchboard with no loads in-between. In these instances, requiring both devices to be selectively coordinated does not add to the reliability of the system, which is the stated objective of the CMP.

When overcurrent devices are located on the primary and secondary sides of a low voltage transformer, sized to meet the NEC transformer protection requirements, it is almost impossible to also meet the requirement for selective coordination of this section, regardless of the type of overcurrent protective device chosen.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.
In many instances, it may not be possible to meet the requirements for generator protection provided by an overcurrent device located on or near the generator and provide selective coordination with downstream overcurrent devices. Further, the generator protection functions provided within the engine-generator control, if provided, may not be able to selectively coordinate with downstream overcurrent devices.

The paralleling of generators is often done to enhance system reliability, which is the stated objective of the CMP, however, in order to meet the requirement for selective coordination each generator overcurrent device and controller must selectively coordinate with all downstream overcurrent devices. This may not be possible if the generators are of unequal size.

The upgrade or expansion of an existing building may require the replacement of existing upstream equipment so that it will selectively coordinate with the downstream equipment it must feed. The State of Washington has recognized the significant economic burden this is placing on building owners and businesses and has issued an emergency order exempting existing buildings from meeting the selective coordination requirements of the 2005 NEC.

Systems are normally designed for selective coordination in the overload region of the overcurrent device time-current curves. If this were not so, they would not operate under normal conditions, so what is really being called for in this requirement is overload and short circuit selective coordination. In order to achieve total short circuit selective coordination, the size of upstream overcurrent protective devices may need to be increased and/or time delay trip characteristics increased, thereby possibly increasing the arc flash hazard. In other words, by forcing selective coordination for an event that most likely will never occur, namely a bolted fault, the hazards involved in performing tasks which most likely will occur, namely system maintenance, may be increased. This is another reason why system designers need the flexibility to optimize the design of a system, which the current requirement does not allow.

As stated in the original NEMA substantiation to delete the text in proposal 13-137, we wish to once again point out the following:

4. The need for the flexibility to optimize the design of a system is recognized in IEEE Standard 242-2001 (The Buff Book). In applying protective devices, it is occasionally necessary to compromise between protection and selectivity. While experience may suggest one alternative over another, the preferred approach is to favor protection over selectivity. Which choice is made, however, is dependent on the equipment damage and the affect on the process.

5. The need for the flexibility to optimize the design of a system is also recognized in NFPA 110-2005, Standard for Emergency and Standby Power Systems. Section 6.5.1 states, “The overcurrent protective devices in the EPS shall be coordinated to optimize selective tripping of the circuit overcurrent protective devices when a short circuit occurs. A further explanation of this statement is given in Annex A section A.6.5.1. "It is important that the various overcurrent devices be coordinated, as far as practicable, to isolate faulted circuits and to protect against cascading operation on short circuit faults. In many systems, however, full coordination is not practicable without using equipment that could be prohibitively costly or undesirable for other reasons."

6. This NEC text conflicts with Chapter 27 of the International Building Code and Life Safety Code. If incorporated into the wiring requirements for an essential system in a healthcare facility as required by 517.26, it is common practice in hospital design, which is included in the substantiation for 13-121, is not true - at least, not on a wide spread basis. Additionally, Proposal 13-121, as accepted by CMP-13, would apply to significantly more of the overall health care electrical system - the entire EES, which is the case for Proposal 13-157.26, as modified in Proposal 15-43, properly invokes the requirements of Article 700 for the life safety branch of the emergency system, rather than the entire EES. Proposal 13-121 should be rejected.

This comment was balloted through CMP-15 with the following ballot results:

- 13-160 Log #296 NEC-P13 Final Action: Accept 700(9.D))
- TCC Action: The Technical Correlating Committee directs that this comment be reported as Accept since the requirements for hospitals and health care facilities are within the Scope of Article 517, not Article 700.
- Recommendation: Proposal 13-121, which was Accepted in Principle by CMP-13 should be rejected, returning 700(9.D) to its wording in the 2005 NEC. That would have 700(9.D) ending with the phrase “…business and mercantile.”
- Substantiation: The statement: “[It fire protection of the emergency system wiring] is common practice in hospital design”, which is included in the substantiation for 13-121, is not true - at least, not on a wide spread basis. Additionally, Proposal 13-121, as accepted by CMP-13, would apply to significantly more of the overall health care electrical system - the entire EES, which is the case for Proposal 13-157.26, as modified in Proposal 15-43, properly invokes the requirements of Article 700 for the life safety branch of the emergency system, rather than the entire EES. Proposal 13-121 should be rejected.

This comment was balloted through CMP-15 with the following ballot results:

- 17 Eligible to Vote
- 12 Affirmative
- Mr. E. Morgan voted affirmatively stating: “A similar proposal, 13-51 (Log #3025) was rejected by CMP-15. This Proposal 13-121 should also be rejected.”
- Panel Meeting Action: Reject
- Panel Statement: See panel action and statement on Comment 13-161.
- Number Eligible to Vote: 14
- Ballot Results: Affirmative: 11 Negative: 2
- Ballot Not Returned: 1 Gustafson, R.
- Explanation of Negative: HORNBERGER, B.: This comment from CMP-15 should be accepted. Essential Electrical System requirements for the Health Care industry are the responsibility of Panel 15. Panel 15 should have the authority to reference 700(9.D) in 517 if those systems require fire protection. The comment submitted by Panel 15 indicated that this requirement is not appropriate for hospital and health care Essential Electrical Systems.

RAPPAPORT, E.: The Proposal 13-121 goes beyond the scope of Article 700 by including additional wiring in “hospitals and health care facilities” that are not considered “emergency” circuits. It should be noted that the term “health care facilities” is inclusive of hospitals, nursing homes, limited care facilities, clinics, medical and dental offices, and ambulatory care centers and CMP 15, properly, has jurisdiction over those facilities. Essential electrical systems, included in the proposal, are defined in Section 517.30 to include Life Safety Branch and Critical Branch. Only the Life Safety Branch is intended, by CMP 15, to meet the requirements of Article 700 (see 517.2). There is no substantiation for the Critical Branch to meet Article 700. There is also no need for selective coordination to Section 700(9.D) since it is already clearly covered in Article 517. CMP 15 properly invoked the requirements of Article 700 for the Life Safety branch in Proposal 15-43. The requirements for emergency systems in all health care facilities should remain with Panel 15.

TCC Action: Based on the Technical Correlating Committee action on Comment 13-160, the Technical Correlating Committee directs that this comment be reported as Reject.
- Submitter: Barry E. O’Connell, Tyco Thermal Controls
- Comment on Proposal No: 13-121
- Recommendation: I agree with this Proposal as amended by the Panel Action.
- Substantiation: In response to the negatives, a parallel proposal to Panel 15 on Article 517 was Rejected as being more appropriate for this panel, as follows: CMP 15 Statement: “Fire protection is primarily a function of the Building Code and Life Safety Code. If incorporated into the wiring requirements for an emergency system, it should be done through expanding the occupancy classes listed in 700.9(D).

Panel Meeting Action: Accept
- Number Eligible to Vote: 14
- Ballot Results: Affirmative: 11 Negative: 2
- Ballot Not Returned: 1 Gustafson, R.
- Explanation of Negative: HORNBERGER, B.: This comment should be rejected. Essential Electrical System requirements for the Health Care industry are the responsibility of Panel 15. The comment submitted by Panel 15 indicated that this requirement is not appropriate for hospital and health care Essential Electrical Systems.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-160.
13-162 Log #2179 NEC-P13  
(700.9(D))  
Final Action: Hold  
Submitter: Edward Walton, Draka Cableteq  
Comment on Proposal No: 13-123  
Recommendation: Add new text to 700.9(D) as follows:  
(3) Branch Circuit: Branch circuits that originate in a location remote from the area being served shall meet one of the following conditions:  
(1) Be installed in spaces or areas that are fully protected by an approved automatic fire suppression system  
(2) Be a listed electrical circuit protective system with a minimum 1-hr fire rating  
(3) Be protected by a listed thermal barrier system for electrical system components  
(4) Be protected by fire-rated assembly listed to achieve a minimum fire rating of 1 hr  
(5) Be embedded in not less than 50 mm (2 in.) of concrete  
(6) Be a cable listed to maintain circuit integrity for not less than 1 hr when installed in accordance with the listing requirements.  
Revised reference to 700.9(D) to read:  
700.9(D)(1), (D)(2), and (D)(3)  
Optional. Add FPN as follows:  
FPN: A remote location is defined as an area separate from the Emergency System Circuit load such as a different floor in a multistory building or a different fire zone in a place of assembly or stadium.  
Substantiation: This proposal has been modified to resolve the panel’s concern that this “level of protection” is not warranted for all branch circuits. The branch circuit for which this protection is required is now defined as a remotely located branch circuit.  
5-a. Even though a fire caused circuit failure would be more catastrophic for the feeder cable, the remotely located branch circuit is far more vulnerable if it is run through the protected premises before connected to the load.  
5-b. Presently the emergency branch circuit panel could be located in the basement of a multistory building (7 stories or higher) or on the opposite side of an assembly hall or stadium far from the emergency circuit load and without the required fire protection of 700.9(D).  
5-c. One code user misinterpretation is that the feeder-circuit wiring terminates at the transfer switch and anything beyond that does not require fire protection. Adopting this proposal would help clarify this misinterpretation. I have included an optional FPN if the panel feels it needs to define remote location.  
This proposal could be located in Section IV if the panel believes this is a more proper location.  
Panel Meeting Action: Hold  
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals. This action is to hold the comment only.  
Number Eligible to Vote: 14  
Ballot Results: Affirmative: 13  
Ballot Not Returned: 1 Gustafson, R.  

13-163 Log #1989 NEC-P13  
(700.9(D)(1)(2) FPN)  
Final Action: Accept in Principle  
TCC Action: The Technical Correlating Committee directs that this comment be reported as Accept in Principle based on the panel action on Comment.  
13-164.  
Submitter: Robert Konnik, Rockbestos-Surprent  
Comment on Proposal No: 13-125  
Recommendation: Add a fine print note to 700.9(D)(1)(2) as follows:  
FPN: UL guide information for electrical protection systems (FHT) contains information on proper installation requirements to maintain the fire rating.  
Substantiation: Reworded this to be the same as accepted in the panel action on Proposal 13-101.  
Panel Meeting Action: Accept  
Number Eligible to Vote: 14  
Ballot Results: Affirmative: 13  
Ballot Not Returned: 1 Gustafson, R.  

13-164 Log #1978 NEC-P13  
(700.9(D)(1)(2), FPN)  
Final Action: Accept  
Submitter: Elliot Rappaport, Electro Technology Consultants  
Comment on Proposal No: 13-125  
Recommendation: Accept the panel action on Proposal 13-101 as a FPN to this section.  
Substantiation: The panel action on this proposal does nothing to add the FPN to this article.  
Panel Meeting Action: Accept  
Number Eligible to Vote: 14  
Ballot Results: Affirmative: 13  
Ballot Not Returned: 1 Gustafson, R.  

13-165 Log #111 NEC-P13  
(700.9(D)(1)(4))  
Final Action: Accept  
TCC Action: The Technical Correlating Committee directs that the panel action be revised to read as follows to comply with the NEC Style Manual:  
"(4) Be protected by a listed fire-rated assembly that has a minimum fire rating of 1 hour and contains only emergency wiring circuits."  
Submitter: Technical Correlating Committee on National Electrical Code  
Comment on Proposal No: 13-124  
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the NEC Style Manual. This action will be considered by the Panel as a Public Comment.  
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.  
Panel Meeting Action: Accept  
Revise the text of 700.9(D)(1)(4) to read as follows:  
(4) Be protected by a listed fire-rated assembly that contains only emergency wiring circuits. This assembly shall have a minimum fire rating of 1 hour.  
Panel Statement: The panel accepts the direction of the TCC to clarify the statement and comply with the NEC Style Manual.  
Number Eligible to Vote: 14  
Ballot Results: Affirmative: 12 Negative: 1  
Ballot Not Returned: 1 Gustafson, R.  
Explanation of Negative:  
RAPPAPORT, E: See my explanation of negative vote on Comment 13-166.  

13-166 Log #1976 NEC-P13  
(700.9(D)(1)(4))  
Final Action: Reject  
Submitter: Elliot Rappaport, Electro Technology Consultants  
Comment on Proposal No: 13-124  
Recommendation: Reject the proposal.  
Substantiation: The proposal mixes the need to maintain electrical separation with the need for physical separation. There is no substantiation that a one hour rated enclosure containing both normal and emergency systems is more susceptible to fire.  
Panel Meeting Action: Reject  
Panel Statement: The panel believes that there is a need to physically separate normal and emergency circuits.  
Number Eligible to Vote: 14  
Ballot Results: Affirmative: 12 Negative: 1  
Ballot Not Returned: 1 Gustafson, R.  
Explanation of Negative:  
RAPPAPORT, E: Section 700.9(D)(1) provides for fire protection for feeder circuit wiring by any one of 6 methods. The presence of normal circuit feeders in the same fire rated assembly does not increase the susceptibility of the emergency conductors to damage from fire and no substantiation to that effect has been provided. Section 700.9(B), cited in the proposal substantiation, refers to keeping entirely independent with respect to same “raceway, cable box, or cabinet.” There is no reference to maintaining any physical separation of raceways. If a normal circuit raceway or cable located adjacent to an emergency feeder raceway or cable presents increased susceptibility to fire damage, as yet unsubstantiated by test or field experience, then it should apply to all of 700.9(D)(1) not only 700.9(D)(1)(4).  

13-167 Log #1302 NEC-P13  
(700.12(A))  
Final Action: Reject  
Submitter: David Sroka, Turner Falls, MA  
Comment on Proposal No: 1-54  
Recommendation: Add a sentence as follows:  
“The short-circuit current rating shall be included on the nameplate for battery inverter.”  
Substantiation: This data is hard to obtain after the original installation. It is important information. The nameplate is the best place for the equipment’s rating. Circuit breaker, fuse or transfer switch rating can mistakenly be taken as the unit’s rating. Lastly, it is safest to read the nameplate to get this information rather than physical removal of covers.  
Panel Meeting Action: Reject  
Panel Statement: This language is more appropriate for a product standard.  
Number Eligible to Vote: 14  
Ballot Results: Affirmative: 13  
Ballot Not Returned: 1 Gustafson, R.  

13-168 Log #2116 NEC-P13  
Final Action: Accept in Principle  
(700.12(B)(6))  
Submitter: Mark R. Hilbert, Wolfeboro, NH  
Comment on Proposal No: 13-131  
Recommendation: Accept the Proposal.  
Substantiation: The new FPN was not intended to identify that the disconnecting means which is the subject of 700.12(B)(6) must disconnect the “service.” The FPN is necessary to identify to users of the NEC that this disconnecting means must be rated as “suitable for use as service equipment.” As described in Article 100, conductors supplying a building or other structure...
Outdoor Generator Sets. Where an outdoor housed generator set is:

Accept the proposal in principle and revise 700.12(B)(6) to read:

Ballot Not Returned:

Panel believes that the addition of the FPN is unnecessary.

Panel Statement:

would be prudent to locate a FPN here to reference 250.32(D).

that the requirements of that section apply to the condition of 700.12(B)(6). It

a proposal to 250.32(D) to include a reference to 700.12(B)(6) to identify

and, therefore, this would be an appropriate location for a FPN providing

from the building or other structure it is supplying are often misunderstood

Substantiation:

Recommendation:

Comment on Proposal No:

Submitter: Mark R. Hilbert, Wolfeboro, NH

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Gustafson, R.

13-169 Log #2117 NEC-P13 Final Action: Accept in Principle
(700.12(B)(6))

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 13-169.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-171 Log #2263 NEC-P13 Final Action: Reject
(700.12(D))

Submitter: Aden Lunden, Diversified Electric Services

Comment on Proposal No: 13-131a
Recommendation: I agree with code panel. The word Accepted cannot be changed to Approved by the Panel. The reason that the comment in the recommendation cannot be changed is Accepted and Approved are two different definitions. One cannot be substituted for the other.

Substantiation: I recommend that Acceptable should be a new definition in the Code book. Acceptable defined will resolve any confusion to what is Approved compared to what is Allowable or Acceptable.

Panel Meeting Action: Reject
Panel Statement: This comment does not comply with 4.4.5 of the NFPA Regulations Governing Committee Projects in that it does not provide text of the comment, including the wording to be added, revised (and how revised), or deleted.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-172 Log #112 NEC-P13 Final Action: Accept
(700.16)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 13-133
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text in accordance with the NEC Style Manual. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to clarify the statement in accordance with the NEC Style Manual. See panel action and statement on Comment 13-173.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-173 Log #347 NEC-P13 Final Action: Hold
(700.16)

"TCC Action: The Technical Correlating Committee directs that comment 13-173 be reported as “Hold” consistent with Section 4.6.2.2 of the NFPA Regulations Governing Committee Projects since the addition of the words “component” and “ballast” constitutes new material that has not had public review.

Submitter: Samuel Goble, Department of General Services / Rep. Commonwealth of Virginia

Comment on Proposal No: 13-133
Recommendation: Revise text to read:

"...failure of any individual lighting element component such as the burning out of a light bulb lamp or ballast, cannot... ."

Substantiation: The term “element” is often confused for a “filament”. Using an example can often confuse the intent of the code section, such as in this example. Replacing the word “element” with “component” does not change the intent or meaning of this code section and replaces a layman’s term such as the “element” often misused as the filament of a lamp. Using the term “component” covers all parts of all types of luminaries.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-174 Log #1880 NEC-P13 Final Action: Accept
(700.16)

"TCC Action: The Technical Correlating Committee directs that Comment 13-174 be reported as Accept to correlate with the panel action on Proposal 13-133 to change “light bulb” to “lamp”.

Submitter: Mike Holt, Mike Holt Enterprises, Inc.

Comment on Proposal No: 13-133
Recommendation: Continue to accept, with the following change:

"...failure of any individual lighting element such as the burning out of a light bulb lamp, cannot... ."

Substantiation: The proponent is correct that “lamp” should be used instead of “light bulb”, but the phrase “burning out of” should remain, as it helps detail the intent of this section.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 13-173.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.
Specifying power air breakers for commercial office buildings with their
Proposal 13-135 should be accepted in principle
CMP-13 says that selective coordination increases the reliability of the
met with either a fuse or an MCCB.
A/C rating of the fuse panel, then you have a Code requirement that cannot be
manufacturer does not work for larger downtown network systems where fault
are fuses or fuses! However, even the new fuse panel offered by one fuse
let the design community in on their secret, because right now the alternatives
many thousands of installations around the country can be made safer? If
should make such a mistake, would fix it immediately, long before the space
fault. A bolted fault in a branch circuit might happen when the building is
requirement should be adequate without the NEC adding more restrictions onto
side overcurrent protective devices provides no exception for installations
where the ability to rapidly restore power may be more critical than selective
coordination. This may be only achievable in certain installations with fuses
which may not be available to restore power after a fuse operation. An
exception should be provided to permit flexibility in the design where speed of
restoration of power is judged to be more important than a brief outage.
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAVORT, E.: The suggested FPN provides adequate guidance to the
qualified design personnel of the importance of selective coordination along with
permitting other considerations essential for safety to human life.
ZGONENA, T.: See My Explanation of Negative on 13-175.

I. 700.25 Add a fine print note as follows:
700.23 Dimmer Systems. A dimmer system containing more than one
dimmer and listed for use in emergency systems shall be permitted to be used
and coordinated with MCCB’s, to protect or energizing emergency lighting circuits. Upon
failure of normal power, the dimmer system shall be permitted to selectively
energize only those branch circuits required to provide minimum emergency
illumination. All the branch circuits supplied by the dimmer system cabinet
shall comply with the wiring methods of Article 700.
Panel Statement: The panel accepts the direction of the TCC to clarify the
panel action on this proposal in accordance with the NEC Style Manual.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

Panel Meeting Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Proposal on Comment No: 13-135
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the
NEC Style Manual. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with Section 3.4.2 and 3.4.3 of the Regulations
Governed by Committee Projects.

Panel Meeting Action: Reject
Submitter: Hugh O. Nash, Jr., Nash Lipsev Burch
Comment on Proposal No: 13-136
Recommendation: Continue to reject 13-136 which applies to 700.26 Ground
Fault Protection of Equipment.
Substantiation: Regardless of the size of the alternate source, ground-fault
interruption of the alternate source overcurrent device can cause interruption of the
alternate source feed to critical equipment. This is of particular concern to
healthcare facilities. The panel statement (reason for reject) states: “Automatic
disconnecting may not be provided but is not required”. In healthcare facilities, automatic disconnecting may not be provided under any circumstances.
517.1(B) states, “The additional levels of ground-fault protection shall not be
installed as follows: (1) On the load side of the essential electrical system transfer switch, (2) Between the onsite generating unit (as described in 513.35(B) and the essential electrical system switch(es)”. For many years, 517.17 warned the user against placing GFP interruption between the
alternate source and the transfer switch(es). This warning has now become a
prohibition. There are documented instances where GFP interrupted the normal
source and the alternate source, leaving critical care areas without normal or
alternate power.
Panel Meeting Action: Accept
Submitter: Hugh O. Nash, Jr., Nash Lipsev Burch
Comment on Proposal No: 13-137
Recommendation: This comment is merely to add support to the panel action which
was to reject the proposal.
Substantiation: Overcurrent conditions (Locked Rotor and/or Short Circuit)
in the Fire Pump Room are to be cleared, and be resettable, in the pump room
(which, per clause 5.12 of NFPA 20 is required to be “separated or protected by fire-rated construction) and not at some electrically upstream OCPD which
may be inaccessible during a fire and possibly disable other emergency loads/
systems.
Panel Meeting Action: Accept
Submitter: Hugh O. Nash, Jr., Nash Lipsev Burch
Comment on Proposal No: 13-138
Recommendation: Continue to reject 13-138, which applies to 700.26 Ground
Fault Protection of Equipment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with Section 3.4.2 and 3.4.3 of the Regulations
Governed by Committee Projects.

Panel Meeting Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Proposal on Comment No: 13-134
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the
NEC Style Manual. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with Section 3.4.2 and 3.4.3 of the Regulations
Governed by Committee Projects.

Panel Meeting Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Proposal on Comment No: 13-135
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the
NEC Style Manual. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with Section 3.4.2 and 3.4.3 of the Regulations
Governed by Committee Projects.

Panel Meeting Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Proposal on Comment No: 13-136
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the
NEC Style Manual. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with Section 3.4.2 and 3.4.3 of the Regulations
Governed by Committee Projects.

Panel Meeting Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Proposal on Comment No: 13-137
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal so that the text is in accordance with the
NEC Style Manual. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with Section 3.4.2 and 3.4.3 of the Regulations
Governed by Committee Projects.
TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Russell M. Anderson, Metron Inc.

Comment on Proposal No: 13-137

Recommendation: This Comment is to provide additional support to the panel action which was to REJECT the proposal.

Substantiation: Should an overcurrent condition occur in the fire pump motor, the circuit breaker in the fire pump controller should be the device to trip, rather than any upstream device installed in the feeder to the fire pump. This device may not be readily available or its location known and, therefore, unavailable for immediate resetting to get the fire pump motor back online.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

13-181 Log #564 NEC-P13 Final Action: Reject (700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Daniel Gendebien, Torna Tech Inc.

Comment on Proposal No: 13-137

Recommendation: Torna Tech supports the panel action which was to REJECT the proposal.

Substantiation: It is important that faults are to be cleared in the pump room. If not, those OCPD may be inaccessible during a fire and possibly disable other emergency load equipment.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

13-182 Log #806 NEC-P13 Final Action: Reject (700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Kevin J. Lippert, Eaton Corporation

Comment on Proposal No: 13-137

Recommendation: I disagree with the panel action. Accept Proposal 13-137 as written.

Substantiation: The panel statements during the 2005 revision cycle, and as stated in the 2008 ROP, indicate that CMP-13’s intent for these circuits is to mandate selective Coordination of ALL overcurrent devices, across ALL current ranges. This initially appears to support CMP-13’s stated goal of increasing safety and reliability of the electrical system. However, an in-depth analysis reveals that it is not ALWAYS the case! There are circumstances where overcurrent devices (both fuses and circuit breakers) selected specifically to comply with the 2005 NEC mandate, will have the unwanted consequence of substantially increasing the hazardous arc flash energy with corresponding increased equipment damage and potential fire initiation with associated decreased reliability, and extended downtime before service restoration. This mandate also eliminates the Professional Engineer’s expertise and judgment from determining the optimum design for each specific facility by balancing design, safety and operating requirements. Furthermore, selective coordination is a system design issue, not a Code issue.

Eaton strongly supports selective coordination as a valuable safety asset in the current range where overload must often occur. However, Eaton does not support the mandate for Selective Coordination for ALL current ranges because safety and reliability will inevitably be diminished.

Alternatively, CMP-13 could choose to make this a FPN, similar to the 2002 NEC FPN to 700.25, and advising that selective coordination MAY increase overall reliability of the system.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

Comment on Affirmative:

WHITTALL, H.: See NEMA Explanation of Negative on 13-177.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

13-184 Log #1189 NEC-P13 Final Action: Reject (700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: John Cool, PowerPlus Engineering Inc

Comment on Proposal No: 13-137

Recommendation: The Technical Panel should continue to reject this proposal.

Substantiation: The present selective requirement for emergency systems is important for life safety reasons. It is one more requirement that helps ensure power for important loads during times of emergency. During this time, the building may be on fire or physically damaged which can in itself create faults in the system. Article 700 has other similar requirements with the intent of keeping emergency loads powered as long as possible. For instance, for fire pumps there is no overload protection for the pump motor; the concept is to keep the water flowing as long as possible, even to the point of ruining the motor. Selective coordination is another requirement that provides loads power for the maximum time. Without selective coordination, a branch or feeder fault may unnecessarily take out the entire system or a major portion of the system. This could unnecessarily imperil lives. The present requirement is not in conflict with NFPA 110. However, the scope of NFPA 70 is more comprehensive than NFPA 110. NFPA 110 covers from the emergency power source to the transfer switch and NFPA 70 covers the entire system. We have designed many facilities and can engineer the system for selective coordination. There definitely are issues that must be analyzed, but with proper analysis and specification flexibility this selective coordination requirement is achievable. We have found that systems can be designed using fusible or circuit breaker equipment.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.
ZGONENA, T.: The committee is to be commended for acknowledging

STAFFORD, T.: The Panel action was correct and this member agrees with

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log (1) Between transformer primary and secondary overcurrent protective

Add an exception to read as follows:

13-175.

some conditions under which total selective coordination is not the optimum

provide some relief for series coordination issues, and are certainely more

additional reliabilty or safety for the system. The exceptions that were added

that there are conditions where selective coordination does not add any

selective coordination between series overcurrent protective devices, where only one overcurrent protective device or set of overcurrent

devices, where only one overcurrent protective device or set of overcurrent

device operation in the instantaneous range. It's not that

selectively coordinated with all supply side overcurrent protective devices

faults with a duration of 0.1 seconds and longer.

selectively coordinated with all supply side overcurrent protective devices

700.27 Coordination.

Recommendation:

Comment be reported as “Reject” because less than two-thirds of the

members eligible to vote have voted in the affirmative as required in

4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Gustafson, R.

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instrument, but 700.27 dictates it be used as such. The contradictions of the intent of 700.27 with other industry standards PLUS the lack of any standard for determining when a system is totally selectively coordinated should, as a minimum, result in delaying the implementation of 700.27 until such time that the industry’s concerns are addressed.

Panel Meeting Action: Rejext

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log 

#1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

13-185 Log #1278 NEC-P13 Final Action: Accept in Principle 

(700.27)

Submitter: Camilo Martinez-Angulo, AmpSafe, LLC

Comment on Proposal No: 13-135

Recommendation: Proposal 13-135 should continue to be rejected by the Panel. The Panel should continue to require selective coordination for emergency systems.

Substantiation: I am a consulting engineer with considerable experience dealing with instantaneous protection and selective coordination. It has been my experience that selective coordination is always almost achievable with relays, circuit breakers, current limiting fuses, or combinations of these devices. Depending upon the type of system and the available short circuit current, I may specify adjustable instantaneous trips, electronic trips and/or short time delay. Whenever the short time delay causes the arc-flash energy to get out-of-hand, I specify zone selective interlocking to minimize the hazard. I will typically specify two levels of ground fault protection whenever the feeder devices are larger than about 200 amperes, so selectively coordinating with ground fault protection has not really been a problem. I find that the main purpose of Articles 700 and 701 is to maximize continuity of service so I find it so very odd that users are trying to figure out ways to eliminate the requirements from the NEC. To me, this requirement for selective coordination is an absolute necessity when it comes to emergency systems and legally mandated systems. It takes work and engineering knowledge/experience to selectively coordinate an electrical distribution system without compromising safety and protection, and that’s what we've been able to do.

Panel Meeting Action: Accept in Principle

Add an exception to read as follows:

Exception: Selective coordination shall not be required in (1) or (2):

(1) between transformer primary and secondary overcurrent protective devices, where only one overcurrent protective device or set of overcurrent protective devices exist(s) on the transformer secondary, (2) between overcurrent protective devices of the same size (ampere rating) in series.

Panel Statement: The exception was added to provide relief for series coordination issues.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 11 Negative: 2

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-187 Log #1317 NEC-P13 Final Action: Reject 

(700.27) (New)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: James Harvey, University of Michigan Hospitals and Health Centers

Comment on Proposal No: 13-135

Recommendation: I disagree with the Panel Action. Accept related Proposal 13-135, (and 13-137) as written. These two proposals are to delete section 700.27 (now in 70-2005), from the 70-2008 edition.

Substantiation: Currently we are operating under NEC 70-2002, and will soon adopt 70-2005 - but with a deletion of the requirement for adhering to section 700.27.

The emergency power systems encountered at our larger facilities (and some of the smaller facilities) are very complex. The current code section removes the option for using engineering judgment, as the deciding factor on how our emergency power systems are to be coordinated. This loss of professional judgment would be detrimental (in certain cases) to the safety of our patients, our staff, and the property themselves. In all of our new facilities, and in existing facilities undergoing major renovation, the design is done by a registered professional engineer, and is also reviewed by a staff registered engineer.

On occasion, we need to select devices that are not completely coordinated over the entire fault range in order to lower arc-flash energies to protect staff. Also, on occasion we need to put two devices in series (but not coordinated with each other), one at source, one at load (when these are separated by large distances). In these cases, the lack of coordination between the devices causes no problem since the same downstream loads are loss regardless of which operates.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See My Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

13-187 Log #1317 NEC-P13 Final Action: Reject

(700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Gustafson, R.

Comment on Proposal No: 13-146

Recommendation: Revise text as follows:

700.27 Coordination. Emergency system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices for faults with a duration of 0.1 seconds and longer.

Substantiation: This proposal recognizes the panel’s desire to improve the reliability of emergency power systems through selective coordination. The addition of the 0.1 second criterion permits engineers and AHJs to use readily available and published time current curves to determine if a system is selectively coordinated to a substantial degree. It negates the need to rely on unregulated manufacturer testing to determine if devices selectively coordinate in the instantaneous range. Most faults have enough resistance to limit the amount of current that results in overcurrent device operation in the instantaneous range. It’s not that instantaneous faults are less important, but the requirement to design a system to selectively coordinate under those circumstances requires burdensome evaluations and cost, with a very small chance of return on the investment.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 6 Negative: 7

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

HATTAWAY, B.: I am concerned with the selected fault current coordination where the generator and the service equipment are of different manufacturers. I am in favor of the 1/10 second delay in the coordination as stated in Comment 13-187; therefore, I am voting negative to support the 1/10 second delay.

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.
We are a consulting engineering firm that specializes in short-circuit and able to design with transfer switches and different relaying schemes in order that can both selectively coordinate and minimize arc-flash hazards. We are and provide for instantaneous reaction time for short circuits (including For example, we can specify zone selective interlocking with short-time delay overload and short-circuit conditions by utilizing various design techniques. while at the same time, minimizing arc-flash hazards and improving reliability the selective coordination requirements found in 700.27, 701.18, and 620.62, circuits. proposals that remove the requirement for selective coordination of emergency Recommendation: Code Panel 13 should accept the proposal to delete 700.27. Substantiation: New York City has had a requirement for Selective Coordination for decades. The NEC has also required selective coordination for ground faults in health care facilities for decades. Requirements for selectively coordinated overcurrent protective devices in elevator circuits have existed in the NEC since the 1993 edition. Beginning with the 2005 NEC, requirements were added for selective coordination of emergency circuits and legally required standby systems. We’ve found design solutions to meet these requirements, with both circuit breakers and fused switches, without compromising safety or reliability, and wonder what all the fuss is about. We are a consulting engineering firm that specializes in short-circuit and coordination studies, so we are intimately familiar with what it takes to selectively coordinate both fuses and circuit breakers. It does take sharp engineering skills to design both a selectively coordinated system and at the same time to minimize arc-flash energies and equipment short-circuit damage, but that is precisely what’s needed for critical circuits such as are found in elevator, emergency systems, and legally required standby systems. But, it can be achieved on a regular basis. Requiring total selectivity does not tie our hands when it comes to multiple emergency generators. We can design in transfer switches. We’ve heard of complaints about two devices in series of the same size not coordinating. Simply making the downstream device a non-fused switch solves that problem. There is enough latitude in 450.3 to choose the overcurrent protective devices on the line side and load side of a transformer so that they will selectively coordinate. We also do not see any issues with violations of other NFPA Standards that call out for “optimized” coordination. To us, optimized means the very best that you can do, and total selectivity is certainly the very best that you can do. Finally, there are arguments that there needn’t be a requirement to selectively coordinate in the short-circuit range because short-circuits rarely happen. If that were the case, we couldn’t have Sections 110.9 and 110.10 in the NEC. Nor do we need the new requirements for marked short-circuit current ratings on industrial machinery or industrial control panels. Do you insure your home for just $5,000 because most claims are under that amount? Or, do you insure it for the full value? Of course you insure it for the full value, even though a total loss may be an unusual event. Needless to say, we believe the Panel should continue to support the requirement for selective coordination in elevator circuits. Panel Meeting Action: Accept Panel Statement: Number Eligible to Vote: 14 Ballot Results: Affirmative: 7 Negative: 6 Ballot Not Returned: 1 Gustafson, R. Explanation of Negative: ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340). NASBY, J.: See NEMA Explanation of Negative on 13-204. RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177. WHITTALL, H.: See my explanation of negative vote on Comment 13-178. WOOD, T.: See My Explanation of Negative on Comment 13-204. ZGONENA, T.: See My Explanation of Negative on 13-175. 1-139 Log #1399 NEC-P13 (700.27) Final Action: Reject

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects. Submitter: Merrell Young, Herzog Engineering Comment on Proposal No: 13-135 Recommendation: Panel 13 needs to continue to Reject this and similar proposed that remove the requirement for selective coordination of emergency circuits. Substantiation: I would consider our consulting firm as experts on arc-flash, short-circuit, and coordination studies. As such, we have been able to test the selective coordination requirements found in 700.27, 701.18, and 620.62, while at the same time, minimizing arc-flash hazards and improving reliability and continuity of service. We are able to obtain selective coordination for both overload and short-circuit conditions by utilizing various design techniques. For example, we have found that if circuit breakers are in series for a short-time delay on the upstream circuit breaker so that upstream and downstream circuit breakers will coordinate in both the overload zone and the short-circuit zone, and prove for various fault currents (including fault levels). The circuit breaker requires that the fault current at the downstream circuit breaker be to less than the instantaneous region of the upstream circuit breaker. In real world applications, these breakers are in close proximity and the same bus see very nearly the same fault current. The upstream circuit breaker has instantaneous trips at 8 to 12 times the rating of the circuit breaker. If a typical 5 percent system impedance is assumed, the available fault current is 5 times the rating of the upstream circuit breaker and the tables do not cover the coordination of the downstream circuit breaker. Selectively coordinating circuit breakers on a 480 volt system often requires low voltage power circuit breaker (LVPCB) construction, with the circuit breaker’s instantaneous trips disabled. On high fault current systems, disabling the instantaneous trips on case-hardened LVPCBs results in delays greater than cycles which is beyond the certifications specified for busway and automatic transfer switches. Each LVPCB costs more than $25000. the substantiation for
The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.

**Final Action:** Reject

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The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Comment on Proposal No:** 13-137

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on 13-175.
TCC Action: The Technical Correlating Committee directs that this 
Comment be reported as “Reject” because less than two-thirds of 
the members eligible to have voted in the affirmative as required in 
4.4.6.4 of the NFPA Regulations Governing Committee Projects. 
Submitter: James S. Nasby, Master Control Systems, Inc. 
Comment on Proposal No: 13-145 
Recommendation: Continue to REJECT this proposal. 
Substantiation: The submitter proposes a FPN to indicate that the selective 
coordination to “optimized” can not be achieved. However, it is common for normal 
shorting devices to disrupt power to an entire building. If there are specific areas of particular difficulty in selective coordination of 
electricity, these should be brought to the attention of the Panel 
and the editor of this document. The text would effectively negate the requirement for selective coordination of 
electricity.

Panel Meeting Action: Accept 
Number Eligible to Vote: 14 
Ballot Results: Affirmative: 7 Negative: 6 
Ballot Not Returned: 1 Gustafson, R. 
Explanation of Negative: 
ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log 
#1340).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
WOOD, T.: See My Explanation of Negative on Comment 13-204.
ZGONENA, T.: See My Explanation of Negative on 13-175.

TCC Action: The Technical Correlating Committee directs that this 
Comment be reported as “Reject” because less than two-thirds of 
the members eligible to have voted in the affirmative as required in 
4.4.6.4 of the NFPA Regulations Governing Committee Projects. 
Submitter: James S. Nasby, Master Control Systems, Inc. 
Comment on Proposal No: 13-146 
Recommendation: Continue to REJECT this proposal. 
Substantiation: The submitter proposes a FPN to indicate that the selective 
coordination to “optimized” can not be achieved. However, it is common for normal 
shorting devices to disrupt power to an entire building. If there are specific areas of particular difficulty in selective coordination of 
electricity, these should be brought to the attention of the Panel 
and the editor of this document. The text would effectively negate the requirement for selective coordination of 
electricity.

Panel Meeting Action: Accept 
Number Eligible to Vote: 14 
Ballot Results: Affirmative: 7 Negative: 6 
Ballot Not Returned: 1 Gustafson, R. 
Explanation of Negative: 
ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log 
#1340).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
WOOD, T.: See My Explanation of Negative on Comment 13-204.
ZGONENA, T.: See My Explanation of Negative on 13-175.
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
WOOD, T.: See My Explanation of Negative on Comment 13-204.
ZGONENA, T.: See My Explanation of Negative on 13-175.

13-201 Log #1609 NEC-P13  Final Action: Reject

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.6 of the NFPA Regulations Governing Committee Projects.
Submitter: Marcelo Valdes, GE
Comment on Proposal No: 13-137
Recommendation: Delete 700.27, Reinstall FPN from the 2002 NEC.
Substantiation: Comment in support of proposals 13-137, Log #1950 NEC-P13. This comment is in support of the proposal comment to delete 700.27 as written in NEC 2007.
Reasons to support the proposal to delete 700.27
1) Conflict with NFPA 110 recommendations and, consequently, conflict with IBC requirements, chapter 27.
2) Conflict with generally adopted electrical design guidelines such as IEEE Recommended practices commonly known as the “Color Books”. IEEE standard 242 “Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems”. These conflicts put the selectivity requirement in the NEC in conflict with OSHA regulations.
3) Maximum overcurrent protection for any system is not a matter of simply providing selective tripping. Maximum reliability must take into account minimizing the effect of any abnormal conditions based on the probability of the conditions considered, the immediate effect of the event and the time to remedy the condition and restore needed power to the loads affected by the abnormal event. An industry reference for evaluating the reliability, normally expressed as availability, of power distribution systems is IEEE standard 493-1997, “Recommended Practice for Design of Reliable Industrial and Commercial Power Distribution Systems”. The highest level, system reliability is in part related to interruption frequency and expected duration of load interruption events. If selectivity is achieved by increasing the size of protective elements or slowing the protection these elements could otherwise provide equipment and conductor damage may be increased, and hence the repair time, or downtime will be increased. This can lower the reliability of system. Good design practice should attempt to take this into consideration. The code requirement as currently written does not allow a designer to make these decisions.
4) Coordination of devices in most systems when all faults are considered. Specifically low to high magnitude single or three phase faults and zero sequence faults (ground faults), regardless whether circuit breakers or fuses are used.
5) The committee is unsure as to which proposal the submitter is referring to.

1 NFPA 70, Article 110.16, Flash Protection

Ballot Results:
Affirmative: 8 Negative: 5
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative:
ELKINS, D.: See my explanation of Negative on Comment 13-177 (Log #1340).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
ZGONENA, T.: See My Explanation of Negative on 13-175.

13-202 Log #1786 NEC-P13  Final Action: Reject

Submitter: Joseph A. Hertel, Safety and Buildings
Comment on Proposal No: 8-95
Recommendation: I agree with the proposal and the CMP should reconsider their actions.
Substantiation: The CMP rejected the proposal and should reconsider in the comments. Panel comments indicate that selective coordination is a design consideration and they should be reminded that the NEC is not a design manual. We have seen faced situations where it is not possible to comply with the NEC requirement for selective coordination. As an AHJ we have allowed installers, designers and owners to comply “to the extent possible” with available equipment. While I agree selective coordination is an ideal installation it is not at this time practical for all installations.

Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
Explanation of Negative:
NASBY, J.: See NEMA Explanation of Negative on 13-204.

Comment on Affirmative:
ZGONENA, T.: Since the comment refers to an incorrect proposal number, the comment was justified in rejecting the comment, however, it is assumed the comment was with respect to selective coordination, and we agree with the comment itself if considered with respect to section 700.27 - see comment on 13-175.
Ground-fault protection, where none is required on the emergency system

The panel should reconsider the action taken on this proposal and the

1) The State of Washington has amended the Selectivity requirement in the

and it is easy to recognize enhancements in performance and reliability with

compliant with NEC 700.27. There is no safety or performance compromised

permit appropriate latitude to comply with NFPA 110 even though they are not

having to address designs through 90.4 by getting permission from the AHJ to

recognizing that the 2005 NEC is more restrictive than necessary and are

additional isolation is gained in the system. The 2005 NEC fails to address this

3) The inspection community in plan review has recognized this challenge as

flash and simply ignores the unnecessary increase in the size of equipment and

source but may be found on the normal source. Hence a small ground fault can

legally required standby system to be code compliant even if they are unable

unable to start but they are NEC compliant, permitting exhaust fans in the

selective coordination and the lights dim and drop out computer systems. 100 that provides the engineer the necessary latitude to choose the appropriate

devices to be selective is an over design for the system, which is recognized by

overcurrent devices and system configuration. Requiring all overcurrent

device to coordinate with downstream overcurrent devices.

3) The NEC. The panel did not comment on the additional restriction in NEC 700.27 that

requires all devices to be selective as compared to the definition in Article

100 that provides the engineer the necessary latitude to choose the appropriate

devices to be selective is an over design for the system, which is recognized by

the NEC for enhanced safety and reliability? 13-137

Recommendation: I disagree with the panel action. Accept Proposal 13-137 as

written.

Substantiation: NEMA strongly supports selective coordination as a valuable

safety asset in the current range where overloads most often occur. However,

NEMA does not support the mandate for Selective Coordination for ALL

current ranges and ALL overcurrent devices because safety and reliability can

both actually be diminished. This is due to increased hazardous arc flash

energy with increased equipment damage and potential fire initiation, decreased

reliability, and extended downtime before service restoration. Mandates for

selective coordination for ALL current ranges and ALL overcurrent devices

will not always provide the optimum safety solution or optimum reliability.

Such a solution requires the expertise and judgment of a Professional Engineer

who can balance the design, safety and operating requirements in order to

determine the optimum design for each specific facility.

Selective coordination is a system design issue, not a Code issue.

The wording of this section states the ALL overcurrent devices selectively

coordinate, but this is not what the definition Article 100 implies. The
definition deals with localization of an overcurrent and, in many cases,

selective coordination for ALL overcurrent devices serves no useful

localization purpose such as when: 1) Overcurrent devices are located on the

primary and secondary sides of a low voltage transformer with no loads in

between. A feeder overcurrent device is coordinated in series with the main

overcurrent device in a downstream panelboard with no loads in between. 3) An

overcurrent device on a generator is in series with an overcurrent device in a

switchboard with no loads in between. In these instances, requiring both
devices to be selectively coordinated does not add to the reliability of the

system, which is the stated objective of the CMP.

When overcurrent devices are located on the primary and secondary

sides of a low voltage transformer, sized to meet the NEC transformer

protection requirements, it is almost impossible to also meet the

requirement for selective coordination of this section, regardless of the type of

overcurrent protective device chosen.

In many instances, it may be impossible to meet the requirements for
generator protection provided by an overcurrent device located on or near the
generator and provide selective coordination with downstream overcurrent
devices. Further, the generator protection functions provided within the engine-
generator controller by the manufacturer might not be able to selectively

directly and with downstream overcurrent devices.

The paralleling of generators is often done to enhance system reliability,

which is the stated objective of the CMP, however, in order to meet the

requirement for selective coordination each generator overcurrent device and

other must selectively coordinate with all downstream overcurrent devices.

This may not be possible if the generators are of unequal size.

The upgrade or expansion of an existing building may require the

replacement of existing upstream equipment so that it will selectively

coordinate with the new downstream equipment it must feed. The State of

Washington has recognized the significant economic burden this is placing on

building owners and businesses and has issued an emergency order exempting

existing buildings from meeting the selective coordination requirements of

the 2005 NEC.

Systems are normally designed for selective coordination in the overload

region of the overcurrent device time-current curves. If this were not so, they

would not provide any protection under any conditions, so what is required is

being called for in this requirement is overload and short circuit selective coordination. In order to

achieve total short circuit selective coordination, the size of upstream

overcurrent protective devices may need to be increased and/or time delay trip

characteristics increased, thereby possibly increasing the arc flash hazard. In

other words, by forcing selective coordination for an event that most likely will

never occur, namely a bolted fault, the hazards involved in performing tasks

which most likely will occur, namely system maintenance, may be increased.

Further, another reason why the designers need to optimize the design of a system, which the current requirement does not allow.

As stated in the original NEMA substantiation to delete this text in proposal 13-137, we wish to once again point out the following:
1. The need for the flexibility to optimize the design of a system is recognized in IEEE Standard 242-2001 (The Buff Book). Section 15.1 states, “In applying protective devices, it is occasionally necessary to compromise between protection and selectivity. While experience may suggest one alternative over another, the preferred approach is to favor protection over selectivity. Which choice is made, however, is dependent on the equipment damage and the affect on the process.”

2. The need for the flexibility to optimize the design of a system is also recognized in NFPA 110-2005, Standard for Emergency and Standby Power Systems. Section 6.5.1 states, “The overcurrent protective devices in the EPSS shall be coordinated to optimize selective tripping of the circuit overcurrent protective devices when a short circuit occurs. A further explanation of this statement is given in Annex A section A.6.5.1. “It is important that the various overcurrent devices be coordinated, as far as practicable, to isolate faulted circuits and to protect against cascading operation on short circuit faults. In many cases, however, all coordination of all practicable types of equipment that could be prohibitively costly or undesirable for other reasons.”

3. This NEC text conflicts with Chapter 27 of the International Building Code that specifically requires compliance with NFPA 110 for emergency systems. This presents a conundrum for the system designer and the AHJ. Which code takes precedence, the IBC or the NEC?

In summary, NEMA strongly supports selective coordination as a valuable safety asset in the current range where overloads most often occur. However, NEMA does not support the mandate for Selective Coordination for ALL current ranges and ALL overcurrent devices because safety and reliability can both actually be diminished, thus the section should be deleted.

Panel Meeting Action: Reject
Panel Statement: The overriding theme of Articles 700 and 701 is to keep the power on throughout an emergency situation, for life safety. Selective coordination increases the reliability of the emergency system. Selective coordination is essential for the continuity of service required in emergency and legally required emergency circuits.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).
NASBY, J.: See NEMA Explanation of Negative on 13-204
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
WOOD, T.: See My Explanation of Negative on Comment 13-204.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-206 Log #2194 NEC-P13 Final Action: Reject (700.27)

"TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Peter R. Walsh, Peter R. Walsh, P.E. & Associates

Comment on Proposal No: 13-137
Recommendation: The Panel should continue to reject this Proposal.

Substantiation: The NEC has required selective coordination for elevator circuits for years without major problems. The recent expansion of requirements makes good sense for the users of the buildings. Who wants to suffer from a blackout as a result of non-selective coordination? Engineers have software programs, like Easy Power Version 8.0 that can automate selective coordination.

With Zone Selective Coordination trips, almost anything can be coordinated. Arc flash can be adjusted by proper trips. The code making panel should require reliable power through selective coordination of emergency circuits.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).
NASBY, J.: See NEMA Explanation of Negative on 13-204
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
WOOD, T.: See My Explanation of Negative on Comment 13-204.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-207 Log #2242 NEC-P13 Final Action: Reject (700.27)

"TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Charles Fuellgraf, Fuellgraf Electric Company

Comment on Proposal No: 13-137
Recommendation: We respectfully wish to comment and express our support for Proposal 13-137 and Proposal 13-159 which would reestablish the requirements for Selective Coordination.

Substantiation: We absolutely support selective coordination in lower current ranges. This is essentially where all faults and overloads occur, and the system design engineers practice selective coordination to protect for any such occurrences.

Going to a "total" system coordination can bypass the expertise and judgment of the knowledgeable engineer and contribute to escalated dangers from the various hazards of high energy levels. This can lead to increased risks to operating personnel, plus additional costs of equipment and associated labor.

Thank you for the opportunity to make these remarks which we feel are in the best interests of our industry and those exposed to it.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).
NASBY, J.: See NEMA Explanation of Negative on 13-204
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
WOOD, T.: See My Explanation of Negative on Comment 13-204.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-208 Log #2310 NEC-P13 Final Action: Reject (700.27)

"TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: David Beach, Gresham, OR

Comment on Proposal No: 13-137
Recommendation: The proposal should have been Accepted.

Substantiation: This requirement was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an
attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases foregoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the arc flash hazard; is that truly in the interest of safety?

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

Ballot Results:

Number Eligible to Vote: 14

Ballot Results: Affirmative: 8 Negative: 5

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: David Beach, Gresham, OR

Final Action: Reject

Comment on Proposal No: 13-142

Recommendation: The proposal should have been Accepted.

Substantiation: This recommendation was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases foregoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the arc flash hazard; is that truly in the interest of safety?

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-210 Log #2312 NEC-P13 Final Action: Reject

(700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: David Beach, Gresham, OR

Comment on Proposal No: 13-142

Recommendation: The proposal should have been Accepted.

Substantiation: This recommendation was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases foregoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the arc flash hazard; is that truly in the interest of safety?

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 8 Negative: 5

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

Ballot Results:

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-212 Log #2341 NEC-P13 Final Action: Reject

(700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 13-137

Recommendation: Recommend and accept in principle proposal 13-137. Delete the present text and replace with revised language as noted in proposal 13-137 that parallels NEC 110.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

Ballot Results:

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-214 Log #1498 NEC-P13 Final Action: Accept

(700.27)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: James S. Nasby, Master Control Systems, Inc.

Comment on Proposal No: 13-137

Recommendation: Continue to REJECT this proposal.

Substantiation: The submitter seeks an exception to allow the use of molded case circuit breakers. The presumption must be drawn that molded case circuit breakers are not capable of selective coordination.

I believe that molded case circuit breakers are available which will allow said coordination.

I believe that normal power distribution schemes often make use of molded case circuit breakers and that such systems are typically coordinated.

Submitter: David Beach, Gresham, OR

Comment on Proposal No: 13-142

Recommendation: The proposal should have been Accepted.

Substantiation: This recommendation was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases foregoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the arc flash hazard; is that truly in the interest of safety?

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 13-204.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.
Circuit breaker systems

NASBY, J.: See NEMA Explanation of Negative on 13-177 (Log #1340).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

Terminal: 13-250 Log #898 NEC-P13

Final Action: Reject (700.27)

TCC Action: The Technical Correlating Committee directs that this comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Surefun Sundt, USACE

Comment on Proposal No: 13-137

Recommendation: I disagree with the panel action. Accept Proposal 13-137 as written.

Substantiation: Instead of mandating. Please clearly state your objective in NEC – which will act as a guide for the designer to consider. There are simply too many different systems requiring different design approach. It becomes more difficult to pick up one manufacturer in the government where one has to be fair in awarding contracts.

Or, otherwise, show your requirements graphically instead of verbiage in NEC. Procedures should be to provide accurate guidance rather than ambiguous interpretations.

Panel Meeting Action: Reject


Number Eligible to Vote: 14

Ballot Results: Affirmative: 8 Negative: 5

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.


ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Terry MacAlthy, Consulting Engineer, LLC

Comment on Proposal No: 13-147

Recommendation: Continue Rejecting this Proposal.

Substantiation: I have worked for manufacturers of circuit breakers, fuses and electrical utilities. Now, I am a consultant working with industrial and large commercial accounts. I have been involved in development and testing of CBs and fuses and in the field. I work with electrical engineers and maintenance people. This proposal is based on the premise that circuit breaker systems can be safely restored to power faster than fusible systems and, therefore, the selective coordination requirement should be ignored for molded case circuit breakers. This premise should not be accepted for several reasons including:

1. Since the 2005 NEC, the circuit breaker manufacturers have published selective coordination charts for molded case circuit breakers and numerous application materials recommending selective coordination.

2. A selectively coordinated system reduces the amount of circuits that have to be restored. If a system is selectively coordinated, only the closest upstream overcurrent protective device will open for any overcurrent. There is not an issue about speed of isolation of power for the non-affected portions of the system because selective coordination prevented unnecessary outages. In time of emergency, there is great value to not have unnecessary outages; peoples’ lives may depend upon it. Also, restoration of power will occur quicker since the electrical does not have to spend a large amount of time troubleshooting and restoring circuits that were unnecessarily disrupted.

3. For the portion of the system that does rightfully get interrupted by the opening of the nearest upstream overcurrent protective device, there is an electrical reason of opening of this circuit. Proper work practices are required for investigating the cause, rectifying/repairing the circuit, and restoration of the power. To ignore proper work procedures can imperil electrical workers as well as building safety. In spec situations, fuses may permit faster restoration of power and in some cases, circuit breakers may permit faster restoration of power. For instance, it is against the federal law per OSHA regulation 1910.334(b)(2) to merely reset a circuit breaker or replace fuses “until it has been determined that the equipment and circuit can be safely reenergized.” The proper manual closing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.” Also, circuit breaker manufacturer’s operational manuals advise against merely resetting circuit breakers that have interrupted a fault at or near a circuit breaker’s interrupting rating. NFPA 70E requirement 225.3 “Circuit Breaker Testing. Circuit breakers that interrupt faults approximating their ratings shall be inspected and tested in accordance with the manufacturer’s instructions.” Of special note! A phase to ground fault which is the most common begins as high as 8,000 to 10,000 amperes, the UL listed phase to ground test listing on many commonly used molded case breakers, may seriously damage a three pole breaker with a three phase fault rating of 65,000 amperes rendering the breaker unsafe for further operation.

The lower level phase to ground fault is more difficult to visually detect and should be the first on site investigation in addition to overload. The accepted procedures would be to take this breaker out of service and send it back to the manufacturer for testing and try to find a replacement.

4. Rejection Style Fuses are devices that when they open, will be replaced by the same rejection case size and interrupting capacity to restore power. Proper amperes spare fuses normally are stored on site, but these rejection style fuses are a common stock item in local electrical distribution inventory and are readily available. This is not the case for most 480 volt breakers of mid to high interrupting capacity. Rarely are these breakers available except from the manufacturer which can cause excessive down time. Ensuring proper spare fuses on site is an important responsibility for the facilities management. Fuse specifications typically prefer fuses because of their inherent reliability and knowledge that when the circuit protection is restored, the protection level is as originally specified. On the other hand, it cannot be assumed that circuit breakers translate to faster power restoration just because they are resettable. Circuit breakers that have interrupted a circuit should be inspected, tested and possibly replaced. This occurrence depends on the ongoing circuit breaker maintenance practices, history/condition of the circuit breaker, and level of interruption. Molded case breakers are not routinely inspected and maintained in institutional, industrial or governmental installations.

5. Branch circuit over currents typically are overloads or faults (which includes ground faults). My experience is that feeder and main overcurrent protective devices must often open because of phase faults. When an overcurrent protective device opens because of a fault, then the circuit has to be investigated and the fault cause found and remedied. Rarely will this be a fast (matter of a couple of minutes) process.

6. Molded case circuit breakers are not fault current rejection by frame size as well as in some cases voltage rejection by frame size. My recent and past experience is this is a serious problem when there is either breaker failure replacement or additional breaker circuit additions in the field. I have dealt with many hospitals, facilities and institutions facing many interruptions and power outages due to breakers with fault capacity less than available fault values and in one case a 208 volt rated breaker on a 480 volt system causing a major Arc Fault and hospital shut down. In the last few months, site visits on new nuclear industrial facilities and additions at a large data center disclosed breakers with interrupting capacity than the available fault were mixed in with the proper capacity breakers from the factory. Field changes allowed non-rejection fault interrupting breakers that are interchangeable, which other than the fine print, to become a potential serious problem to the installed equipment, down time and possible injury to the electrical worker.

7. Molded case breakers and fuses may be engineered to provide selective coordination if the engineering work is accomplished at the time of design or before purchase of critical circuit electrical equipment. Selective coordination is a fault isolation at the point of fault without negatively affecting the rest of the system. To rely on the resetting of an overcurrent device as a procedural process is against standard safe procedures per OSHA, NFPA 70E, overcurrent manufactures recommendations and common sense. I am not aware of one breaker or fuse manufacturer that will recommend this procedure in writing without a number of exceptions that would keep them out of litigation.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 8 Negative: 5

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.:See my Explanation of Negative on Comment 13-177 (Log #1343).

NADIM, B.: See NEMA Explanation of Negative on 13-204.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My Explanation of Negative on Comment 13-204.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-215 Log #2230 NEC-P13

Final Action: Reject (700.27 Exception (New ))

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Steven R. Terry, Electronic Theatre Controls Inc.

Comment on Proposal No: 13-150

Recommendation: Change proposed wording to be added as a last sentence of 701-459 as follows, including renumbering of sections.

Automatic Transfer Switches, rated at 600 VAC and below and utilized to transfer feeders or branch circuits between two separate, non-synchronized power sources, shall be listed for legally required standby system use.

FPN: The standard for listed Automatic Transfer Switches in ANSI/UL 1008,

Substantiation: The submitter of this proposal is precisely correct in his substantiation, but the proposal does not go far enough in helping to prevent misapplication of inappropriate devices as transfer switches. The original proposal asked that Automatic Transfer Switches be listed “for legally required
standby load use. Unfortunately, recent experience has shown that stand-
alone Load Control Relays that have a perfectly valid emergency listing under
UL 924, (Emergency Lighting and Power Equipment), are being misapplied
as branch circuit Automatic Transfer Switches, where UL 1008 devices should
in fact be used. These misapplied Load Control Relays are being used to
transfer a load between two non-synchronous power sources, but they are
not subject to any of the stringent requirements of UL 1008 that are needed
for this application, such as fault current testing and mechanical interlock
to prevent inadvertent connection of the two power sources. Thus, “listed for
legal” does not adequately clarify the listing requirements for transfer switches.

The misapplication of non-UL 1008 devices is happening for the following
reasons:

A. The NEC is silent in Article 701 on what equipment is required to transfer
a branch circuit between two non-synchronous power sources. NFPA 110 is
similarly silent on this issue. Automatic Transfer Switches are most commonly
used as feeder-level devices. Therefore, installers and engineers are often
unaware that devices used to transfer branch circuits are subject to similar
switching phenomena as simple devices such as circuit breakers. This can lead
them to incorrectly assume that devices used to transfer branch circuits need not be UL 1008 listed Transfer Switches.

B. Branch Circuit Automatic Transfer Switches listed under UL 1008 are
relatively new devices, as is the concept of transferring single or multiple
branch circuits between utility and alternate standby power sources. Previously,
this type of transfer was almost always handled by an upstream feeder-level UL 1008
transfer switch.

C. Stand-alone Load Control Relays (LCRs) listed under UL 924 have
recently become available. These are typically double-pole, double-throw
devices, but single-pole, double-throw and single-pole devices also exist. They are intended only for load energization during loss of utility
power, that is accomplished by performing a bypass of the wall switch or
dimmer controlling the branch circuit. In this case, an upstream UL 1008
transfer switch is doing the actual transfer from normal to alternate standby
power. However, engineers and installers often incorrectly assume that these
UL 924 devices can be used to actually transfer the branch circuit load between
normal and alternate standby power.

This situation is not helped by the fact that some manufacturers of these
device have produced data sheets that can be misleading, and do not
specifically prohibit this type of transfer. Presumably, this is because no standard,
including the NEC, speaks directly to the requirements of this
relatively new branch circuit transfer application. UL has publicly asserted
that UL 924 Load Control Relays are not to be used to transfer a load between
two non-synchronous power sources, and that only a UL 1008 device is
suitable for this application. In the September 2005 issue of “The Code Authority”
(UL’s newsletter on Code issues), the article “Focus on Emergency Lighting
Equipment” appears on page 3. That article states:

“An important issue to recognize is that a LCR does not switch the load
between the normal and emergency supplies. Load switching of this type should
only be performed by a transfer switch listed in accordance with UL 1008.
Standard for Safety for Transfer Switch Equipment.”

This statement by UL also applies to legally required standby systems,
because the application of transferring between two non-synchronous power
sources is the same for emergency and legally required standby systems. The
proposed revised wording above would accomplish the following:

1. Require all Automatic Transfer Switches to be listed.
2. Clarify that a listed ATS is required when it is applied either in feeders or
in branch circuits, if the application is transferring a load between two non-
synchronous power sources.
3. Provide an informative FPN to point the reader to the applicable standard
for Automatic Transfer Switches.

Panel Meeting Action: Reject
Panel Statement: The additional text “... and utilized to transfer...” would add confusion. The FPN is already covered in Annex A. Listed transfer switches are required according to the action on Proposal 13-150.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1


Comment on Affirmative:

13-216 Log #92340 NEC-P13
Final Action: Reject
(701.7(C)(1))

Submitter: Alan Manche, Square D Company
Comment on Proposal No: 13-150
Recommendation: Reconsider and Reject Proposal 13-150.
Substantiation: There has been no substantiation presented that equipment failure is an issue where appropriately rated and installed electrical equipment is used. The proposed text only requires a transfer switch to listed, which is only one of many solutions for transferring power to alternate sources. Multiple switchboards from multiple manufacturers are often employed in large facilities to control the power from multiple power sources. It is not reasonable to require such an installation to have equipment that is specifically listed for the transfer or paralleling of sources.

Let’s specifically review the submitter’s substantiation:

1) “When the two power sources are not synchronized, as much as twice
rated voltage may be seen across the transfer switch contacts.” This particular
issue does not exist where the transfer equipment or transfer switch is
considered to be a break-before-make configuration. A simple delay between
breaking on source and closing on the other addresses this issue. So this
substantiation simply inaccurately restricts existing products and technology
that is safely used today.

2) “If a transfer switch is used, possible uncoordinated overcurrent protection may
exist should the transfer switch close into a short circuit.” This particular test is
found in almost all product standards for equipment, however, we still do not
require a switchboard, panelboard or circuit breaker to be listed which is just
as critical and where this condition is more likely to encounter in the electrical
system. NFPA 110 is the substantiation of a safety issue exists today? Why is
the panel moving to potentially exclude product and system solutions that are
safely being used today with no reported incidents?

3) “The recognized national standard for testing Automatic Transfer Switch Equipment is ANSI/UL 1008.” The panel should also note that number of other product standards address the issues above including UL 67, UL 98, ad UL 891
to name a few. It should be noted that automatic transfer functionality is often
embedded in panelboards and switchboards as a secondary function and may
not be specifically listed to UL 1008 and still perform safely.

4) “This proposed requirement as placed under 701.7(C) would specifically apply
only to automatic transfer switches. The intent is to not rule out types of
transfer system transfer equipment identified for emergency system use
and acceptable to the AHJ under 700.6(A).” If the intent of the committee is
to place this restriction only on transfer switches and not require listing on
other viable options that are currently safely in use today, then a second sentence
should be included to clarify that point. “This listing requirement is specific to
transfer switches and is not intended to exclude other approved
transfer equipment configurations.”

The panel should reconsider the lack of substantiation and consider the
broader applications of products that control the electrical system. The panel
must consider the restriction being placed on the user by requiring listing
which inherently will exclude safe product solutions and unnecessarily added
cost to products without any substantiation that safety will be enhanced by
requiring listing. Proposal 13-150 should be rejected.

Panel Meeting Action: Reject

Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Gustafson, R.


13-217 Log #1304 NEC-P13
Final Action: Reject
(701.11(A))

Submitter: David Sroka, Turner Falls, MA

Comment on Proposal No: 1-54

Recommendation: Add a sentence as follows:

“The short-circuit current rating shall be included on the nameplate for
battery inverters.”

Substantiation: This data is hard to obtain after the original installation. It
is important information. The nameplate is the best place for the equipment’s
rating. Circuit breaker, fuse or transfer switch rating can mistakenly be taken as
the unit’s rating. Lastly, it is safest to read the nameplate to get this information
rather than physical removal of covers.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 13-167.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Negative: 1

Ballot Not Returned: 1 Gustafson, R.

13-218 Log #2118 NEC-P13
Final Action: Accept in Principle
(701.11(B)(5) New)

Submitter: Mark R. Hilbert, Wolfeboro, NH
Co) "Use on Proposal No: 13-150
Recommendation: Accept the Proposal.

Substantiation: The new FPN was not intended to identify that the
disconnecting means which is the subject of 701.11(B)(5) must disconnect
the “service.” The FPN is necessary to identify to users of the NEC that
this disconnecting means must be clearly identified as suitable for use as service equipment.

As described in Article 100, conductors supplying a building or other structure from a generator are “feeder” conductors. Seeing that the generator is outdoors,
the conductors are “outside feeder conductors” and, therefore, they are included in the scope of Article 225. Section 225.31 requires that a disconnecting means be provided to disconnect all conductors that supply or pass through a building or structure. Section 701.11(B)(5) amends the requirements of 225.32 to locate the disconnecting means required by 225.31 at the building or structure served, however, it does not amend the requirements of 225.36 for it to be “suitable for use as service equipment.” This requirement is often overlooked and the proposed FPN would go a long way towards identifying that there is another requirement in 225.36 that must be considered. Panel Meeting Action: Accept in Principle
Panel Statement: The panel evaluates the comment and states that the proposed wording will add confusion.

Submitter: Mark R. Hilbert, Wolfeboro, NH
Comment on Proposal No: 13-154
Recommendation: Accept the Proposal. Substantiation: This requirement should be added as the purpose of the FPN is to direct readers of this section to a requirement that is not obvious. The grounding and bonding conditions when the disconnecting means is remote from the building or other structure it is supplying are often misunderstood and, therefore, this would be an appropriate location for a FPN providing direction to the location of the requirement. In the ROP stage, Panel 5 accepted a proposal to 250.32(D) to include a reference to 701.11(B)(5) to identify that the requirement of that section apply to the condition of 701.11(B)(5). It would be prudent to locate a FPN here to reference 250.32(D).

Panel Meeting Action: Accept in Principle
Panel Statement: The panel reaffirms their statement on Proposals 13-154 and 13-130. The panel believes that the addition of the FPN is unnecessary.

13-220 Log #2177 NEC-P13 Final Action: Reject (701.11(B)(5), FPN (New ))

Submitter: Mark R. Hilbert, Wolfeboro, NH
Comment on Proposal No: 13-154
Recommendation: Accept the Proposal. Substantiation: This proposal should be added as the purpose of the FPN is to direct readers of this section to a requirement that is not obvious. The grounding and bonding conditions when the disconnecting means is remote from the building or other structure it is supplying are often misunderstood and, therefore, this would be an appropriate location for a FPN providing direction to the location of the requirement. In the ROP stage, Panel 5 accepted a proposal to 250.32(D) to include a reference to 701.11(B)(5) to identify that the requirement of that section apply to the condition of 701.11(B)(5). It would be prudent to locate a FPN here to reference 250.32(D).

Panel Meeting Action: Accept in Principle
Panel Statement: The panel reaffirms their statement on Proposals 13-154 and 13-130. The panel believes that the addition of the FPN is unnecessary.

13-221 Log #462 NEC-P13 Final Action: Reject (701.11(E))

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 13-157
Recommendation: Accept proposal revised: Except at the point of supply, the legally required standby service shall be sufficiently separated from the normal or other service to prevent simultaneous interruption of supply. Substantiation: “Normal” is not defined. If a structure is served by a single-phase and three-phase service, which is normal, one or both? Service is defined as including conductors and standby service conductors connected to “normal” service conductors are not “separated.” Simultaneous interruption cannot be prevented. Only minimized, as specified in (D) and 695.3(A)(1) and 700.12(D)(2). Separation should be required from any other service since whether “normal” or not an occurrence could also affect the legally required standby service if not separated.

Panel Meeting Action: Reject
Panel Statement: The panel believes that the current wording is clear and the proposed wording will add confusion.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-222 Log #2049 NEC-P13 Final Action: Accept (701.17)

“TCC Action: The Technical Correlating Committee understands that the comment recommendation was to continue to reject Proposal 13-158, but actually addressed the text in 701.17 and not 701.17 as indicated in the comment.

Submitter: Hugh O. Nash, Jr., Nash Lipsey Burch
Comment on Proposal No: 13-158
Recommendation: Continue to reject 13-158 which applies to 700.17 Ground-Fault Protection. Substantiation: Regardless of the size of the alternate source, ground-fault interruption of the alternate source overcurrent device can cause interruption of the alternate source feed to critical equipment. This is of particular concern to healthcare facilities. The panel statement (reason for reject) states: “Automatic disconnecting may be provided but is not required.” In healthcare facilities, automatic disconnecting may not be provided under any circumstances. 517.17(B) states, “The additional levels of ground-fault protection shall not be installed as follows: (1) on the load side of the essential electrical system transfer switch. (2) Between the onsite generating unit (as) described in 517.35(B) and the essential electrical system transfer switch(es)”

For many years, the NEC warned the user against placing GFP interruption between the alternate source and the transfer switch(es). This warning has now become a prohibition. There are documented instances where GFP interrupted the normal source and the alternate source, leaving critical care areas without normal or alternate power.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13
Ballot Not Returned: 1 Gustafson, R.

13-175 Log #2314 NEC-P13 Final Action: Reject (701.18)

“TCC Action: The Technical Correlating Committee does not agree with the panel statement. The submitter of the comment did correctly identify the proposal number and the paragraph of the document to which the comment was directed.

Submitter: David Beach, Gresham, OR
Comment on Proposal No: 13-159
Recommendation: The proposal should have been Accepted. Substantiation: This requirement was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases foregoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the ar flash hazard; is that truly in the interest of safety?

Panel Meeting Action: Reject
Panel Statement: This comment does not comply with 4.4.5 of the NFPA Regulations Governing Committee Projects in that it does not identify the document or proposal number to which the comment is directed and the paragraph of the document to which the comment is directed.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 10 Negative: 3
Ballot Not Returned: 1 Gustafson, R.
TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Kevin J. Lippert, Eaton Corporation

Comment on Proposal No: 13-159

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative: I disagree with the Panel Action. Accept Proposal 13-159 as written.

Substantiation: The Panel statements during the 2005 revision cycle, and as stated in the 2008 ROP, indicate that CMP-13’s intent for these circuits is to mandate selective coordination of ALL overcurrent devices, across ALL current ranges. This initially appears to support CMP-13’s stated goal of increasing safety and reliability of the electrical system. However, an in-depth analysis reveals that it is not ALWAYS the case! There are circumstances where overcurrent devices (both fuses and circuit breakers) selected specifically to comply with the 2005 NEC mandate, will have the unwanted consequence of substantially increasing the hazardous arc flash energy with corresponding increased equipment damage and potential fire initiation with associated decreased reliability, and extended downtime before service restoration. This mandate also eliminates the Professional Engineer’s expertise and judgment from determining the optimum design for each specific facility by balancing design, safety and operating requirements. Furthermore, selective coordination is a system design issue, not a Code issue.

Eaton strongly supports selective coordination as a valuable safety asset in the current range where overloads most often occur. However, Eaton does not support the mandate for Selective Coordination for ALL current ranges because safety and reliability can actually be diminished.

Alternatively, CMP-13 could choose to make this a FPIN, similar to the 2002 NEC FPIN to 700.25, and advising that selective coordination MAY increase overall reliability of the system.

Panel Meeting Action: Reject

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: John Cool, PowerPlus Engineering Inc

Comment on Proposal No: 13-159

Recommendation: The Technical Panel should continue to reject this proposal.

Substantiation: The present selective requirement for legally required standby systems is supported by code safety and maintaining power to important loads upon the loss of the normal power source. Selective coordination is an achievable requirement that provides loads power for the maximum time. Without selective coordination, a branch or feeder fault may unnecessarily take out the entire system or a major portion of the system. This could unnecessarily imperil lives. The present requirement is not in conflict with NFPA 110.

However, the scope of NFPA 70 is more comprehensive than NFPA 110. NFPA 110 covers from the emergency power source to the transfer switch and NFPA 70 has an entire system. We have designed many facilities and can engineer the system for selective coordination. There definitely are issues that must be analyzed, but with proper analysis and specification flexibility this selective coordination requirement is achievable. We have found that systems can be designed using fusible or circuit breakers equipment.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-228 Log #952 NEC-P13 Final Action: Reject

(701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: John Cool, PowerPlus Engineering Inc

Comment on Proposal No: 13-159

Recommendation: The Technical Panel should continue to reject this proposal.

Substantiation: The present selective requirement for legally required standby systems is supported by code safety and maintaining power to important loads upon the loss of the normal power source. Selective coordination is an achievable requirement that provides loads power for the maximum time. Without selective coordination, a branch or feeder fault may unnecessarily take out the entire system or a major portion of the system. This could unnecessarily imperil lives. The present requirement is not in conflict with NFPA 110.

However, the scope of NFPA 70 is more comprehensive than NFPA 110. NFPA 110 covers from the emergency power source to the transfer switch and NFPA 70 has an entire system. We have designed many facilities and can engineer the system for selective coordination. There definitely are issues that must be analyzed, but with proper analysis and specification flexibility this selective coordination requirement is achievable. We have found that systems can be designed using fusible or circuit breakers equipment.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITFDALL, H.: See my explanation of negative vote on Comment 13-178.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-229 Log #1158 NEC-P13 Final Action: Reject

(701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Robert Gustin, Eaton Corporation

Comment on Proposal No: 13-159

Recommendation: Disagree with the panel action. Accept Proposal 13-159 as written.

Substantiation: For over a hundred years, power system engineers have been trained to understand and design power systems balancing the need for protection with continuity of service (coordination). In one stroke, requirement has legislated a mandate to ignore any protection involved in emergency circuits. Since the NFPA sponsors the NEC as a fire protection document, it is beyond belief that this requirement has been mandated since its definitive results are:

- longer arc fault burning times
- higher heats of release from burning copper and metal
- higher possibility of building burn downs
- higher possibility of danger to human life

Beyond that, this requirement ignores real life designs that would in many cases make its compliance impossible. For example, today’s manufacturer’s of ATSs typically comply with UL standards for withstand ratings of 3 cycles. Any breaker or fuse feeding an ATS in an emergency circuit would have to trip in less than 3 cycles. For breakers, that is tantamount to requiring an instantaneous trip. That instantaneous tripping would end coordination 10X of breaker rating - a 600 amp breaker would have no coordination for currents in excess of 6000 amps. For any major building in America, that is a fraction of the available fault current - therefore you cannot achieve both the protection required for the ATS and full coordination.

This is just one of many examples of applications this requirement simply ignores. There are ground fault issues; double ended substation issues whereby this requirement would make the normal loads’ main breakers dramatically increase their tripping times resulting in much higher arc flash values and burn times and many others. This issue and its ramifications needs careful study and analysis before any such requirement should be made.

Panel Meeting Action: Reject


Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-178.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-230 Log #1177 NEC-P13 Final Action: Reject

(701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Athanasios Papademos, Albert Kahn Associates, Inc

Comment on Proposal No: 13-159

Recommendation: I disagree with the panel action. Accept Proposal 13-159 as written.

Substantiation: The addition of 701.18 in the 2005 NEC was instituted without the substantiation of any real world problem. It resulted in an immediate uproar from the electrical industry with regards to its effect on substations. There is a general view that increasing energy to feed arc flash events and properly engineered coordination. The “substantiation” provided in Proposal 13-159 correctly identifies the concern with and the undesirable results of full compliance with 701.18. No less than 9 proposals (13-159 through 13-167) have been submitted by individuals such as contractors, manufacturers, consulting engineers, and code and Technical Committee members requesting its revision. It seems that Panel 13 has summarily dismissed all comments from the industry on a section of the code whose creation was based on something other than needs dictated by the real world. As stated in many of the referenced proposals, electrical coordination is a design issue; the NEC is not a design instrument, but 701.18 dictates it be used as such. The contradictions of the intent of 701.18 with other industry standards PLUS the lack of any standard for determining when a system is totally selectively coordinated should be a minimum, result in delaying the implementation of 701.18 until such time that the industry’s concerns are addressed.

Panel Meeting Action: Reject


Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITFDALL, H.: See my explanation of negative vote on Comment 13-178.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-231 Log #1277 NEC-P13 Final Action: Reject

(701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Camilo Martinez-Angulo, AmpSafe, LLC

Comment on Proposal No: 13-159

Recommendation: Proposal 13-159 should continue to be rejected by the Panel. The Panel should continue to require selective coordination for legally required standby systems.

Substantiation: I am a consulting engineer with considerable experience dealing with overcurrent protection and selective coordination. It has been my experience that selective coordination is almost always achievable with relays, circuit breakers, current limiting fuses, or combinations of these devices. Depending upon the type of switchgear and the available short circuit current, I may specify adjustable instantaneous trips, electronic trips and/or short time delay. Whenever the short time delay causes the arc-flash energy to get out of hand, I specify zone selective interlocking to minimize the hazard. I will typically specify two levels of ground fault protection whenever the feeder devices are larger than about 200 amperes, so selectively coordinating with ground fault protection has not really been a problem. I find that the main purpose of Articles 701 and 701 is to maximize continuity of service so I find it odd that users are trying to figure out ways to eliminate the requirement from the NEC. To me, this requirement for selective coordination is an absolute necessity when it comes to emergency systems and legally required standby systems. It takes work and engineering knowledge/experience to selectively coordinate an electrical distribution system without compromising safety and protection and that’s what we’ve been able to do.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
Most faults have enough resistance to limit the amount of current that.

Ballot Results:
Panel Meeting Action: Reject

to fully coordinate under those circumstances requires burdensome evaluations
unregulated manufacturer testing to determine if devices selectively coordinate
selectively coordinated to a substantial degree. It negates the need to rely on
emergency power systems through selective coordination.

Substantiation:
Selective coordination for low current magnitudes will in most
cases provide the required selective coordination without sacrificing the best
possible protection. The decision as to when total protection is required should
be left up to the design Professional Engineer based on the type facility and
detailed analysis of the electrical system emergency system. Additionally, such
total coordination will have a potential to: decrease safety due to increased arc
flash hazard, decrease overall system reliability, increase downtime, increase
equipment sizing and increase equipment cost. Further, the rare nature of large
current faults would render the need for total coordination seldom of value.
Selective Coordination of low current devices will provide optimum protection and
its application should be left to Professional Engineers to apply while
dermining the optimum solution of a given legally required standby system application.

Panel Meeting Action: Reject

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

TCC Action: The Technical Correlating Committee directs that this
Comment be reported as “Reject” because less than two-thirds of the
members eligible to vote have voted in the affirmative as required in
4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Bruce W. Blouin, Power Analysis Associates Inc

Comment on Proposal No: 13-159

Recommendation: The Panel should continue to reject this Proposal.

Submitter: New York City has had a requirement for Selective
Coordination for decades. The NEC also has required selective coordination
for ground faults in health care facilities for decades. Requirements for
selectively coordinated overcurrent protective devices in elevator circuits have
existed in the NEC since the 1993 edition. Beginning with the 2005 NEC
requirements were added for selective coordination of emergency circuits
and legally required standby systems. We’ve found design solutions to meet
these requirements, with both circuit breakers and fused switches, without
compromising safety or reliability, and wondering what all the fuss is about.
We are a consulting engineering firm that specializes in short-circuit and
coordination studies, so we are intimately familiar with what it takes to
selectively coordinate both fuses and circuit breakers. It does take sharp
engineering skills to design both a selectively coordinated system and at the
same time to minimize arc-flash energies and equipment short-circuit damage,
but that is precisely what’s needed for critical circuits such as are found in
elevator, emergency systems, and legally required standby systems. But, it
can be and is achieved on a regular basis. Requiring total selectivity does
not tie our hands when it comes to multiple emergency generators. We can
design in transfer switches. We’ve heard of complaints about two devices in
series of the same size not coordinating. Simply making the downstream
disconnecting means a non-fused switch solves that problem. There is
no reason why we cannot design in transfer switches.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

TCC Action: The Technical Correlating Committee directs that this
Comment be reported as “Reject” because less than two-thirds of the
members eligible to vote have voted in the affirmative as required in
4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Merrell Young, Herzig Engineering

Comment on Proposal No: 13-159

Recommendation: Panel 13 needs to continue to Reject this and similar proposals
that remove the requirement for selective coordination of legally
required standby systems.

Substantiation: I would consider our consulting firm as experts on arc-flash,
short-circuit, and coordination studies. As such, we have been able to meet
the selectively coordinated requirements found in NFPA 70, 705, and 702, and
while at the same time, minimizing arc-flash hazards and improving reliability
and continuity of service. We are able to obtain selective coordination for both
overload and short-circuit conditions by utilizing various design techniques.
For example, we can specify zone selective interlocking with short-time delay
on the upstream circuit breaker so that upstream and downstream circuit
breakers will coordinate in both the overload zone and the short-circuit zone,
and provide for instantaneous reaction time for short circuits (including
around the breaker) between the circuit breakers, which keeps arc-flash hazards to
a minimum. Where our customers want fuses, we specify current-limiting fuses
that can both selectively coordinate and minimize arc-flash hazards. We are
able to design with transfer switches and various relaying schemes in order to
utilize multiple emergency generators, in parallel, for the greatest economy.
As far as ground faults are concerned, we sometimes add an additional layer
of ground fault protection in order to selectively coordinate under phase to
ground faults, utilizing the same approach as is already required for health

Final Action: Reject

Final Action: Reject

Final Action: Reject

Final Action: Reject

Final Action: Reject
care facilities. In short, we don't have to compromise to meet the selective coordination requirements, minimize personnel hazards, and protect equipment. It does take time and requires a thorough understanding of the entire electrical system, and that's what consulting engineers get paid to do.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.


ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-236 Log #1486 NEC-P13  Final Action: Reject

(701.18)

**TCC Action:** The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Submitter:** Christopher E. Buckner, Vanderbilt University Medical Center

**Comment on Proposal No:** 13-159

**Recommendation:** Disagree with panel action. Accept Proposal 13-159 as written.

**Substantiation:** Total selective coordination does not always result in the highest reliability and safety for an emergency system in all occupancy types; thus, selective coordination is a decision that should be made by the design engineer and not large and nationally respected hospital facility, I have a responsibility to balance the selective operation of our distribution system with the safety of our maintenance personnel and the safety of our equipment. Mandating selective coordination will subject our maintenance personnel to much higher Arc Flash potentials. Additionally, total selective coordination will lead to higher levels of equipment damage which will greatly increase downtime and jeopardize patient safety. In order to have total selective coordination, overcurrent devices will have to stay closed longer.

This increases arc flash and the same ampere rating does not decrease the safety of the system. This is just one of many considerations for optimizing the design of an emergency distribution system. The NFPA 110 requirement for “optimized selective tripping” is the design approach that has been used for years at our facility with NO incidents of fatalities, injuries, or excessive outages due to a lack of complete selective coordination. It is this code Panel’s responsibility to recognize and respect the fact that it is not practical for the code to address all occupancy types with a blanket mandate for total selective coordination since different occupancy types have different needs and priorities for their emergency systems. This is especially true of the healthcare occupancies where patient safety is priority one. Being forced to utilize fuses in lieu of circuit breakers will no doubt increase the duration of outages to an emergency system and will lead to unnecessary. This additional liability should not be forced on the design engineers or the facilities. Since total selective coordination does not ALWAYS result in the optimum system design, it should be removed as a code mandate. Let the design engineers do their jobs and not simply be dictated to by the code. Without this, we will lose our intelligence, which is the very thing that makes our profession a service to society. Jeopardizing patient safety is not for the greater good, and as a minimum, healthcare occupancies should be exempt from these requirements.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel action and statement on Comment 13-242.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 7 Negative: 6

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.


ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-237 Log #1499 NEC-P13  Final Action: Reject

(701.18)

**TCC Action:** The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Submitter:** James S. Nasby, Master Control Systems, Inc.

**Comment on Proposal No:** 13-161

**Recommendation:** Continue to REJECT this proposal.

**Substantiation:** This proposal should be rejected for the reasons given in my comments on Proposals on clause 700.27 which seek to eliminate or weaken the requirement. The same applies for the other such proposals on clause 701.18.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** The exception was added to provide relief for series coordination issues.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 11 Negative: 2

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My explanation of negative vote on Comment 13-223.

**Comment on Affirmative:**

STAFFORD, T.: The panel action was correct and this member agrees with the panel action. The exception(s) allow for the installation of a selectively coordinated system without conforming to the coordination requirements.

**Number Eligible to Vote:** 14

**Ballot Results:** Affirmative: 11 Negative: 2

**Ballot Not Returned:** 1 Gustafson, R.

**Explanation of Negative:**

RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

WOOD, T.: See My explanation of negative vote on Comment 13-223.

13-239 Log #1610 NEC-P13  Final Action: Accept in Principle

(701.18)

**TCC Action:** The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

**Submitter:** Marcelo Valdes, GE

**Comment on Proposal No:** 13-159

**Recommendation:** Delete 701.18. Reinstate FPN from the 2002 NEC.

**Substantiation:** Comment in support of proposals 13-159, Log #1946 NEC-P13. This comment is in support of the proposal comment to delete 701.18 as written in NEC2005. Reasons to support the proposal to delete 701.18:

1) Conflict with NFPA 110 recommendations and, consequently, conflict with IBC requirements, chapter 27.
2) Conflict with generally adopted electrical design guidelines such as IEEE Recommended practices commonly known as the “Color Books”. IEEE standard 242 “Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems” demonstrates the conflict with the OSHA regulations.

3) Maximum reliability for any system is not a matter of simply providing selective tripping. Maximum reliability must take into account minimizing the effect of overloading conditions based on the probability of the conditions considered, the immediate effect of the event and the time to remedy the condition and restore needed power to the loads affected by the abnormal event. An industry reference for evaluating the reliability, normally expressed as availability, of power distribution system is IEEE standard 493-1997, “Recommended Practice for Design of Reliable Industrial and Commercial Power Systems”. At the highest level, system reliability is dependant on load interruption frequency and expected duration of load interruption events. If selectivity is achieved by increasing the size of protective elements or slowing the protection these elements could otherwise provide equipment and conductor damage may be increased and hence the repair time, or down time caused will be increased. This can lower the reliability of system. Good design practice should take into account these factors. The code requirement as currently written does not allow a designer to make these decisions.

4) Complete selectivity is impossible in most systems when all faults are considered. Specifically low to high magnitude single or three phase faults and zero sequence faults (ground faults), regardless whether circuit breakers or fuses are used.

a. This is due, in part, to the well-supported requirement for ground fault protection in critical power distribution systems of substantial size. This point is further elaborated in attachment A.

b. Also due to the need for transformer primary and secondary protection as defined in the NEC and good engineering practice. The line side main and low side main are similar overcurrent devices that need to handle similar current. This may occur to make them selective without over-sizing one or under-sizing the other. Furthermore, whether one trips, the other trips, or both trip the impact on the system is exactly the same. Over-sizing the line side device to drive selectivity, however, can decrease the protection afforded to the transformer increasing damage and increasing arc flash energy in the case of an event.

1NFPA 110, Annex A.6.3.1. “It is important that the various overcurrent devices be coordinated, as far as practicable, to isolate faulted circuits and to protect against cascading operation on short circuit faults. In many systems, however, full coordination is not practicable without using equipment that could be prohibitively costly or undesirable for other aid be given to prevent overloading of equipment by limiting the possibilities of large current surges due to instantaneous reestablishment of connections to heavy loads.”

2General Duty Clause (GDC). It is Section 5(a)(1) of the Occupational Safety and Health Act. “Each employer shall finish to each of his (sic) employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees...”


c. Due to size ratios of circuits used in normal power distribution design. Improving selectivity will normally require devices to have specific size ratios between other devices of example normally require a ratio of 5 between devices of the same class and manufacturer, greater ratio if the fuses are different class and allowances are made for all fuses that may be installed in a switch. Circuit breakers may need greater ratios. This can make the design of system impractical, larger than necessary with consequent effect on cost, size and protection afforded.

d. Due to considerations for the different fault characteristics of utility versus generator sources. Different configurations of sources create different selectivity and design constraints. As an example, in a double-ended substation that may use closed transitions to maintain system continuity a system may have twice the short circuit rating for a few seconds of each year. How much consideration should be given towards maintaining selectivity during that time? How much cost and building space should be allocated towards these seconds of selectivity?

5) Complete selectivity has no impact on system reliability for some circuit configurations such as when to similarly sized overcurrent protective devices are connected in parallel. This is the situation with transformer protection on the primary and secondary side of a transformer. Whether fuses or circuit breakers both devices are the same size once the transformer ratio is considered, hence, both devices see the exact same fault current for three phase faults and both may trip in similar time non-selectively. This has the same effect on loads whether one OCPD clears, the other, or both.

6) Safety for electrical personnel and any other personnel near electrical equipment or conductors. The attempt to achieve selectivity for maximum theoretical value of the overcurrent devices to be instantaneously or slow for lower value faults which are much more probable and widely acknowledged as being more dangerous. References to this risk, known as “Arc Flash Hazard” are included in the NEC, NFPA 70E and IEEE 1584. Ignoring this risk is not a valid protection and IEEE 1584 is contrary to the requirements of OSHA. Hence forcing a user to choose selectivity in lieu of following recommendations set forth in widely accepted engineering practices puts the user in a position of either obeying the NEC or OSHA, he cannot do both. This is not a position the NEC should force any user or designer to be in. Attachment B further elaborates on this point and provides an example of this situation.

7) Designing a system that is completely selective, if possible at all, will often require devices to be larger than otherwise needed driving equipment cost, installation space and allotted building space. In many cases to achieve the overcurrent protection may be sacrificed to the low probability of a fault ever occurring that requires that level of selectivity. Bolted faults are widely acknowledged to be very rare, yet trying to accommodate them in selectivity considerations will drive up cost and size, essentially unnecessarily.

The submitted Attachments A and B are more detailed discussions of the elimination of the two of the points listed above. The difficulty caused by ground fault protection and one example of the impact of the selectivity requirement on a simple system with respect to arc flash protection. Many of the other points have been more fully described in the comments and supporting documentation provided to this panel regarding this issue.

1NFPA 70, Article 110.16, Flash Protection

2NFPA 70E, “Standard for Electrical Safety in the Workplace”

3IEEE 1584, “Guide for Arc Flash Hazard Calculations”

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 14

Ballot Results: Affirmative: 8 Negative: 5

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #429).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See: my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-240 Log #1698 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Elmer G. Paine, Westlake Reed Leskosky

Comment on Proposal No: 13-159

Recommendation: Disagree with the panel action. Accept Proposal 13-159 as written.

Substantiation: None.

Panel Meeting Action: Reject


Number Eligible to Vote: 14

Ballot Results: Affirmative: 7 Negative: 6

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #429).

NASBY, J.: See NEMA Explanation of Negative on 13-204.

RAPPAPORT, E.: See: my explanation of negative vote on Comment 13-177.

WHITTALL, H.: See my explanation of negative vote on Comment 13-178.


ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-241 Log #1993 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Ed Larsen, Square D Company

Comment on Proposal No: 13-159

Recommendation: Reconsider and accept Proposal 13-159 to delete NEC 701.18.

201.18 Coordination. Legally required standby system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices.

Substantiation: Based on the panel statement which references 13-135, the substantiation of this proposal was not recognized by the panel as there is no panel statement that refutes the submitter’s concerns or technical merit.

The panel statement states that selectivity increases the reliability of an emergency system with no technical response to the NEMA substantiation with references to IEEE standards examples that are in direct opposition to the panel’s statement. The panel did not address or comment on the conflicting NFPA documents where the technical committee for NFPA 110 Emergency and Standby Power Systems does not require all devices to be selective. The Panel did not comment on the additional restriction in NEC 701.18 that requires all devices to be selective as compared to the NFPA Article 100 that provides the engineer the necessary latitude to choose the appropriate overcurrent devices and system configuration. Requiring all overcurrent devices to be selective is an over design for the system, which is recognized by the IEEE examples presented in the substantiation. This results in an increase in cost of equipment conductors and raceways, leading to unnecessary equipment cost and size increases, higher available short circuit currents and increased arc flash hazard for the installation. A review of the numerous public proposals to delete and revise NEC 701.18 along with the comments.
from the voting members of CMP 13 are recognizing that selectivity is not an independent technical solution as it impacts reliability, personnel safety from arc-flash hazard increases, and the removal of isolation devices such as circuit breakers in the electrical system.

I have assisted in the selective coordination of a number of facilities across the country and all of the following points have entered into the discussion at some point. The points discussed below are independent of applying fuses or circuit breakers; as a matter of fact, the overcurrent devices in the switchboard and the generator are based on the manufacturer dependent 2:1 fuse ratios. Consider the diagram I have provided and the challenges with selective coordination.

1) The State of Washington has amended the Selectivity requirement in the NEC 701.18 must be deleted, leaving selectivity to the engineering community in order to ensure that the most reliable and safest system is installed. Many other technical performance issues are left to the engineering community such as:
   a) Voltage drop, where you have an NEC compliant installation that is selectively coordinated and the lights dim and drop out computer systems.
   b) Sizing motor overcurrent devices for selectivity, where the motors are unable to start but they are NEC compliant, permitting exhaust fans in the legally required standby system to be code compliant even if they are unable to start.
   c) Ground-fault protection, where none is required on the emergency system. This is due to increased hazardous arc flash and simply ignores the unnecessary increase in the size of equipment and materials that are unnecessary and is ignoring the amendments that are utilized in the industry to address some of these issues:
      1) The State of Washington has amended the Selectivity requirement in the 2005 NEC.
      2) The healthcare industry in the State of Florida recognizes the challenges of selective coordination and permits overcurrent devices to overlap where no additional isolation is gained in the system. The 2005 NEC fails to address this issue.
      3) The inspection community in plan review has recognized this challenge as we have engaged in numerous conversations between engineers and inspectors that are working together to optimize selectivity per NFPA 110. They are recognizing that the NEC is more restrictive than necessary and having to address designs through 90.4 by getting permission from the AHJ to permit appropriate latitude to comply with NFPA 110 even though they are not compliant with NEC 701.18. There is no safety or performance compromised and it is easy to recognize enhancements in performance and reliability with enhanced safety as a by-product of a reduction in the size of the overcurrent devices.

The panel should reconsider the action taken on this proposal and the numerous others looking for relief in this section to provide the safest and most reliable system to the facility they are designing. Delete NEC 701.18 and leave the performance issues to the engineer as is done with numerous other aspects of the electrical system.

3) The need for the flexibility to optimize the design of a system recognized in IEEE Standard 242-2001 (The Buff Book). Section 15.1 states, “It is important that the various overcurrent protective devices be selectively coordinated to optimize the design, safety and operating requirements in order to determine the optimum design for each specific facility.”

Selective coordination is a system design issue, not a Code issue. The wording of this section would suggest that NEC 701.18 would selectively coordinate, but this is not what the definition Article 100 implies. The definition deals with localization of an overcurrent and, in many cases, selective coordination for ALL overcurrent devices serves no useful localization purpose such as when: 1) Overcurrent devices are located on the primary and secondary sides of a low voltage transformer with no loads in between. 2) A feeder overcurrent device is connected in series with the main overcurrent device in a downstream panelboard with no loads in between. 3) An overcurrent device on a generator is in series with an overcurrent device in a switchboard with no loads in between. In these instances, requiring both devices to be selectively coordinated does not add to the reliability of the system, which is the stated objective of the CMP.

When overcurrent devices are located on the primary and secondary sides of a low voltage transformer, sized to meet the NEC transformer protection requirements, it is almost impossible to also meet the requirement for selective coordination of this section, regardless of the type of overcurrent protective device chosen.

In many instances, it may not be possible to meet the requirements for generator protection provided by an overcurrent device located on or near the generator and provide selective coordination with downstream overcurrent devices. Further, the generator protection functions provided within the engine-generator controller by the manufacturer might not be able to selectively coordinate with downstream overcurrent devices.

The paralleling of generators is often done to enhance system reliability, which is the stated objective of the CMP, however, in order to meet the requirement for selective coordination each generator overcurrent device and controller must selectively coordinate with all downstream overcurrent devices. This may not be possible if the generators are of unequal size.

The upgrade or expansion may require the replacement of existing upstream equipment so that it will selectively coordinate with the new downstream equipment it must feed. The State of Washington has recognized the significant economic burden this is placing on builders and has issued an emergency order exempting existing buildings from meeting the selective coordination requirements of the 2005 NEC.

Systems are normally designed for selective coordination in the overload region of the overcurrent device time-current curves. If this was not so, they would not operate under normal conditions, so what is really being called for in this requirement is overload and short circuit selective coordination. In order to achieve total short circuit selective coordination, the size of upstream overcurrent protective devices may need to be increased and/or time delay trip characteristics increased, thereby possibly increasing the arc flash hazard. In other words, by forcing selective coordination for an event that most likely will never occur, namely a bolted fault, the hazards involved in performing tasks which most likely will occur, namely system maintenance, may be increased.

This is another reason why system designers need the flexibility to optimize the design of a system which the current requirement does not allow.

Further, as stated in the original NEMA substantiation to delete this text in proposal 13-137, we wish to once again point out the following:

1. The need for the flexibility to optimize the design of a system is recognized in IEEE Standard 242-2001 (The Buff Book). Section 15.1 states, “It is important that the various overcurrent protective devices be selectively coordinated to optimize the design, safety and operating requirements in order to determine the optimum design for each specific facility.”

2. The need for the flexibility to optimize the design of a system is also recognized in NFPA 110-2005, Standard for Emergency and Standby Power Systems. Section 6.5.1 states, “The overcurrent protective devices in the EPSS shall be coordinated to optimize selective tripping of the circuit overcurrent protective devices when a short circuit occurs. A further explanation of this statement is given in Annex A section A.6.5.1, “It is important that the various overcurrent devices be coordinated, as far as practicable, to isolate faulted circuits and to protect against cascading operation on short circuit faults. In many systems, however, full coordination is not practicable without using equipment that could be prohibitively costly or undesirable for other reasons.”

3. The NEC text conflicts with Chapter 27 of the International Building Code that specifically requires compliance with NFPA 110 for emergency systems. This presents a conundrum for the system designer and the AHJ. Which code takes precedence, the IBC or the NEC?

In summary, NEMA strongly supports selective coordination as a valuable safety asset in the current range where overloads most often occur. However, NEMA does not support the mandate for Selective Coordination for ALL current ranges and ALL overcurrent devices because safety and reliability can both actually be diminished, thus the section should be deleted.
Panel Meeting Action: Reject
Panel Statement: The overriding theme of Articles 700 and 701 is to keep the power on throughout an emergency situation, for life safety. Selective coordination increases the reliability of the emergency system. Selective coordination is essential for the continuity of service required in emergency and legally required standby circuits.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177. WHITTALL, H.: See my explanation of negative vote on Comment 13-178. WOOD, T.: Proposal 13-159 should have been accepted. The substantiation provided by the submitter of Proposal 13-159 is well founded. Selective coordination is a design consideration. While selectivity may be desirable in some cases, it has not been shown that the lack of coordination has been responsible for the loss of life, injury to persons, or damage to property.

If the Code Making Panel believes that selectivity is sometimes a design consideration, it should be in the Code as a FPN and not as mandatory language that is likely not to be enforced. The use of mandatory language in the Code makes the installer contractually liable for its implementation when this should be a “design-engineering” responsibility.

In all cases, the Proponents and the Commenters advocating the removal of both 700.27 and 701.18 have provided well-documented substantiation for their removal.

ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-243 Log #2161 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects. Submitter: Hugh Pace, Brown and Caldwell Engineers

Recommendation:
I disagree with the Panel Action. Accept Proposal 13-159 as written.

Substantiation:
“Total” coordination requirement is a mistake.

Panel Meeting Action: Reject

Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-244 Log #2172 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects. Submitter: Hugh Pace, Brown and Caldwell Engineers

Recommendation:
I disagree with the Panel Action. Accept Proposal 13-159 as written.

Substantiation:
“Total” coordination requirement is a mistake.

Panel Meeting Action: Reject

Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-245 Log #2193 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects. Submitter: Peter R. Walsh, Peter R. Walsh, P.E. & Associates

Comment on Proposal No: 13-159
Recommendation:
The Panel should continue to Reject this Proposal.

Substantiation:
The NEC has required selective coordination for elevator circuits for years without major problems. The recent expansion of requirements makes good sense for the users of the buildings. Who wants to suffer from a blackout as a result of non-selective coordination? Engineers have software programs, like Easy Power Version 8.0 that can automate selective coordination.

With Zone Selective Coordination trips, almost anything can be coordinated. Arc flash can be adjusted by proper trips. The code making panel should require reliable power through selective coordination of legally required standby systems.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
ZGONENA, T.: While zone selective interlocking is one tool that can be used for selective coordination, but is not available on all overcurrent protective devices. The commenter also seems to imply that arc flash hazards can be mitigated by changing trip settings, which is not the case in many situations. Also, see comment on 13-175.

13-246 Log #2316 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects. Submitter: David Beach, Gresham, OR

Comment on Proposal No: 13-162
Recommendation:
The proposal should have been Accepted.

Substantiation:
This requirement was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases forgoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the arc flash hazard; is that truly in the interest of safety?

Panel Meeting Action: Reject

Number Eligible to Vote: 14
Ballot Results: Affirmative: 7 Negative: 6
Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:
ELKINS, D.: See my Explanation of Negative on Comment 13-224 (Log #492).
NASBY, J.: See NEMA Explanation of Negative on 13-204.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.

13-247 Log #2317 NEC-P13 Final Action: Reject (701.18)

TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects. Submitter: David Beach, Gresham, OR

Comment on Proposal No: 13-164
Recommendation:
The proposal should have been Accepted.

Substantiation:
This requirement was added in 2005 without technical substantiation and is a design issue, not a safety issue. The proposal was an attempt by a fuse manufacturer to mandate the use of fuses in applications where circuit breakers are more appropriate for most installations. I would always include selective coordination in things desired of an electrical system design, but in many cases forgoing selective coordination can make for an installation that more clearly meets the safety objectives of the code. In many cases the use of fuses in these systems will dramatically increase the arc flash hazard; is that truly in the interest of safety?
TCC Action: The Technical Correlating Committee directs that this Comment be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: James Harvey, University of Michigan Hospitals and Health Centers

Comment on Proposal No: 13-159

Recommendation: Disagree with the Panel Action. Accept related Proposal 13-159, (and 13-135) as written. These two proposals are to delete section 701.27 (now in 70-2005), from the 70-2008 edition.

Substantiation: Currently we are operating under NEC 70-2002, and will soon adopt 70-2005 - but with a deletion of the requirement for adhering to section 700-27.

The emergency power systems encountered at our larger facilities (and some of the smaller facilities) are very complex. The current code section and its application should be left to Professional Engineers to apply while determining the optimum solution of a given legally required standby system application.
TCC Action: The Technical Correlating Committee directs that this Comment be reported as “Reject” because less than two-thirds of the members eligible to vote have voted in the affirmative as required in 4.4.6.4 of the NFPA Regulations Governing Committee Projects.

Submitter: Elmer G. Paine, Westlake Reed Leskosky

Comment on Proposal No: 13-137

Recommendation: Disagree with panel action. Accept Proposal 13-137 as written.

Substantiation: None.

Panel Meeting Action: Reject


Number Eligible to Vote: 14

Ballot Results: Affirmative: 8 Negative: 5

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative:

NASBY, J.: See my explanation of negative vote on Comment 13-204.
RAPPAPORT, E.: See my explanation of negative vote on Comment 13-177.
WHITTALL, H.: See my explanation of negative vote on Comment 13-223.
ZGONENA, T.: See My Explanation of Negative on Comment 13-175.
ARTICLE 705 — INTERCONNECTED ELECTRIC POWER PRODUCTION SOURCES

13-258 Log #2120 NEC-P13 Final Action: Accept in Principle (702.11)

Submitter: Mark R. Hilbert, Wolfeboro, NH
Comment on Proposal No: 13-181
Recommendation: Accept the Proposal.
Substantiation: The new FPN was not intended to identify that the disconnecting means which is the subject of 702.11 must disconnect the “service.” The FPN is necessary to identify to users of the NEC that this disconnecting means must be rated as “suitable for use as service equipment.” As described in Article 100, conductors supplying a building or other structure from a generator are “feeder” conductors. Seeing that the generator is outdoors, the conductors are “outside feeder conductors” and, therefore, they are included in the scope of Article 225. Section 225.31 requires that a disconnecting means be provided to disconnect all conductors that supply or pass through a building or structure. Section 702.11 amends the requirements of 225.32 to locate the disconnecting means required by 225.31 at the building or structure served, however, it does not amend the requirements of 225.36 for it to be “suitable for use as service equipment.” This requirement is often overlooked and the proposed FPN would go a long way towards identifying that there is another requirement in 225.36 that must be considered.

Panel Meeting Action: Accept in Principle
Panel Statement: Accept panel action and statement on Comment 13-259.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.

13-259 Log #2122 NEC-P13 Final Action: Accept in Principle (702.11)

Panel Meeting Action: Accept in Principle
Panel Statement: Accept the proposal in principle and revise 702.11 to read: Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors serve or pass through the building or structure.
Substantiation: The new FPN was not intended to identify that the disconnecting means which is the subject of 702.11 must disconnect the “service.” This comment is being submitted as an alternative to adding a new FPN. The new text will identify to users of the NEC that this disconnecting means must be rated as “suitable for use as service equipment.” As described in Article 100, conductors supplying a building or other structure from a generator are “feeder” conductors. Seeing that the generator is outdoors, the conductors are “outside feeder conductors” and therefore, they are included in the scope of Article 225. 225.31 requires that a disconnecting means be provided to disconnect all conductors that supply or pass through a building or structure.
Substantiation: The new FPN was not intended to identify that the disconnecting means which is the subject of 702.11 must disconnect the “service.” This comment is being submitted as an alternative to adding a new FPN. The new text will identify to users of the NEC that this disconnecting means must be rated as “suitable for use as service equipment.” As described in Article 100, conductors supplying a building or other structure from a generator are “feeder” conductors. Seeing that the generator is outdoors, the conductors are “outside feeder conductors” and hence, they are included in the scope of Article 225. Section 225.31 requires that a disconnecting means be provided to disconnect all conductors that supply or pass through a building or structure. Section 702.11 amends the requirements of 225.32 to locate the disconnecting means required by 225.31 at the building or structure served however, it does not amend the requirements of 225.36 for it to be “suitable for use as service equipment.” This requirement is often overlooked and the proposed new text would go a long way towards identifying that there is another requirement in 225.36 that must be considered.

Panel Meeting Action: Accept in Principle
Panel Statement: Accept the proposal in principle and revise 702.11 to read: Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors serve or pass through the building or structure. The disconnecting means shall meet the requirements of 225.36.
Panel Statement: The added sentence clarifies that the disconnecting means must comply with 225.36.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 1
Ballot Not Returned: 1 Gustafson, R.
5. Item #5 is in reference to the comments made by Mr. Hornberger and interconnected power sources shall be in accordance with Article 690. Exception No.1: Installation of solar photovoltaic systems operated as legally required standby system. Solar Photovoltaic Systems. Article 690. Table 705.3 Other Articles. Exception No.7 is in reference to a comment made by Mr. Swayne about the phrase “a sufficient number of” in his positive ballot comment. Panel Meeting Action: Accept in Principle in Part

Revise Article 705 from Proposal 13-184 to read as follows:

ARTICLE 705 Interconnected Electric Power Production Sources

I. General

705.1 Scope. This article covers installation of one or more electric power production sources operating in parallel with a primary source(s) of electricity.

FPN: Examples of the types of primary sources include a utility supply or an on-site electric power source(s).

705.2 Definitions.

Hybrid System. A system comprised of multiple power sources. These power sources could include photovoltaic, wind, micro-hydro generators, engine-driven generators, and others, but do not include electrical power production and distribution network systems. Energy storage systems such as batteries, flywheels, or superconducting magnetic storage equipment do not constitute a power source for the purpose of this definition.

Utility-Interactive Inverter Output Circuit. The conductors between the utility interactive inverter and the service equipment or another electric power production source. such as a utility, for electrical production and distribution network.

Point of Common Coupling. The point at which the power production and distribution network and the customer interface occurs in an interactive system. Typically, this is the load side of the power network meter.

705.3 Other Articles. Interconnected electric power production sources shall comply with this article and also with the applicable requirements of the articles in Table 705.3.

Table 705.3 Other Articles

<table>
<thead>
<tr>
<th>Equipment/System</th>
<th>Article</th>
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<tbody>
<tr>
<td>Generators</td>
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<tr>
<td>Legally required standby system</td>
<td>701</td>
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<tr>
<td>Optional standby systems*</td>
<td>702</td>
</tr>
</tbody>
</table>

FPN: *Where distribution equipment including switchboards and panelboards is fed, simultaneously by a primary source(s) of electricity and one or more utility-interactive inverters, and where this distribution equipment is capable of supplying multiple branch circuits or feeders or both, the interconnecting provisions for the utility-interactive inverter(s) shall comply with (1) through (7).

(1) Dedicated Overcurrent and Disconnect. Each source interconnection shall be made at a dedicated circuit breaker or fusible disconnecting means.
(2) Bus or Conductor Rating. The sum of the ampere ratings of overcurrent devices in circuits supplying power to a busbar or conductor shall not exceed 120 percent of the rating of the busbar or conductor.
(3) Ground Fault Protection. The interconnection point shall be on the load side of all ground-fault protective equipment.
(4) Inverter Output Protection. Where distribution equipment including switchboards and panelboards is fed, simultaneously by a primary source(s) of electricity and one or more utility-interactive inverters, and where this distribution equipment is capable of supplying multiple branch circuits or feeders or both, the interconnecting provisions for the utility-interactive inverter(s) shall comply with (1) through (7).
(5) Suitable for Back Feed. Circuit breakers, if backfed, shall be suitable for such operation.
(6) Fastening. Listed plug-in type circuit breakers backed by utility-interactive inverters that are listed and identified as interactive shall be permitted to omit the additional fastener normally required by 408.36(F) for such applications.
(7) Inverter Output Connection. Unless the panelboard is rated not less than the sum of the ampere ratings of all overcurrent devices supplying it, a connector in a panelboard shall be positioned at the opposite (load) end from the input feeder location or main circuit location. The bus or conductor rating shall have been sized for the loads connected in accordance with Article 220. A permanent warning label shall be applied to the distribution equipment with the following or equivalent wording:

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS CURRENT DEVICE
705.14 Output Characteristics.
The output of a generator or other electric power production source operating in parallel with an electric supply system shall be compatible with the voltage, wave shape, and frequency of the system to which it is connected.

FPN: The term compatible does not necessarily mean matching the primary source wave shape.

705.16 Interrupting and Short-Circuit Current Rating.
Consideration shall be given to the contribution of fault currents from all interconnected power sources for the interrupting and short-circuit current ratings of equipment on interactive systems.

705.20 Disconnecting Means, Sources.
Means shall be provided to disconnect all ungrounded conductors of an electric power production source( s) from all other conductors.

705.21 Disconnecting Means, Equipment. Means shall be provided to disconnect power production equipment, such as utility interactive inverters or transformers associated with a power production source, from all ungrounded conductors of all sources of supply. Equipment intended to be operated and maintained as an integral part of a power production source exceeding 1000 volts shall not be required to have a disconnecting means.

705.22 Disconnect Device. The disconnecting means for ungrounded conductors shall consist of a manually or power operable switch(es) or circuit breaker(s) with the following features:
(1) Located where readily accessible
(2) Externally operable without exposing the operator to live parts and if power operable, of a type that could be opened by hand in the event of a power supply failure
(3) Plainly indicating whether in the open (or closed (on) position
(4) Having ratings not less than the load to be cared and the fault current to be interrupted

For disconnect equipment energized from both sides, a marking shall be provided to indicate that all contacts of the disconnect equipment might be energized.

FPN No. 1: In parallel generation systems, some equipment, including knife blade switches and fuses, is likely to be energized from both directions. See 240.40.

FPN No. 2: Interconnection to an off-premises primary source could require a visibly verifiable disconnecting device.

(5) Simultaneous disconnect of all ungrounded conductors of the circuit.
(6) Capable of being locked in the open (off) position.

705.30 Overcurrent Protection. Conductors shall be protected in accordance with Article 240. Equipment and conductors connected to more than one electrical source shall have a sufficient number of overcurrent devices located so as to provide protection from all sources.

(A) Solar Photovoltaic Systems. Solar photovoltaic systems shall be protected in accordance with Article 690.

(B) Transformers. Overcurrent protection for a transformer with a source(s) on each side shall be provided in accordance with 450.3 by considering first one side of the transformer, then the other side of the transformer, as the primary.

(C) Fuel Cell Systems. Fuel cell systems shall be protected in accordance with Article 692.

(D) Utility Interactive Inverters. Utility interactive inverters shall be protected in accordance with 705.65.

(E) Generators. Generators shall be protected in accordance with 705.130.

705.32 Ground-Fault Protection. Where ground-fault protection is used, the output of an interactive system shall be connected to the supply side of the ground-fault protection.

Exception: Connection shall be permitted to be made to the load side of ground-fault protection, provided that there is ground-fault protection for equipment from all ground-fault current sources.

705.40 Loss of Primary Source. Upon loss of primary source, an electric power production source shall be automatically disconnected from all ungrounded conductors of the primary source and shall not be reconnected until the primary source is restored.

Exception: A listed Utility Interactive Inverter shall be permitted to automatically cease exporting power upon loss of primary source and shall not be required to automatically disconnect all ungrounded conductors from the primary source. A listed Utility Interactive Inverter shall be permitted to automatically or manually resume exporting power to the utility once the primary source is restored.

FPN No. 1: Risks to personnel and equipment associated with the primary source could occur if an utility interactive electric power production source can operate as an intentional island. Special detection methods are required to determine that a primary source supply system outage has occurred and whether there should be automatic disconnection. When the primary source supply system is restored special detection methods can be required to limit exposure of power production sources to out-of-phase reconnection.

FPN No. 2: Induction-generating equipment on systems with significant capacitance can become self-excited upon loss of primary source and experience severe overvoltage as a result.

A utility interactive inverter shall be permitted to operate as a stand-alone system to supply loads that have been disconnected from electrical production and distribution network sources.

705.42 Loss of Three-Phase Primary Source. A 3-phase electric power production source shall be automatically disconnected from all ungrounded conductors of the interconnected systems when one of the phases of that source opens. This requirement shall not be applicable to an electric power production source providing power for an emergency or legally required standby system.

Exception: A listed utility interactive inverter shall be permitted to automatically cease exporting power when one of the phases of the source opens and shall not be required to automatically disconnect all ungrounded conductors from the primary source. A listed utility interactive inverter shall be permitted to automatically or manually resume exporting power to the utility once all phases of the source is restored.

705.50 Grounding. Interconnected electric power production sources shall be grounded in accordance with Article 250.

Exception: For direct-current systems connected through an inverter directly to a grounded service, other methods that accomplish equivalent system protection and that utilize equipment listed and identified for the use shall be permitted.

II. Utility Interactive Inverters

705.60 Circuit Sizing and Current.
(A) Calculation of Maximum Circuit Current. The maximum current for the specific circuit shall be calculated in accordance with 705.60(A)(1) through (A)(C).

(1) Inverter Source Circuit Currents. The maximum current shall be maximum rated input current of the inverter.

(2) Inverter Output Circuit Current. The maximum current shall be the inverter continuous output current rating.

(B) Ampacity and Overcurrent Device Ratings. Inverter system currents shall be considered to be continuous.

(1) Sizing of Conductors and Overcurrent Devices. The circuit conductors and overcurrent devices shall be sized to carry not less than 125 percent of the maximum currents as calculated in 705.60(A). The rating or setting of overcurrent devices shall be permitted in accordance with 240.4(B) and (C).

Exception: Circuits containing an assembly together with its overcurrent device(s) that is listed for continuous operation at 100 percent of its rating shall be permitted to be utilized at 100 percent of its rating.

705.65 Overcurrent Protection.
(A) Circuits and Equipment. Inverter input source circuits, inverter output circuit and storage battery circuit conductors and equipment shall be protected in accordance with the requirements of Article 240. Circuits connected to more than one electrical source shall have overcurrent devices located so as to provide overcurrent protection from all sources.

Exception: An overcurrent device shall not be required for circuit conductors sized in accordance with 705.60(B) and located where one of the following apply:

(a) There are no external sources such as parallel-connected source circuits, batteries, or backfeed from inverters.
(b) The short-circuit currents from all sources do not exceed the ampacity of the conductors.

FPN: Possible backfeed of current from any source of supply, including a supply through an inverter into the inverter output circuit and inverter source circuits, is a consideration in determining whether adequate overcurrent protection from all sources is provided for conductors and modules.

(B) Power Transformers. Overcurrent protection for a transformer with a source(s) on each side shall be provided in accordance with 450.3 by considering first one side of the transformer, then the other side of the transformer, as the primary.

Exception: A power transformer with a current rating on the side connected toward the inverter power source not less than the short-circuit output current rating of the inverter shall be permitted without overcurrent protection from that source.

(C) Inverter Source Circuits. Branch-circuit or supplementary-type overcurrent
devices shall be permitted to provide overcurrent protection in inverter source circuits. The overcurrent devices shall be accessible but shall not be required to be readily accessible. Standard values of supplementary overcurrent devices allowed by this section shall be in one ampere size increments. starting at one ampere up to and including 15 amperes. Higher standard values above 15 amperes for supplementary overcurrent devices shall be based on the standard sizes provided in 240.6(A).

(D) Direct-Current Rating. Overcurrent devices. either fuses or circuit breakers. used in any dc portion of a utility interactive inverter power system shall be listed for use in dc circuits and shall have the appropriate voltage. current. and interrupt ratings.

(E) Series Overcurrent Protection. In series-connected strings of two or more modules. a single overcurrent protection device shall be permitted.

705.70 Utility-Interactive Inverters Mounted in Not-Readily-Accessible Locations. Utility-interactive inverters shall be permitted to be mounted on roofs or other exterior areas that are not readily accessible. These installations shall comply with (1) through (4):

(1) A direct-current disconnecting means shall be mounted within sight of, or in the inverter.

(2) An alternating-current disconnecting means shall be mounted within sight of, or in the inverter.

(3) An additional alternating-current disconnecting means for the inverter shall comply with 705.22.

(4) A plaque shall be installed in accordance with 705.10.

705.80 Utility Interactive Power Systems Employing Energy Storage. Utility Interactive power systems employing energy storage shall also be marked with the maximum operating voltage including any equalization voltage and the polarity of the grounded circuit conductor.

705.82 Hybrid Systems. Hybrid Systems shall be permitted to be interconnected at the point of common coupling with utility-interactive inverters.

705.95 Ampacity of Neutral Conductor. If a single-phase 2-wire inverter output is connected to the neutral and one ungrounded conductor (only) of a 3-wire system or of a 3-phase 4-wire wye-connected system, the maximum load connected between the neutral and anyone ungrounded conductor plus the inverter output rating shall not exceed the ampacity of the neutral conductor.

705.100 Unbalanced Interconnections.

(A) Single Phase. Single-phase inverters for hybrid systems and ac modules in interactive hybrid systems shall not be connected to 3-phase power systems unless the interconnected system is designed so that significant unbalanced voltages cannot result.

(B) Three Phase. Three-phase inverters and 3-phase ac modules in interactive systems shall have all phases automatically de-energized upon loss of. or unbalanced, voltage in one or more phases unless the interconnected system is designed so that significant unbalanced voltages will not result.

III. Generators

705.130 Overcurrent Protection. Conductors shall be protected in accordance with Article 240. Equipment and conductors connected to more than one electrical source shall have overcurrent devices located so as to provide protection from all sources. Generators shall be protected in accordance with 445.12.

705.143 Synchronous Generators. Synchronous generators in a parallel system shall be provided with the necessary equipment to establish and maintain a synchronous condition.

Panel Statement: This revision incorporates cComments 3-262. 13-263. 13-265. 13-266. and 13-267.

• Typographical error - “Point of Common Coupling” definition was removed from the Utility Interactive Inverter Output Circuit definition.

• Listed Solar Photovoltaic Systems and Fuel Cell Systems in Table 705.3 and removed Exceptions (1) and (2) for these systems, respectively.

• Deleted second sentence in 705.4, requiring interconnected system equipment to be listed.

• Revised 705.12 to reflect Hornberger Ballot Comment on proposal 13-184.

• Added requirement for a lockable disconnect in 705.22

• Added overcurrent protection reference for utility interactive inverters to 705.30.

• Added overcurrent protection reference for generators to 705.30.

• Deleted the word “normally” in the last sentence of 705.40.

• Deleted the phrase “the alternating-current output conductors from the inverter and” from 705.70(3).

• Deleted the phrase “a sufficient number of” in the second sentence of the text for 705.70.30.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 14 Negative: 1

Ballot Not Returned: 1 Gustafson, R.

Explanation of Negative: HORNBERGER, B.: I agree with the panel action, however, the panel discussed recommending that a Task Group be formed to review the redundant “Point of Connection” requirements for PV in 690, Fuel Cells in 692 and Interconnected Electric Power Sources in 705. There is no mention of this in the panel statements. The panel harmonized most of these requirements through their actions on Comments 13-77, 13-97 and 13-262. Photovoltaic and Fuel Cell systems are “Interconnected Electric Power Sources”, when they operate in parallel with another supply source. Article 705 should apply. Point of connection requirements in Articles 690 and 692 should only contain “special” considerations that pertain to the specific power source technologies.

Comment on Affirmative: BOWER, W.: These comments are primarily editorial in nature.

Under 705.2 Definitions, the term “utility interactive” should be hyphenated and the periods after source and utility should be changed to commas.

Under Table 705.3, the Other Articles should be listed with consistency by capitalizing each term in the titles.

Under 705.4, the term “Utility-Interactive Inverters” should be “Utility-interactive inverters” and I do not understand the identified for interconnection service. This should be changed to reflect UL marking requirements.

Under 705.12, the 692.65 should be deleted as it was likely a carryover from cut and paste editing.

Under 705.12(C) the term “KW” should be “kW”. Additionally, the 100kW requirement that is already in 705 seems over restrictive by requiring qualified persons to operate every system above 100kW. This limit should be considered by a task group for future editions.

Under 705.12(D) the term “Utility Interactive” in the title should be “Utility-interactive”.

Under 705.12(D)(3) the term “Ground Fault” should be “Ground-fault” and the exception should be italics.

Under 705.21, the term “utility interactive” should be hyphenated. Under 705.22(4), the term “cased” should be changed to “carried”. Also, I believe the numbering 1-4 should be lettered A-D.

Under 705.30(D) the term “utility interactive inverter” should be “Utility-interactive inverters” in both instances.

Under 705.40 Exception and FPNs, correct the terms to “utility-interactive inverter”.

Under 705.60(B), the word “system” should be deleted and “currents” changed to “current” since inverter current is sufficient. Inverter system is undefined in the code.

Under 705.65, change the periods after supply, circuits, transformer and transformer to commas.

Under 705.65(C) change the periods after increments and breakers to commas and change the term “starting” to “starting”.

Under 705.65(D) change the period after breakers to a comma.

Under 705.65(E), the language does not make sense. It is unclear what is meant by two or more modules for this generic section. It is suggested that 705.65(E) be deleted since it does not make sense and appears to be not applicable to inverters.

Under 705.70, I believe the list should be labeled A through D and not 1 through 4. Also the reference in (3) should be to both 705.21 and 705.22. Under 705.80 the term utility-interactive should be “Utility-interactive” in both instances.

Under 705.82, the second “Hybrid Systems” should be “Hybrid systems”. Under 705.100, the terms “and ac modules” and “and 3-phase ac modules” should be deleted. AC modules are covered under Article 690. Also the periods after “and” and “unbalanced” should be changed to commas.

Under the “Panel Statement”, the exceptions (1) and (2) (as stated) were not removed. However, they should not have been removed since they still apply. The listing of Solar Photovoltaic Systems and Fuel Cells in the table should remain in the table.

GENERAL COMMENT ABOUT ARTICLE 705. THIS ARTICLE IS FULL OF WHOLESALE REFERENCES TO COMPLETE ARTICLES WITHIN THE CODE. IT IS RECOMMENDED THAT A TASK GROUP REVIEW AND REWRITE THE ENTIRE ARTICLE TO COMPLY WITH THE STYLE MANUAL AND TO INCLUDE COMPLETE INDUSTRY INPUTS.

KRATINS, K.: The folks who write the UL marking requirements should be considered prior to incorporation of the proposal as currently worded in the ballot.

(a) For better clarity, revise the last sentence of 705.4 to read: “Utility-interactive inverters connected in parallel with a primary source of electricity shall be listed as suitable for such applications.”

(b) Add the definite article “the” after the word “be” in 705.60(A)(1).

(c) Change “output circuit” to “output circuits” in the first sentence of 705.65(A).

(d) In 705.65, change “anyone” to either “any,” “any one,” or “any single.”

INTERPRETATION REFFERS TO A PERSON; NOT A CONDUCTOR.

STAFFORD, T.: The Panel action was correct and this member agrees with the panel action. The increasing use of alternative power sources, other than utility supplied, increases the complexity and the safety requirements for interconnected electric power systems. By including Article 690, Solar Photovoltaic Systems, and Article 692, Fuel Cell Systems, in Article 705, there is a commonality among all power sources and their interconnection requirements with the utility distribution system.
ZGONENKA, T.: This affirmative vote will allow us to benefit from the substantial work performed on this proposal. Unfortunately, this large proposal that incorporates many significant issues, was modified by the CMP 13 705 Task Group and is now addressed as a single proposal. The present proposal is not implemented in a manner that addresses all utility interconnected product types equally. One of the revision made to 705.4, deleted the requirement for all interconnection system equipment to be listed. Engine Generators like other utility interactive devices should be evaluated and Listed for utility interconnection, especially since engine generators have significantly more fault current than other DG sources. To vote against this proposal would jeopardize the significant amount of this valuable work. The requirement for Listed Equipment will need to be addressed in the 2011 code.

13-263 Log #1187 NEC-P13 Final Action: Accept in Principle (705)


Comment on Proposal No: 13-184

Recommendation: The Panel action rewrite of the original proposal should be revised to incorporate Mr. Hornerberg’s ballot comment, revising the proposed sections 705.12 and 705.22. The text from Mr. Hornerberg’s ballot comment is repeated here for convenience with edits underlined:

**705.12 Point of Connection.** The output of an interconnected electric power source shall be connected as specified in 692.65(A), (B), (C), or (D).

(A) Supply Side. Any interconnected electric power source shall be permitted to be connected to the premises service disconnecting means, beyond the point of common coupling.

(B) Integrated Electric Systems. The outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where the system qualifies as an integrated electric system and incorporates protective equipment in accordance with all applicable sections of Article 685.

(C) Greater Than 100 KW. The outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met:

1. The aggregate of non-utility sources of electric capacity shall be less than 120 percent of the busbar or conductor rating in accordance with all applicable sections of Article 685.
2. The conditions of maintenance and supervision ensure that qualified persons service and operate the system.

(D) Utility Interactive Inverters rated less than 100 KW. The output of a utility interactive inverter power source with a capacity of less than or equal to 100 KW shall be permitted to be connected as specified in either 705.12(D)(1) or 705.12(D)(2) or 705.12(D)(3).

1. Load Side. A utility-interactive inverter shall be permitted to be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises, provided that all of the conditions of 705.12(D)(1)(a) through 705.12(D)(1)(e) are met:
   a) The disconnect and disconnect devices shall be made at a dedicated circuit breaker or fusible disconnecting means.
   b) Ground Fault Protection. The interconnection point shall be on the line side of all ground-fault protection equipment.
   c) Marking. Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor shall be marked to indicate the presence of all sources.
   d) Suitable for Back Feed. Equipment such as circuit breakers, if backfed, shall be identified for such operation.
   e) Bus or Conductor Rating. The rating of the bus or conductor to which the utility-interactive inverter breaker or fusible disconnect is connected shall meet all of the conditions of 705.12(D)(1)(a)(1) or 705.12(D)(1)(a)(2).

2. End Feed Connection. Where the utility-interactive inverter breaker or fusible disconnect is connected in the distribution equipment at the opposite (load) end from the input feeder connection or main circuit location, the bus or conductor rating shall be equal to or larger than the sum of the ampere ratings of all overcurrent devices connecting premise electric power production sources to the bus or conductor. The bus or conductor rating shall have been sized for the loads connected, in accordance with Article 220. A permanent warning label shall be applied to the distribution equipment with the following or equivalent:

**WARNING**

**ELECTRIC POWER PRODUCTION SOURCE OUTPUT**

**DO NOT RELOCATE THIS OVERCURRENT DEVICE.**

3. General Connection. Where the utility-interactive inverter breaker or fusible disconnect is not end fed, the bus or conductor rating shall be equal to or larger than the sum of the ampere ratings of overcurrent devices in circuits supplying power to the busbar or conductor.

**Exception:** For a dwelling unit, the sum of the ampere ratings of the overcurrent devices shall not exceed 120 percent of the rating of the busbar or conductor.

Substantiation: The disconnecting means for ungrounded conductors shall consist of a manually or power operable switch or circuit breaker with the following features:

1. Located where readily accessible
2. Externally operable without exposing the operator to contact with live parts and if power operable, of a type that can be opened by hand in the event of a power supply failure.
3. Plainly indicating whether in the open (on) or closed (off) position
4. Having ratings not less than the load to be carried and the fault current to be interrupted
5. Lockable in the open position.

**Substantiation:** 705.12 should be reworded as to incorporate changes accepted in Proposals 13-61 for 690.64(B)(1) and 13-74 for 692.65(B)(2), and generalized for Utility Interactive Inverters. Also, revise 705.22, as shown, to restate the requirement for a “Lockable Disconnect” for the AC output circuits. This disconnect is essential to provide positive and visible confirmation that an interconnected power source has no possible method to backfeed electrical energy into a system which has been de-energized for maintenance or to meet the needs of emergency first response personnel. This requirement is necessary so qualified personnel can lockout the source of electrical current as required in many OSHA and NFPA 70E regulations.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 13-262.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15

Ballot Not Returned: 1 Gustafson, R.

13-264 Log #2199 NEC-P13 Final Action: Reject (705)


Comment on Proposal No: 13-184

Recommendation: Reject the proposed change.

Substantiation: The panel acknowledged the value of such a proposal and accepted this proposal in principle to permit public comment of the proposal. Comments have been received and will be reviewed further at the CMP-13 ROC meeting in November. But, feedback to this point indicates that to adequately address the concerns of a change of this magnitude and craft language that will neither omit nor introduce wording that will compromise safety for the affected industries that a working group will need to convene to provide a comprehensive proposal for the 2011 NEC. The proposal should not be rejected by the panel to ensure that the changes indicated in the 2008 NEC ROP are not inadvertently included in the final publication.

Panel Meeting Action: Reject

Panel Statement: This change to Article 705 would have permitted application of utility-interactive inverter interconnections for technologies other than solar photovoltaic and fuel cells, e.g., wind, micro-hydro, combined heat and power, micro-turbines, etc. This change has had public review with few comments that have been addressed by the panel action on Comment 13-262.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15

Ballot Not Returned: 1 Gustafson, R.

13-265 Log #2299 NEC-P13 Final Action: Accept in Principle (705)

Submitter: Todd Stafford, IBEW-NJATC / Rep. IBEW

Comment on Proposal No: 13-184

Recommendation: Revise wording to include the changes, if any, that are made to sections 690.64(B)(2), and 692.65(B)(2), and 705.22 as recommended by Hornerberg.

Substantiation: While I agree with the panel action, the comment submitted by Hornerberg needs to be addressed. The TCC recommends that additional consideration be given to the comments submitted as well.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 13-262. The Panel Action on 13-184 should continue to be “Accept in Principle in Part” but the Panel should reconsider and reject the entire proposal of Proposal 13-184.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15

Ballot Not Returned: 1 Gustafson, R.

13-266 Log #2337 NEC-P13 Final Action: Accept in Principle (705.4)

Submitter: Alan Manche, Square D Company

Comment on Proposal No: 13-185

Recommendation: The Panel Action on 13-184 should continue to be “Accept in Principal in Part” but the Panel should reconsider and reject the entire proposal of Proposal 13-184.

Substantiation: A requirement for the system to be listed for this particular application has not been justified. And, listing of an electrical system of this
nature is not practical unless the CEM intends to exclude most of the kinds of systems that are installed and operated safely today. 705.4, as it reads in the ROP, would require the system (electrical equipment, alternate power source and controls, raceway, size, etc.) to all be a documented assembly.

As accepted at the ROP stage, 705.4 will require listing of “interconnection systems.” This term is not defined in the NEC, and where it is defined in standards, it is a broad term that the ability to obtain listings for all such systems will be questionable. 705.4 also calls for identification for “interconnection service.” This is an undefined term, and there are no standards requiring such identification.

Mr. Daley’s proposed text and substantiation, in an attempt to build support for product listing, lends support to just the contrary. His substantiation “it is necessary to expand the description of what is acceptable because many interconnection systems are site specific and would be comprised of recognized components suitable for the intended use” indicates the need to use various manufacturer’s equipment and various components to make the system work safely and reliably. Note his substantiation that these are very “site specific” and are each unique in construction and assembly.

The panel states that “a compilation of components would not necessarily meet the requirements for interconnection systems unless tested as a complete system. In addition, the submitters gave no technical substantiation for this part of the proposal.” So if the equipment is required to be listed and Mr. Daley is explaining that it takes various components to make the system work, how does the panel believe the system can now be installed, work appropriately and comply with the NEC?

Paralleling switchgear will often include various manufacturer’s sections, which are interconnected on the job, and that are not assembled in a factory location. UL can neither test the product as assembled. Mr. Daley acknowledges the need to have provisions for field installed components that will modify the equipment in the field. As an example, consider the fact that the electrical gear will be supplied without knowing what manufacturer generator is going to be used. Generator protection systems will be interconnected in the field and the generator that are not tied to the listing of the gear. The UL Listed assembly will now have been modified.

Now let’s review the UL White Book — “What happens to the Listing if a UL-Listed product is modified in the field?” An authorized use of the UL Mark is the manufacturer’s declaration that the product was originally manufactured in accordance with the applicable requirements when it was shipped from the factory. When a UL-Listed product is modified after it leaves the factory, UL has no way to determine if the product continues to comply with the safety requirements used to certify the product without investigating the modified product. UL can neither indicate that such modifications “void” the UL Mark, nor that the product continues to meet UL’s safety requirements, unless the field modifications have been specifically investigated by UL. It is the responsibility of the Authority Having Jurisdiction (AHJ) to determine the acceptability of the modification.

In effect the UL mark does not support modifications, such as the above, in the field unless it is field evaluated. The UL mark is a valuable mark to ensure equipment meets specific safety standards, however, in this case what benefit is the listing if the equipment is going to be modified and the third party will not (can not be expected to) stand behind that mark after the system is installed?

Understanding the safe operation of the system is a field installation issue not the CMP-13 action text, and not in respect to the 2005 NEC):

705.12 Point of Connection. The outputs of electric power production systems connected to a distribution system shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met:

(a) The aggregate of non-utility sources of electricity has a capacity in excess of 100 kW Location: the outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met:

(b) Greater than 100 kW: The outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met: the aggregate of non-utility sources of electricity has a capacity in excess of 100 kW Location: the outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met:

(c) 0-100 kW: The outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met:

(d) Less than or equal to 100 kW: The outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met: the aggregate of non-utility sources of electricity has a capacity in excess of 100 kW Location: the outputs shall be permitted to be interconnected at a point or points elsewhere on the premises where all of the following conditions are met:

70-476
WARNING

ELECTRIC POWER PRODUCTION SOURCE OUTPUT

DO NOT RELOCATE THIS OVERCURRENT DEVICE

Substantiation: Although the Technical Correlating Committee requested CMP-9 comment on Proposal 13-61, and the panel has done so, the technical issues raised in that and in the associated proposals apply to all systems capable of interfacing and parallel operation using multiple sources or receiving current supply from two sources can be arranged so the busbars will not exceed their ampacity (the "opposite end" scenario accepted under Proposal 13-6), however CMP-9 points out that such an arrangement allows for up to double the amount of load to be taken from the panel for the indefinite periods of time. Current product standards do not anticipate the effect of 12IR heating losses under these conditions, which could severely impact the performance of essential components within the distribution equipment. Before the NEC recognizes this type of connection, it is essential that careful testing be carried out to determine the acceptable parameters that should be applied in these cases.

For example, if a windmill provides 100 amperes of power to a panel in an interconnected system rated 100 amperes, and this panel is supplied by a normal utility supply of 100 amperes the branch circuit and feeder loads supplied by this panel could total 200 amperes. Although such a load should not exist due to required sizing rules relative to Article 220 calculations, the requirement for independent protection for panelboards (not applicable to all panelboards by virtue of CMP-9 action in this cycle) anticipates that these load calculations are easily circumvented given the relative ease of circuit modifications.

Although the panel action on this proposal did not include the double-ended wording that one normally associates an arrangement of this type and others and continues to lurk in the panel action text. This is because the current (and proposed) 705.12(B) allows this (in fact, there isn’t even an opposite end requirement in this provision) for larger systems. CMP-9 offers this comment to address this issue as well as a number of style Manual issues within this section as well. This comment does not apply to any wording in Article 705 other than that in 705.12. A detailed analysis follows.

This comment creates a separate subsection to address the double-feed issue, because this is an over-100 kW system. In fact, it may be even more compelling on the larger systems. One member of CMP-9 personally wired a 120 kW cogeneration system interconnection into a remote lighting and appliance branch circuit panelboard for no reason other than it was the closest convenient connection point, and the NEC allowed it to happen. These applications are generally more likely to create the conditions for concern expressed in this comment than the relatively limited energy available from typical PV connections.

Therefore, this comment removes the PV language from the panel action text. In addition, CMP-9 points out that since the content of (C) accepted by CMP-13 only addresses PV interconnections, the entirety of (C) as drafted by CMP-13 is beyond the article’s reach because 705.3 Exception No. 1 cedes control of the system to Article 690. This can, however, sources generally controlled by Article 705. It also removes the language on PV inverters and the associated circuit breaker rules because this language will only confine itself to PV systems that modified per 705.3, Exception No. 1. Note also that Article 692 will have comparable rules, enforceable here through 705.3, Exception No. 2, but which are not addressed in the panel action text on this proposal.

This comment avoids these pitfalls. This comment also builds the exception for single source connections into the parent rule, using positive language and thereby ensuring that an overloaded busbar does not exacerbate the heating problem. This comment has been balloted through CMP-9 with the following balloting results.

11 Eligible to Vote
10 Affirmative
1 Not Returned (H. deVega)

Panel Meeting Action: Accept in Part
The panel accepts in part as follows:
• Accept the recommendations for the supply side connection point.
• Incorporate the breaker clamping requirement and the 120% source capacity limit for any connection to be taken from panel for the indefinite periods of time.

Ballot Results: Affirmative: 15

Ballet Not Returned: 1 Gustafson, R.

ARTICLE 720  —  CIRCUITS AND EQUIPMENT OPERATING AT LESS THAN 50 VOLS

3-91 Log #1205 NEC-P03 Final Action: Accept (720.10)

Submitter: Neil F. Labrake, Jr., Syracuse, NY

Comment on Proposal No: 3-91

Recommendation: The NEC Grounding and Bonding Task Group concurs with CMP-3 action on 720.10 since Proposal 3-136 will delete this section.

Substantiation: This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiener; Dalep Mehla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. Labrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 13

ARTICLE 725  —  CLASS 1, CLASS 2, AND CLASS 3 REMOTE-CONTROL, SIGNALING, AND POWER-LIMITED CIRCUITS

3-92 Log #758 NEC-P03 Final Action: Accept in Principle (725.2)

"TCC Action: The Technical Correlating Committee directs that the panel action be revised in a Fine Print Note to read as follows: FPN: See 725.21 for voltage and power limitations of Class 1 circuits.” This change is made to comply with 4.1.2 of the NEC Style Manual.

Submitter: David B. Wechsler, The Dow Chemical Company

Comment on Proposal No: 3-142

Recommendation: Revise as follows:
Class 1 Circuit. The portion of the wiring system between the load side of the overcurrent device or power-limited supply and the connected equipment. The voltage and power limitations of the source are in accordance with 725.21.

Substantiation: 725.2 is a definition section for Article 725. The text shown as needing to be deleted represents a requirement. NFPA Style Manual prohibits a section. This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiener; Dalep Mehla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. Labrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-93 Log #1807 NEC-P03 Final Action: Reject (725.2, 725.11, 725.15, 725.21, and 725.22)

Submitter: Michael Walls, American Chemistry Council

Comment on Proposal No: 3-142

Recommendation: Accept this proposal.

Substantiation: The submitter’s intent was to delete remote control and signaling from Article 725, rather than better align with similar concepts in other articles so the applications can be still utilized under the appropriate design application. These applications, uses more general terms that still meet the current intent.

Panel Meeting Action: Reject

Revise the second sentence of the existing definition as follows:
The voltage and power limitations of Class 1 circuits are located in 725.21.

Panel Meeting Action: Accept in Principle

The second sentence of the existing definition as follows:
The voltage and power limitations of Class 1 circuits are located in 725.21.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13
**Section 300.21**

**Spread of Fire or Products of Combustion**

**Panel Statement:** Maintain parallelism with Articles 770, 800, 820 and 830.

**Substantiation:** Removing abandoned cables from buildings.

**Comment on Proposal No:** 3-97 Log #1604 NEC-P03

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Recommendation:** Continue to reject these proposals.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Proposal:** Moving 300.11 (Securing and Supporting) requires that “Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place.” It is not possible to remove all abandoned cables if the installation complies with 300.11 and the cables are installed behind a wall.

**The Society of the Plastics Industry recommends rejection all proposals that recommend the removal of all abandoned cables rather than the accessible portion of abandoned cables.**

**Panel Meeting Action:** Accept

**Ballot Results:** Affirmative: 13

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**Section 725.3(B) and 760.2(B)**

**Panel Statement:** Maintain parallelism with Articles 770, 800, 820 and 830.

**Substantiation:** Removing abandoned cables from buildings.

**Comment on Proposal No:** 3-94 Log #1603 NEC-P03

**Submitter:** John Burke, Fusion Cable Systems

**Recommendation:** Continue to reject this Proposal.

**Substantiation:** We remove old and unused cable as part of our standard business practice especially in retrofit jobs. The amount of old cable on some jobs has caused damage to the building and created unsafe working conditions for our techs. We support continuing the abandoned cable removal requirement in the Code.

**Panel Meeting Action:** Accept

**Ballot Results:** Affirmative: 13

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**Section 725.2**

**Panel Statement:** The technical correlating committee directs that the text of the first sentence of 725.3(B) be revised for clarity as follows: “Installation of Class 1, Class 2, and Class 3 circuits shall comply with 300.21.”

**Submitter:** Allen C. Weidman, The Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Accept this proposal in principle by moving the requirement to remove abandoned cables to new section 725.25.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 725.3(B) and 760.2(B)**

**Panel Statement:** The added text to 725.3(B) does not change the intent of the reference to 300.21 but provides the mandatory text to refer to both the NEC and the NEC Style Manual. The accessible portion of abandoned Class 2, Class 3, and PLTC cables shall be removed.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Accept this proposal in principle by moving the requirement to remove abandoned cables to new section 725.25.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables.

**Panel Meeting Action:** Accept

**Panel Statement:** The added text to 725.3(B) and mandatory text to reference 300.21 as follows: 725.3(B) Spread of Fire or Products of Combustion. Section 300.21 shall provide the requirements for installations concerning the spread of fire or products of combustion. The accessible portion of abandoned Class 2, Class 3, and PLTC cables shall be removed.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables and of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 300.11**

**Panel Statement:** The added text to 725.3(B) does not change the intent of the reference to 300.21 but provides the mandatory text to refer to both the NEC and the NEC Style Manual. See the panel action on Comment 3-111.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings and PLTC cables shall be removed.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 300.11**

**Panel Statement:** The added text to 725.3(B) and mandatory text to reference 300.21 as follows: 725.3(B) Spread of Fire or Products of Combustion. Section 300.21 shall provide the requirements for installations concerning the spread of fire or products of combustion. The accessible portion of abandoned Class 2, Class 3, and PLTC cables shall be removed.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 300.11**

**Panel Statement:** The added text to 725.3(B) does not change the intent of the reference to 300.21 but provides the mandatory text to refer to both the NEC and the NEC Style Manual. See the panel action on Comment 3-111.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 300.11**

**Panel Statement:** The added text to 725.3(B) does not change the intent of the reference to 300.21 but provides the mandatory text to refer to both the NEC and the NEC Style Manual. See the panel action on Comment 3-111.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 300.11**

**Panel Statement:** The added text to 725.3(B) does not change the intent of the reference to 300.21 but provides the mandatory text to refer to both the NEC and the NEC Style Manual. See the panel action on Comment 3-111.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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**Section 300.11**

**Panel Statement:** The added text to 725.3(B) does not change the intent of the reference to 300.21 but provides the mandatory text to refer to both the NEC and the NEC Style Manual. See the panel action on Comment 3-111.

**Submitter:** Allen C. Weidman, Society of the Plastics Industry, Inc.

**Comment on Proposal No:** 3-148

**Recommendation:** Continue to reject this proposal.

**Substantiation:** The Society of the Plastics Industry supports the removal of abandoned cables. One of our member companies is in the business of removing abandoned cables from buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13
Report on Comments 2007 — Copyright, NFPA

NFPA 70

Explanation of Negative:

CASPARRO, P.: Cable ties were designed to tie cables together not to support cables. I realize that we are talking about Class 1, Class 2 and Class 3 cables and if we start to support multiple cables in a bundle, we are looking at serious safety issues. With no strength requirement and minimum spacing intervals this installation can be an accident waiting to happen.

EGESDAL, S.: This comment should have been rejected, based on the Standards Council’s decision on NFPA 90A. UL lists cable ties for installation in HVAC system plenums. Rejecting this comment would be consistent with the action taken by Panel on comments 3-134, 3-164, and 3-176, which suggested a trivial editorial change to NFPA 262 listing requirements. The Panel used the NFPA 90A directive to reject these 3 comments. Additionally, the submitters of comments did not provide technical substantiation to support the proposal 3-155, as follows.

“Current practice today is to use a cable tie as a sole support for a cable when there is no spacing requirement provided for the distance between supports.” Further, the proposals, comments, and panel statements provide no technical substantiation for panel action that would require all hardware used to support cables to be listed. Of course, cable ties could not pass this standard, however, hangers, staples, straps and indent sensitive data cable bundles. No requirement to not use them for hanging cables! Cable bundles and conduit are attached safely to structures and substructures with listed support hardware tested according to UL 2239 (ANSI approved) “Hardware for the Support of Conduit, Tubing, and Cable”. Most cable ties could not pass this standard, however, hangers, staples, straps and beam clamps have to in order to become listed. This is why signs and NFPA should not sanction this industry “practice.”

OWEN, S.: Cables ties were originally introduced to tie cables together in bundles - not to support cables. Generally when installing cable ties, the application does not require a special strength rating of the cable tie, or spacing instructions. If one or more cable ties installed in a run of cables degrades or rips apart (breaks), there is no safety issue when these bundles are contained in cable trays, surface raceways, J-hooks and the like.

The issue of safety changes if the cable ties are installed as the means of support, rather than bundling cables together. With no strength requirement and maximum spacing interval, this installation can be a catastrophe in waiting. I know about a project, Cable Tie, designed to break at about 25 lbs. so not to pull apart (breaks), there is no safety issue involved when these bundles are contained in cable trays, surface raceways, J-hooks and the like.

The issue of safety changes if the cable ties are installed as the means of support, rather than bundling cables together. With no strength requirement and maximum spacing interval, this installation can be a dangerous installation. Cable bundles and conduit are attached safely to structures and substructures with listed support hardware tested according to UL 2239 (ANSI approved) “Hardware for the Support of Conduit, Tubing, and Cable”. Most cable ties could not meet the requirements of this standard, whereas, hangers, staples, straps and beam clamps are required to meet this standard in order to become listed.

The use of cable ties as support devices is a safety issue and should not be permitted.

Comment on Affirmative:

AYER, L.: Cable ties are included in similar text in Articles 320, 330, and 334. These items have provided support for Type AC, Type MC, and Type NM cables for years without incident or hazard. To not allow cable ties to be used to support Class 2 or Class 3 low voltage and low energy wiring would not be consistent with the other parts of the code. Since cable ties can support the far heavier lighting methods mentioned in Chapter 3, they should also be allowed to be used to support Class 2 or Class 3 low voltage wiring methods in Article 725.

EASTER, L.: The panel should have accepted Comment 3-102 by T. McNeive and specified a minimum loop tensile strength that provides primary support for such cables and that the cables need not be listed.

3-102 Log #484 NEC-P03 Final Action: Accept in Part (725.8)

Submitter: Timothy P. McNeive, Thomas & Betts Corporation

Comment on Proposal No: 3-155

Recommendation: Change the panel action to Accept in Principle. Add the additional text suggested in the comment on negative vote by Mr. Easter:

“Cable ties that provide primary support for such cables shall have a minimum loop tensile strength specified in Table 725.81. It is not acceptable to use a cable tie to serve as a sole support for a cable when there is no spacing requirement provided for the distance between supports.”

Substantiation: “Minimum loop tensile” strength is commonly marked on packages of cable ties. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The panel is also asked to follow the long time positions of CMP-7 and 8 and not consider in its final decision, the requirement that cable ties or other support hardware to be listed.

Panel Meeting Action: Accept in Part

The panel accepts adding cable ties as a permitted method to support Class 1, Class 2, and Class 3 cables. The panel rejects the recommendation to add the sentence requiring that cable tie have a minimum tensile strength.

Panel Statement: Cable ties can be used for securing and supporting cables in a minimum of Chapter 3 wiring methods without any requirements for a minimum loop tensile strength.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

CASPARRO, P.: See my explanation of negative vote on Comment 3-101.

EASTER, L.: The panel should have accepted this comment to add the minimum loop tensile strength for cable ties that provide primary support for such cables and that cable ties need not be listed.

KEDEN, R.: See my Explanation of Negative Vote on Comment 3-101.

OWEN, S.: See my explanation of negative vote on Comment 3-101.

Comment on Affirmative:


3-103 Log #605 NEC-P03 Final Action: Reject (725.8)

Submitter: Jamie McNamara, Hastings, MN

Comment on Proposal No: 3-152

Recommendation: The panel should consider this proposal and except it.

Substantiation: To harmonize Article 725 with the requirements in Articles 770, 800, 820 and 830 is important to ensure that similar cable types comply with the same rules makes for good code (understandable and enforceable for all). If there are inconsistent and unnecessary requirements in the code, let’s work to change them all in this code cycle and the next for now, and in the future, let’s make the text the same for the same types of cable installations.

Panel Meeting Action: Reject

Panel Statement: Class 1 circuits are required by 725.25 to comply with Part I of Article 300, so the addition of the reference to 300.11 would only affect Class 2 and Class 3 circuits. There was no technical substantiation provided in the proposal to require Class 2 and 3 cables to comply with Section 300.11. For example, to require low-energy thermostat cables to be supported above an accessible ceiling and comply with the same requirements as Types MC and AC cables would be overkill for absolutely no safety reason. The NEC should not be required to be consistent between articles where there are no apparent safety issues involved in the requirement. Power wiring was required to be supported independently since there was a real possibility of damage to the conductors within raceways if the wire support clips were removed without replacement and the raceways were allowed to sag without support.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

EASTER, L.: The comment should have been accepted. Acceptance of this comment will require that signaling cables installed above suspended ceilings be supported in accordance with 300.11. Even if the reference to 300.11 in Article 725 is consistent with the requirements for Chapter 3 wiring methods as well as communications cables covered by Articles 770, 800, 820 and 830, there is no reason that Article 725 wiring methods should be exempted.

3-104 Log #847 NEC-P03 Final Action: Accept (725.8)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 3-156

Recommendation: The panel is encouraged to continue to Reject Proposal 3-156.

Substantiation: The reasons to continue to Reject the Proposal are as follows:

1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and only mention the FPN and does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference instruction manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference

70-479
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-105 Log #1265 NEC-P03 Final Action: Reject (725.8 (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Comment on Proposal No: 3-155

Recommendation: Continue to Reject Proposals 3-155 and 3-225.

Substantiation: I agree with the panels reasons to reject. Additionally, as I pointed out in my comment in the affirmative, UL lists cable ties for installation in plenums, so the Council’s directive on NFPA 90A applies.

Panel Meeting Action: Reject

Panel Statement: Cable ties can be used for securing and supporting cables in a number of Chapter 3 wiring methods. There has not been any technical substantiation submitted to restrict cable ties from supporting various Class 1, Class 2, and Class 3 wiring methods.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 10 Negative: 3

3-106 Log #1335 NEC-P03 Final Action: Reject (725.8)

Submitter: Kevin McCall, Local Union #98 IBEW

Comment on Proposal No: 3-152

Recommendation: Revise text as follows:

725.8 Mechanical Execution of Work. The installation shall also conform with 300.4(D) and 300.11.

Substantiation: To harmonize with the requirements in articles 770, 800, 820 and 300. In agreement with Mr. Casparro’s statement that these Class 2 and Class 3 cable are no less a danger than the cables in other articles where 300.11 is a requirement.

Panel Meeting Action: Reject

Panel Statement: See the panel statement on Comment 3-103.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

EASTER, L.: See NEMA recommendation and my explanation of negative vote on Comment 3-103.

3-107 Log #1805 NEC-P03 (725.8)

Final Action: Accept

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 3-155

Recommendation: This proposal should have been accepted.

Substantiation: The panel statement is unresponsive to the proposal, and considering the other support methods listed, borders on nonsense. If "it is not acceptable to use a cable tie" because "there is no spacing requirement provided for distance between supports," then none of the other methods (straps, staples, hangers, or similar fittings) should be acceptable either. As noted in the proposal, cable ties are already recognized for numerous other wiring methods that are much heavier than the cables covered by Article 725 and cable ties have been accepted as support methods by Panels 7, 12, and 16, so the rejection of this proposal is highly inconsistent and unjustified. As noted in the Explanations of Negative, cable ties are already permitted in many places under the language "or similar fittings," but consistency in the code is highly desirable and directly addresses the ongoing issue of usability.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 10 Negative: 3

3-108 Log #759 NEC-P03 Final Action: Reject (725.15)

Submitter: David B. Wechsler, The Dow Chemical Company

Comment on Proposal No: 3-142

Recommendation: Revise as follows:

725.15 Class 1, Class 2, and Class 3 Circuit Requirements

A remote control, signaling, or power-limited circuit shall comply with the following parts of this article:

(1) Class 1 Circuits: Parts I and II
(2) Class 2 and Class 3 Circuits: Parts I and III

Substantiation: The intent of this proposal is not to eliminate remote control, etc., rather clarify within this General Part 1 section of Article 725 to better define what specific sections apply. Therefore the Requirements for Class I Circuits are found in Parts I and II of this Article; Class 2 and Class 3 are found in Parts I and III of this Article. 725.11 still continues to address remote-control circuits which in some cases need to be considered as Class 1. Power Limited circuits are addressed in the appropriate article parts, as defined by the circuit, and equally so are signaling circuits.

Panel Meeting Action: Reject

Panel Statement: Deleting the introductory text in this section would not be a user friendly change. The mandatory text in 725.15 provides the requirement that Class 1 remote control, signaling, or power-limited circuits must comply with Parts I and II and Class 2 and 3 must comply with Parts I and III. Deleting the mandatory text would take away any requirement for compliance.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-109 Log #2165 NEC-P03 Final Action: Accept in Principle (725.16)


Comment on Proposal No: 3-158

Recommendation: Accept the Proposal.

Substantiation: The title of Section 725.3 is “Other Articles”. The requirement for the removal of abandoned cables is not in another article; it is in Article 725. It is out of place in section 725.3. This proposal will move it to a new section of Article 725.

The current placement of the requirement for the removal of abandoned cables in sections 640.3, 725.3, 760.3, 770.3, 800.3, and 820.3 is an error. The error was made by Panel 16 in processing the 2002 NEC. Panel 16 recognized these errors and corrected them by accepting the movement of these requirements in its actions on Proposals 16-31, 128, 254, 259, and 361.

Moving the removal requirements to sections 725.25 and 760.25 will create parallelism between Articles 725, 760, 770, 800, 820, and 830.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action on Comment 3-111.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-110 Log #760 NEC-P03 Final Action: Reject (725.21)

Submitter: David B. Wechsler, The Dow Chemical Company

Comment on Proposal No: 3-142

Recommendation: Revise as follows:

725.21 Class 1 Circuit Classifications and Power Source Requirements.

Class 1 circuits shall be classified as either Class I power-limited circuits where they comply with the power limitations of 725.21(A) or as Class 1 nonpower-limited remote control and signaling circuits where they are used for remote control or signaling purposes and comply with the power limitations of 725.21(B).

FPN: Remote-control and signaling circuits are examples of Class I, nonpower-limited circuits.

(A) Class 1 Power-Limited Circuits. These circuits shall be supplied from a source that has a rated output of not more than 30 volts and 1000 volt-amperes.

(B) Class I Nonpower-Limited Remote Control and Signaling Circuits. These circuits shall not exceed 600 volts. The power output of the source shall not be required to be limited.

Remote-control and signaling are just subsets of either of these types of Class I circuits. The suggested changes simply clarify, but do not delete, any requirements.

Panel Meeting Action: Reject

Panel Statement: Deleting the text and adding a fine print note with similar information as already located in the existing Code, as requested in the comment, does not provide any clarification.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13
3-113 Log #668 NEC-P03
(725.26(B)(4))

Final Action: Reject

Panel Meeting Action: Accept in Principle

Revise 725.26(B)(4) to read:

(4) In Cable Trays. Installations in cable trays shall comply with 725.26(B)(4)(1) or 725.26(B)(4)(2).

1) Class 1 circuit conductors and power-supply conductors not functionally associated with the Class 1 circuit conductors shall be separated by a solid fixed barrier of a material compatible with the cable tray.

2) Class 1 circuit conductors and power-supply conductors not functionally associated with the Class 1 circuit conductors shall be permitted to be installed in a cable tray without barriers where all of the conductors are installed within separate multicore Type AC, Type MC, Type MI, or Type TC cables and all of the conductors in the cable trays are insulated at 600 volts.

Panel Statement: The word “separate” was added after “within” and before “multiconductor” to ensure that where the Class 1 circuits and the power supply conductors are not functionally associated, separate cables will be installed, one for the Class 1 and one for the power-supply conductors. The remainder of the comment was accepted. The text has been rearranged for clarity.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

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3-111 Log #547 NEC-P03
(725.25 (New) and 760.25 (New))

Final Action: Accept

Panel Meeting Action: Accept in Principle

TCC action: The Technical Correlating Committee directs that the Fine Print Notes contained in the recommendation be deleted because they contain a statement of intent. The Technical Correlating Committee notes that the rules as written in the recommendation are clear in that they apply to the accessible portion of the abandoned cable.

Submitter: Richard P. Owen, City of St. Paul

Comment on Proposal No: 3-140

Recommendation: Create 725.25 (New) and 760.25 (New) as shown below:

725.25 Abandoned Cables. The accessible portion of abandoned Class 2, Class 3, and PITC cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

FPN: See Article 100 for a definition of accessible. It is desirable to remove as much abandoned cable as is practical, but it is not the intent of this section to require construction or renovation specifically to facilitate the removal of abandoned cable.

760.25 Abandoned Cables. The accessible portion of abandoned fire alarm cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

FPN: See Article 100 for a definition of accessible. It is desirable to remove as much abandoned cable as is practical, but it is not the intent of this section to require construction or renovation specifically to facilitate the removal of abandoned cable.

Substantiation:

This comment was written by a Task Group consisting of Stan Kaufman and Randy Ivans (Panel 16), John Mortimer (Panel 12) and Ron Maassen, Paul Gasparro (Panel 3) plus Task Group Chair Richard Owen (Panel 3). The Task Group was directed by the Technical Correlating Committee to examine proposals submitted to all three Panels concerning abandoned cable and other related issues covered by the Panels.

The Task Group came to consensus on the following issues and submitted comments to the Panels as appropriate:

1) On the issue of abandoned cable removal, the task group agreed that only the accessible portions of abandoned cable should be removed. To require removal of all cable could, in some cases, necessitate demolition of the building finish in order to access cables that were properly fastened to the building in accordance with the rules in the existing code articles. Furthermore, the task group agreed that the requirements for abandoned cable removal should not be in Section X.3 (Locations and Other Articles) but should be relocated into the general requirements of each article.

2) The task group also agreed to recommend the addition of a new Fine Print Note to further clarify the removal requirement. This addition was thought to be necessary to address a common practice of cables that are “fished” inside existing walls. These cables, if abandoned, can be disconnected from their junction point in a wall and pulled out of the wall without having to harm the building finish. At present, in many cases, these cables are being cut off above the wall and left to drop into the wall space.

3) On the issue of “tagged for future use”, the Task Group agreed that it was not necessary to require anything more than the cable tag being “…of sufficient durability to withstand the environment involved.” This phrase is used in several other places in the NEC and leaves it up to the AHJ as to what is suitable. This language does not add requirements that are difficult, if not impossible, to enforce by adding unclear requirements for rodent-resistance, etc.

The current placement of the requirement for the removal of abandoned cables in sections 640.3, 725.5, 760.3, 770.3, 800.3 and 820.3 is an error. The error was made by panel 16 in processing the 2002 NEC. Panel 16 recognized these errors and corrected them by accepting the movement of these requirements in its actions proposals 16-31,128, 254, 259 and 361.

Panel 3 should not attach too much significance to the fact that the removal requirements are in the “Other Articles” section; it was a mistake that needs to be fixed. Moving the removal requirements to sections 725.25 and 760.25 will create parallelism between Articles 725, 760, 770, 800, 820 and 830.

Panel Meeting Action: Accept

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

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3-112 Log #622 NEC-P03
(725.26(B)(4))

Final Action: Accept in Principle

Submitter: Richard P. Owen, City Of St. Paul

Comment on Proposal No: 3-160

Recommendation: This Proposal should have been Accepted in Principle in Part not by accepting the addition of “Type TC” and the removal of solid fixed barriers. The only change should be that the last phrase of the existing section be revised to read:

“...or where the power-supply or Class 1 circuit conductors are in a multicore Type AC, Type MC, or Type MI cable.”

I agree with the panel action to change the wording “Multi-conductor to “multiconductor”.

Substantiation:

All of the cable types listed in the Proposal, except for Type TC, have a metallic sheath or armor (metal-enclosed) that provides an equipment grounding path in addition to physical protection.

I agree that specifically identifying the cable types permitted is much more useful to the user than merely stating “metal-enclosed”.

When 725.26(B)(4) was added, the intent was to not only provide physical protection, but also provide an equipment grounding path between power supply conductors and Class 1 circuit conductors so that, in the event of a malfunction in any power supply conductors, that power would not be imposed onto adjacent Class 1 circuit conductors, particularly onto Class 1 circuit conductors not functionally associated with the power supply conductors. This requirement is consistent with the requirement in 725.26(B)(1).

Also, the text that currently appears in the 2005 NEC has been in the Code since the 1951 NEC, which the Panel pointed out in the panel statement. Type TC cable did not exist at that time and was not added until the 1975 NEC.

No technical substantiation has been provided to support the contention that Type TC provides equivalent mechanical and electrical protection as a “metal-enclosed cable”, particularly as related to providing equipment grounding and physical protection between power supply conductors and Class 1 circuit conductors not functionally associated with the power supply conductors. This proposed text would be inconsistent with similar requirements in 725.25(B).

The panel rewrite imposes additional restrictions beyond those that appear in the 2005 NEC. The panel rewrite requires that both the Class 1 circuit conductors and the power supply conductors be contained within a multicore cable whereas the current text only requires that either “the power-supply or Class 1 circuit conductors are in a metal-enclosed cable.” This requirement would apply to “functionally associated” circuit wiring as well as those not “functionally associated”. No technical substantiation was provided to support this more stringent requirement.

The panel rewrite deletes one of the provisions of providing a “solid fixed barrier” to separate power supply conductors from Class 1 circuit conductors not functionally associated with the power supply conductors. No technical substantiation was provided to support elimination of this option nor that a safety problem exists with the use of a solid fixed barrier.

The change to “multiconductor” provided an editorial correction for consistency. Multiconductor is not hyphenated. In the 2005 NEC, the word “multi-conductor” is only used in Articles 690 and 810 and Annex D. The word “multiconductor” is used in 31 Articles, Chapter 9, and Annex B.

Panel Meeting Action: Reject

Panel Statement: The definition of Power and Control Tray Cable (Type TC) is a factory assembly of two or more insulated conductors, with or without associated bare or covered grounding conductors, under a nonmetallic jacket. TC cable has an overall nonmetallic jacket that acts as mechanical protection...
and is not relying just on the insulation of the individual conductors as a means of separation from the other circuits.

**Number Eligible to Vote:** 13  
**Ballot Results:** Affirmative: 13

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3-114 Log #669 NEC-P03  
**Final Action:** Rejected  
(725.26(B)(4))

**Submitter:** James M. Daly, Upper Saddle River, NJ  
**Comment on Proposal No:** 3-162  
**Recommendation:** This Proposal should be Accepted in Principle in Part by not accepting the addition of “Type TC” and the removal of solid fixed barriers. The only change should be that the last phrase of the existing section be revised to read: “...or where the power-supply or Class 1 circuit conductors are in a metal-enclosed cable.”  
I agree with the panel action on Proposal 3-160 to change the word “Multi-conductor” to “metal-clad.”  
**Substantiation:** See the substantiation in my comment on Proposal 3-160.

**Panel Meeting Action:** Reject  
**Panel Statement:** See the panel statement on Proposal 3-113.

**Number Eligible to Vote:** 13  
**Ballot Results:** Affirmative: 13

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3-115 Log #761 NEC-P03  
**Final Action:** Accepted in Principle  
(725.26(B)(4))

**Submitter:** David B. Wechsler, The Dow Chemical Company  
**Comment on Proposal No:** 3-160  
**Recommendation:** Continue to support the actions taken at the ROP stage based upon the Task Group recommendations and the actions by the Code Panel to revise text to read as follows:  
(4) In Cable Trays. In cable trays, where the Class 1 circuit conductors and power supply conductors not functionally associated with them are separated by a solid fixed barrier of a material compatible with the cable tray, or where the power-supply or Class 1 circuit conductors are in a metal-enclosed cable.  
In cable trays Class 1 circuit conductors and power-supply conductors, within multiconductor Type AC, Type MC, or Type MI cables shall be permitted to be installed in a cable tray without barriers where all the conductors in the cables are insulated at 600 volts.

**Substantiation:** I appreciate the actions of the Task Group and the committee action in taking the above action which resolves this issue. In passing, I still understand the NEC to distinguish between a cable tray and a raceway; thereby making them different.

**Panel Meeting Action:** Accept in Principle  
**Panel Statement:** The panel action and statement on Comment 3-112 address the submitter’s recommendation.

**Number Eligible to Vote:** 13  
**Ballot Results:** Affirmative: 13

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3-116 Log #920 NEC-P03  
**Final Action:** Rejected  
(725.26(B)(4))

**Submitter:** Peter D. Noval, Jr., Philadelphia, PA  
**Comment on Proposal No:** 3-163  
**Recommendation:** This proposal should be rejected. Revise proposed text so that 725.26(B)(4) reads as follows:  
(4) In Cable Trays. In cable trays, where the Class 1 circuit conductors and power-supply conductors not functionally associated with them are separated by a solid fixed barrier of a material compatible with the cable tray, or where the power-supply or Class 1 circuit conductors are in a metal-enclosed cable.  
In cable trays Class 1 circuit conductors and power-supply conductors, within multiconductor Type AC, Type MC, or Type MI cables shall be permitted to be installed in cable trays without barriers where all conductors in the cables are insulated at 600 volts or greater.

**Substantiation:** There is no technical substantiation provided for lessening the requirements of this section by allowing the installation of Type TC cable in cable trays without barriers between the Class 1 circuit conductors and power supply conductors not functionally associated with them, regardless of the type of insulation utilized.

To further support rejection of this proposal, refer to the following three panel statements, from NFPA 70 - May 2001 ROIC and May 2004 ROP, regarding the originating proposal for 725.26(B)(4) and the intent of the panel:  
"Proposal 16-51a provides for separation of circuits in cable trays in a manner consistent with other wiring methods in Article 725 and provides restrictions beyond those provided in Chapter 3."  
Panel Statement from Comment #16-60 (May 2001 ROC):

"The intent of the panel is to require that in cable tray  
1) Physical separation other than insulation, or  
2) That the power supply circuits be functionally associated with the Class 1 circuits."  
Panel Statement from Proposal #3-151 (May 2004 ROP):

"Requiring a barrier or a metal-enclosed cable separates Class 1 power-limited and nonpower-limited circuits from other circuits that are not functionally associated. Normally, low voltage circuits are isolated from power, lighting, and other higher voltage circuits to keep possible short circuits from affecting the higher rated circuits from affecting the lower rated circuits. This separation rule is relaxed somewhat for Class 1 circuits if the same equipment is powered and controlled by conductors run together. In most instances, the disconnecting means for the equipment and the control circuits will be in close proximity to each other so that power can be shut down for the machine: i.e., functionally associated. Permitting both power and Class 1 control in the same cable tray, raceway, or enclosure provides a more efficient use of the wiring method without seriously compromising safety."  
Proposal 3-162, as submitted, would permit insulation as the only means for separation where Type TC cable is installed in cable tray, without barriers between Class 1 circuit conductors and non-functionally associated power-supply conductors.

The revised text above, corrects this.

**Panel Meeting Action:** Reject  
**Panel Statement:** Revising the proposed text is a better answer than total rejection of the proposal. See the panel action on Comment 3-114. Metal-enclosed cable is more correctly addressed as Type AC (armored cable), MC (metal clad) cable, or MI (mineral insulated) cable. See the panel statement on Comment 3-113 regarding the use of Type TC cable.

**Number Eligible to Vote:** 13  
**Ballot Results:** Affirmative: 13

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3-117 Log #921 NEC-P03  
**Final Action:** Rejected  
(725.26(B)(4))

**Submitter:** Peter D. Noval, Jr., Philadelphia, PA  
**Comment on Proposal No:** 3-161  
**Recommendation:** This proposal should be rejected. Revise proposed text so that 725.26(B)(4) reads as follows:

(4) In Cable Trays. In cable trays, where (1) the power-supply conductors are run in wiring methods, listed in Table 722.3(A), or where (2) the power supply conductors are run as single conductors as covered in 722.3(B)(1) and all Class 1 circuit conductors not functionally associated with them are separated by a solid fixed barrier of a material compatible with the cable tray, or where the Class 1 circuit conductors are in a metal-enclosed cable.  
In cable trays Class 1 circuit conductors and power-supply conductors not functionally associated with them are separated by a solid fixed barrier of a material compatible with the cable tray, or where the Class 1 circuit conductors are in a metal-enclosed cable.

**Substantiation:** There is no technical substantiation provided for lessening the requirements of this section by allowing the installation of Type TC cable in cable trays without barriers between the Class 1 circuit conductors and power supply conductors not functionally associated with them, regardless of the type of insulation utilized.

To further support rejection of this proposal, refer to the following three panel statements, from NFPA 70 - May 2001 ROC and May 2004 ROP, regarding the originating proposal for 725.26(B)(4) and the intent of the panel:  
"Proposal 16-51a provides for separation of circuits in cable trays in a manner consistent with other wiring methods in Article 725 and provides restrictions beyond those provided in Chapter 3."  
Panel Statement from Comment #16-57 (May 2001 ROC):

"The intent of the panel is to require that in cable tray  
1) Physical separation other than insulation, or  
2) That the power supply circuits be functionally associated with the Class 1 circuits."  
Panel Statement from Proposal #3-151 (May 2004 ROP):

"Requiring a barrier or a metal-enclosed cable separates Class 1 power-limited and nonpower-limited circuits from other circuits that are not functionally associated. Normally, low voltage circuits are isolated from power, lighting, and other higher voltage circuits to keep possible short circuits from affecting the higher rated circuits from affecting the lower rated circuits. This separation rule is relaxed somewhat for Class 1 circuits if the same equipment is powered and controlled by conductors run together. In most instances, the disconnecting means for the equipment and the control circuits will be in close proximity to each other so that power can be shut down for the machine: i.e., functionally associated. Permitting both power and Class 1 control in the same cable tray, raceway, or enclosure provides a more efficient use of the wiring method without seriously compromising safety."  
Proposal 3-162, as submitted, would permit insulation as the only means for separation where Type TC cable is installed in cable tray, without barriers between Class 1 circuit conductors and non-functionally associated power-supply conductors.

The revised text above, corrects this.

**Panel Meeting Action:** Reject  
**Panel Statement:** Revising the proposed text is a better answer than total rejection of the proposal. See the panel action on Comment 3-112. Metal-enclosed cable is more correctly addressed as Type AC (armored cable), MC
In Cable Trays.

"Requiring a barrier or a metal-enclosed cable separates Class 1 power-supply conductors not functionally associated with them are separated by a solid fixed barrier of a material compatible with the cable tray, or where the power-supply or Class 1 circuit conductors are in a metal-enclosed cable, in cable trays Class 1 circuit conductors and power-supply conductors not functionally associated with them, regardless of the type of insulation utilized.

To further support rejection of this proposal, refer to the following three panel statements, from NFPA 70 - May 2001 ROC and May 2004 ROP, regarding the originating proposal for 725.26(B)(4) and the intent of the panel:

Panel Statement from Comment #16-57 (May 2001 ROC):
“Proposal 16-51a provides for separation of circuits in cable trays in a manner consistent with other wiring methods in Article 725 and provides restrictions beyond those provided in Chapter 3.”

Panel Statement from Comment #16-60 (May 2001 ROC):
“The intent of the panel is to require that in cable tray 1) Physical separation other than insulation, or 2) That the power supply circuits be functionally associated with the Class 1 circuits.”

Panel Statement from Proposal #3-151 (May 2004 ROP):
“Requiring a barrier or a metal-enclosed cable separates Class 1 power-limited and nonpower-limited circuits from other circuits that are not functionally associated. Normally, low voltage circuits are isolated from power, lighting, and other higher voltage circuits to keep possible short circuits from affecting the power-limited circuits. This separation rule is relaxed somewhat for Class 1 circuits if the equipment is powered and controlled by conductors run together. In most instances, the disconnecting means for the equipment and the control circuits will be in close proximity to each other so that power can be shut down for the machine: i.e., functionally associated. Permitting both power and Class 1 control in the same cable tray, raceway, or enclosure provides a more efficient use of the wiring method without seriously compromising safety.”

Proposal 3-160, as submitted, would permit insulation as the only means of separating Class 1 circuit conductors from conductors not functionally associated with them, regardless of the type of insulation used.

The revised text above, corrects this.

Panel Meeting Action: Reject
Panel Statement: Revising the proposed text is a better answer than total rejection of the proposal. See the panel action on Comment 3-112. Metal-enclosed cable is more correctly addressed as Type AC (armored cable), MC (metal clad cable), or MI (mineral insulated cable). See the panel statement on Comment 3-113 regarding the use of Type TC cable.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Historically, the voltage rating of insulation has not been permitted as a means of separating Class 1 conductors from conductors not functionally associated with the Class 1 conductors.

Class 1 conductors may be Type TFN. Class 1 circuits are permitted to be installed with non-power-limited fire alarm circuits. Permitting Class 1 and fire alarm conductors to be in physical contact with non-associated power-supply conductors may pose a risk to life safety.

The proposed text is an attempt to clarify that a barrier is not necessary if either the Class 1 conductors or non-associated power-supply conductors are in metal-enclosed cable.

Panel Meeting Action: Reject
Panel Statement: Metal-enclosed cable is more correctly addressed as Type AC (Armored Cable), MC (Metal Clad cable, or MI (Mineral Insulated) cable. In 725.26(B)(3)(l)), the acceptable cable is metal-covered or UF, a thermoplastic jacketed cable without the flame retarded of a TC cable. TFN conductors are not permitted in cable trays, unless within a jacketed or metal sheathed cable. See the panel statement on Comment 3-113.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
proximity to each other so that power can be shut down for the machine, i.e., functionally associated. Permitting both power and Class 1 control in the same cable tray, raceway, or enclosure provides a more efficient use of the wiring method without seriously compromising safety.

Proposal 3-163, as submitted, would permit insulation as the only means for separation where Type TC cable is installed in cable tray, without barriers between Class 1 circuit conductors and non-functionally associated power-supply conductors. The deleted text above, corrects this.

Panel Meeting Action: Reject

Panel Statement: Revising the proposed text is a better answer than total rejection of the proposal. See the panel action on Comment 3-112. Metal-enclosed cable is more correctly addressed as Type AC (armored cable), MC (metal clad cable), or MI (mineral insulated cable). See the table statement on Panel Meeting Action: Reject

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: Sanford Egesdal, Egesdal Associates PLC

Comment on Proposal No: 3-164
Recommendation: Reconsider Proposal 3-164 and Accept in Principle using the text shown below. The numbering shown corresponds to the “parallel” rerouting in Article 760 for non-power-limited fire alarm cable.

275.53 Multiconductor Class 1 Cables. Multiconductor Class 1 cables that meet the requirements of 725.176 shall be permitted to be used on remote-control, signaling, and power-limited circuits operating at 150 volts or less and shall be installed in accordance with 725.53(A) and 725.53(B).

(A) Class 1 Wiring Method. Multiconductor Class 1 circuit cables shall be installed in accordance with 725.53(A1), (A2), and (A3).

(1) Exposed or Fished in Concealed Spaces. In raceway or exposed on surface of ceiling and sidewalls or fished in concealed spaces. Cable splice terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall. In metal raceway or rigid nonmetallic conduit where passing through a floor or wall to a height of 2.1 m (7 ft) above the floor unless adequate protection can be afforded by building construction such as detailed in 725.53(A1) or unless an equivalent solid guard is provided.

(3) In Hoistways. In rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing where installed in hoistways.

Exception: As provided for in 620.21 for elevators and similar equipment.

(B) Applications of Listed Class 1 Cables. The use of Class 1 circuit cables shall comply with (B1) through (B4).

(1) Riser. Cables installed in vertical runs and penetrating more than one floor or cables installed in vertical runs in a shaft shall be Type CL1R. Floor penetrations requiring Type CL1R shall contain only cables suitable for riser or plenum use.

Exception No. 1: Type CL1 or other cables that are specified in Chapter 3 encased in metal raceway.

Exception No. 2: Type CL1 cables located in a fireproof shaft having firestops at each floor.

FPN: See 300.21 for firestop requirements for floor penetrations.

Exception No. 3: Type CL1 or Type CL1-C cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

(2) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 725.53(B1), (B2), and (B3) shall be Type CL1.

Exception No. 1: Other wiring methods in compliance with Chapter 3.

Exception No. 2: Type CL1 circuit cables shall be permitted.

Exception No. 3: Type CL1-C circuit cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

Substantiation: The Panel Statement indicates that a Listed Class 1 cable does not exist. That’s true. Until the Panel provides a listing and marking requirement for a Class 1 cable, it will not exist. The proposed Class 1 cable construction and is identical to non-power-limited fire alarm cable. The application of the Class 1 cable would be very similar to non-power-limited fire alarm cable.

The proposed reference in 725.81 does not exist in the 2005 NEC. That’s true. Until Panel provides a listing and marking requirement for a Class 1 cable, it will not exist.

There is an industry need for this cable. Hopefully, the Panel will decide to provide a listing and marking, and application.

In lieu of the research report requested by the Panel, this type of cable has been installed for fire alarm installations for decades. From conversations with cable manufacturers, it appears the many 10’s of millions of feet of non-power-limited fire alarm cable has been installed since the cable was permitted in Article 760. The application of the proposed Class 1 cable and non-power-limited fire alarm cable is the same for identical devices, but used for different systems. Here are a couple of examples.

Non-power-limited fire alarm cable can be connected to control a 120 VAC motor that operates a smoke damper. A Class 1 circuit to a 120 VAC motor for a temperature control damper shall be installed in raceway (typically, Type TFN or Article 3 conductors in EMT).

A similar application occurs for a mag-lock on a door that requires more power or higher voltage than permitted for Class 2, Class 3, or power-limited fire alarm systems. For a fire alarm system, the mag-lock can be connected to the fire alarm system with non-power-limited fire alarm cable. If the VAC mag-lock is part of a security system and the door is not an exit door, the connection to the security panel would be Class 1 circuit conductors in conduit.

There is an additional application that would benefit installers. Class 2 and Class 3 circuits can be reclassified as Class 1 circuits. If a Class 1 cable was available, the reclassified circuits could be installed with the Class 1 circuits in a Class 1 cable. This installation method has worked well for fire alarm systems for many years. That is power-limited fire alarm circuits are reclassified as non-power-limited circuits and permitted to be installed in non-power-limited cable (or in conduit) with non-power-limited circuits.

This type of cable has worked well for fire alarm systems, so it is reasonable to extend the same capability to Article 725 systems, such as security, temperature control, and access control.

Proposal Number: 3-170
Recommendation: Reconsider and accept Proposal 3-170.

Panel Meeting Action: Accept

Panel Statement: Listing for non-power-limited fire alarm cable is based on UL 1425, Cables for Non-Power-Limited Fire Alarm Circuits, and this listing does not cover Class 1 circuits. A manufacturer could submit a request to the UL Standards Technical Panel (STP) for either a change to the UL standard to permit this application or a separate standard to cover Class 1 cables, but at this point there isn’t a Class 1 cable or a standard that would specifically permit this application.

Panel Meeting Action: Reject

Panel Statement: Listing for non-power-limited fire alarm cable is based on UL 1425, Cables for Non-Power-Limited Fire Alarm Circuits, and this listing does not cover Class 1 circuits. A manufacturer could submit a request to the UL Standards Technical Panel (STP) for either a change to the UL standard to permit this application or a separate standard to cover Class 1 cables, but at this point there isn’t a Class 1 cable or a standard that would specifically permit this application.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Submitter: Gerald Lee Dorna, Belden

Comment on Proposal No: 3-170
Recommendation: Reconsider and accept Proposal 3-170.

Substantiation: In my proposal under the substantiation I advised the panel that similar proposals were made to Articles 725, 760, 800, 820 and 830. That similar text is already in Article 770. See below the actions taken on all of my proposals.

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<td>16-407</td>
<td>850.13(A)(1)</td>
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Panel 16 accepted all of the similar proposals. Panel 3 accepted one proposal (3-248) while rejecting another (3-170).

There seems to be inconsistency in the panel and should reconsider and accept proposal 3-170. The submitter may have chosen the wrong words “safely installed” when explaining why these cables should also be allowed in cable trays. I should have stated “Jacketed cables of Class 2 or Class 3 circuits shall be permitted in the same enclosure or raceway” then why not be non-power-limited in the same cable tray? My proposal had nothing to do with installation methods.

All of the following types (CL2P, CL2R, CL2, CL3P, CL3R, CL3) are UL Listed suitable for use in cable trays because they all meet the minimum flame test requirements for cable trays which is the Vertical Tray test per UL-1685. If they are permitted in the same enclosure and raceway as those cables specified in (1), (2), (3), (4), and (5), then they should also be permitted in the same cable tray as those cables specified in (1), (2), (3), (4), and (5).

Panel Meeting Action: Accept

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Panel 16 accepted all the proposals in the series. Panel 3 accepted the proposal for Article 760 while rejecting this proposal. All the cable Types shown below are listed as suitable for use in cable trays and should be permitted in the same cable tray in a building. Section 725.61 permits many of these cables to substitute for Class 2 and Class 3 cables.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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### Proposal 3-124 Log #803 NEC-P03

**Final Action:** Accept

**Submitter:** John Kincaid, Systimax Solutions

**Comment on Proposal No:** 3-170

**Recommendation:** Accept this proposal.

**Substantiation:** Mr. Dorna mentions in his substantiation that he submitted similar proposals for Articles 725, 760, 800, 820, and 830. He mentions that similar text is already in Article 770. The table below shows the actions taken by Panels 3 and 16.

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### Proposal 3-125 Log #1812 NEC-P03

**Final Action:** Accept

**Submitter:** Michael Walls, American Chemistry Council

**Comment on Proposal No:** 3-170

**Recommendation:** Accept this proposal.

**Substantiation:** In the panel's own words cable trays provide support for jacketed cables. This section covers jacketed cables. If jacketed cables of Class 2 and Class 3 circuits are permitted to be installed together in raceways then why can't they be installed together in cable trays? There is no justification to exclude cable trays from this application. The panel's implication that a cable tray system does not have to meet installation requirements is incorrect. Article 392 provides strict requirements for the installation of cable tray systems so that cables are not damaged during installation the same as the conduit Articles.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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### Proposal 3-126 Log #2166 NEC-P03

**Final Action:** Accept

**Submitter:** Ray R. Keden, Erico, Inc. / Rep. BICSI

**Comment on Proposal No:** 3-170

**Recommendation:** Accept this Proposal.

**Substantiation:** Panel 3 accepted the Proposal 3-248 for Article 760 while rejecting this proposal. Both proposals deal with the same concept. BICSI members routinely and safely install Class 2, Class 3, power-limited fire alarm, nonconductive optical fiber, conductive optical fiber, communications cables, CATV and low-power network-powered broadband cables that are general-purpose rated or better in the same cable tray. All of these cable types are suitable for installation in cable trays in buildings.

**Panel Meeting Action:** Accept

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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</table>

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**Additional Notes:**

- Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel's concurrence with the entire substantiation.
- **Number Eligible to Vote:** 13
- **Ballot Results:** Affirmative: 13

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**Report on Comments A2007 — Copyright, NFPA**

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**NFPA 70**

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**70-485**
Recommendation: Continue to reject the proposal in recommendation 3-173, retain the existing 725.61 (renumbered to 725.154 by panel action on proposal 3-138) except for (G) which should be changed as shown and renumber the titles of the Table and Figure:

Renumber Table 725.61 to be Table 725.154(G) and Figure 725.61 to be Figure 725.154(G).

3-130 Log #1062 NEC-P03  
Final Action: Reject

Submitter: David Shapiro, Safety First Electrical Contracting Consulting & Safety Education

Comment on Proposal No: 3-177

Recommendation: Revise text to read as follows:

“...physical damage of the sort that tends to be readily visible...”

Substantiation: NEC users rely on standard dictionary definitions, augmented by the NEC as explicit definitions. The NEC Style Manual provides for two meanings for figures, either they are mandatory and can have mandatory language (shall) or they are non-mandatory and are in a fine print note and do not contain mandatory language. This comment will bring the cable substitution figures into compliance with the style manual by making the cable substitution figures part of the mandatory text.

Similar corrections for Articles 760, 770, 800 and 820 are contained in other comments.

This Comment has been prepared by a Task Group established by the Technical Correlating Committee. The Task Group includes R. Owen, M. Ode, S. Owen, J. Brunssen, S. Kronin, S. Johnson, S. L. Stene and S. D. Kahn.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-129 Log #1597 NEC-P03  
Final Action: Accept

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute

Comment on Proposal No: 3-174

Recommendation: Continue to reject.

Substantiation: The submitter’s recommendation to add this FPN to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed spaces of noncombustible cables listed in Table 725.61F and illustrated in Figure 725.61F will be permitted to be installed in the concealed spaces provided that the cable is properly listed and labeled as “limited combustible.” Can the term “limited combustible” be replaced with the new term “noncombustible?”

The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-131 Log #1598 NEC-P03  
Final Action: Accept

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute

Comment on Proposal No: 3-180

Recommendation: Continue to reject.

Substantiation: The submitter’s recommendation to add this FPN to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed spaces of noncombustible cables listed in Table 725.61F and illustrated in Figure 725.61F will be permitted to be installed in the concealed spaces provided that the cable is properly listed and labeled as “limited combustible.” Can the term “limited combustible” be replaced with the new term “noncombustible?”

The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13
Minor quantities of combustible materials such as but not limited to:  
cabling, nonmetallic plumbing piping, non-structural wood, etc...  
can be present in concealed spaces constructed of limited or noncombustible  
materials but should not be viewed as requiring sprinklers (see 8.14.1.1).  
For example, it is not the intent of this section to require sprinklers, which would  
not otherwise be required, in the interstitial space of a typical office building  
solely due to the presence of the usual amount of cabling within the space.  
The threshold value at which sprinklers become necessary in the concealed space is  
not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that  
the normal amount of cabling would not require sprinklers due to the  
construction of the space. They also expanded the list of combustibles to  
provide examples of potential combustible loading.

8.14.1.2.1 Concealed Spacing not Requiring Sprinkler Protection.

Concealed spaces not otherwise be required, in the interstitial space of a typical office building  
solely due to the presence of the usual amount of cabling within the space.  
The threshold value at which sprinklers become necessary in the concealed space is  
not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that  
the normal amount of cabling would not require sprinklers due to the  
construction of the space. They also expanded the list of combustibles to  
provide examples of potential combustible loading.

C&MP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the recommendation, but this action does not  
indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13  
Negative: 0  
Abstained: 0  
Affirmative:13  
Negative:0  
Abstained:0  

3-133 Log #1700 NEC-P03  
(725.82)  
Final Action: Reject

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association

Comment on Proposal No: 3-194

Recommendation: Revise 725.82 as follows:  
(G) Class 2 and Class 3 Cable Voltage Ratings. Class 2 cables shall have a  
voltage rating of not less than 150 volts and a temperature rating of not less  
than 60°C (140°F). Class 2 cables shall have a voltage rating of not less than  
300 volts and a temperature rating of not less than 60°C (140°F).

(L) Marking. Cables shall be marked in accordance with 310.11(A)(2),  
(A)(3), (A)(4), and (A)(5) and Table 725.82. Voltage ratings shall not be  
marked on the cables. Temperature ratings greater than 60°C shall be marked  
on the cable.

FPN. Voltage markings on cables may be misinterpreted to suggest that the  
cables may be suitable for Class 1 electric light and power applications.  
Exception: Voltage markings shall be permitted where the cable has multiple  
applications and a voltage marking is required for one or more of the listings.

Substantiation: The proposed changes to 725(G) and (L) provide requirements  
that match present listing requirements, so will not impose a hardship on cable  
manufacturers.

Article 725 does not have a temperature rating requirement for cable. The  
temperature rating on cable is important for some installations. The proposed  
rating of 60°C (140°F) is used by testing laboratories as the required minimum  
temperature rating, but the temperature rating is not required to be marked on  
the cable.

Panel Meeting Action: Reject

Panel Statement: This comment does not add anything new except for  
marking, which is already covered by the product standard UL 13. The last  
sentence of the substantiation states that the proposed temperature rating is  
used by testing laboratories as the required minimum temperature rating, but  
since it is already in UL 13, adding the temperature rating to 725.82 is  
unnecessary.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

3-134 Log #655 NEC-P03  
(725.82(A), FPN )  
Final Action: Reject

Safety Council

Comment on Proposal No: 3-189

Recommendation: Revise text to read as follows:  
725.82 Listing and Marking of Class 2, Class 3, and Type PLTC Cables. Class 2,  
Class 3, and Type PLTC cables installed as wiring within buildings shall be  
listed as being resistant to the spread of fire and other criteria in accordance  
725.82(A) through 725.82(K) and shall be marked in accordance with  
725.82(L).

(A) Types CL2P and CL3P. Types CL2P and CL3P plenum cables shall be  
listed as being suitable for use in ducts, plenums, and other space used for  
environmental air and shall also be listed as having adequate fire-resistant and  
low smoke-producing characteristics.

FPN. One method of defining a cable that is low smoke-producing cable and  
fire-resistant cable is that the cable exhibits a maximum peak optical density  
of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame  
spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA  
262. Standard Method of Test for Flame Travel and Smoke of Wires and Cables  
for Use in Air-Handling Spaces.

Substantiation: This comment recommends a slight change in wording for the  
existing Fine Print Note, by recognizing that listing of plenum cables by NFPA  
262 represents listing to both low smoke and low flame spread, and that cables  
cannot be listed separately to either property. This is basically an editorial  
change, as a clarification, to the existing Fine Print Note.

The same change is being proposed to the corresponding Fine Print Notes in  
article 760. The new language is consistent with the language in the  
corresponding fine print notes in articles 770, 800, 820 and 830, all of which  
deal with the same type of cables.

70-487
The committee rejected the proposal based on, and I quote: “NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

"So as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A."

However, Standards Council has since issued a new decision, NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. This decision addresses CMP decisions on Fine Print Notes referencing NFPA 13 and it states, in pertinent part, as follows: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council's status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of these notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).”

I believe that this Standards Council decision, indirectly, applies to the Fine Print Note to which this comment refers, for two reasons:

1. As Tom Guida explains in his negative on this item, “With reference to the Panel Statement, this proposal does not change the "status quo" with regard to plenum cables. The proposal is essentially editorial. The proposed revised FPN actually aligns the wording of the FPN with the existing wording in NFPA 90A for plenum cables in ceiling and raised floor cavities.” In other words, the wording of the Fine Print Note in its existing form engenders confusion because it gives the erroneous impression that plenum cables could be listed separately for flame spread and for smoke, and that is incorrect.

2. This Fine Print Note is identical to the ones in 760.81 (C) and in 760.82 (D), both of which are equally incorrect and potentially misleading. On the other hand the proposed revised text is identical to the Fine Print Notes in articles 770, 800, 820 and 830, which are correct. Thus, revising this Fine Print Note will provide further consistency within the NEC.

Panel Meeting Action: Reject

Panel Statement: The panel is acting on this and other proposals related to wire and cable in plenum and other air handling spaces based on NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

"So as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A."

This action does not constitute agreement or disagreement with any of the submittals submitted for the affected proposal.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-135 Log #1569 NEC-P03 Final Action: Accept (725.82(G))

Submitter: Harold C. Ohde, BIEW-NECA Technical Institute

Comment on Proposal No: 3-195

Recommendation: Continue to reject.

Substantiation: I commend CMP 3 rejecting this proposal. The submitter’s recommendation to add a new cable designation (concealed space cable) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The FPN No. 2 would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible, conduit or a sprinkler system to be installed in the concealed space of plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces” therefore making it impossible to enforce. What constitutes a concealed space? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows: 8.14.1.2 Concealed spaces not Requiring Sprinkler Protection. 8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. A 8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc...can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1) For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined. In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the recommendation but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-137 Log #1467 NEC-P03 Final Action: Reject (725.154, 725.179, 760.154, and 760.179)


Comment on Proposal No: 3-171

Recommendation: Reconsider and accept the proposals. The section numbers (8.154 & xxx.179) are from the Panel’s renumbering in Proposals 3-138 & 3-211.

3-138 Log #1453 NEC-P03 Final Action: Reject (725.154(1))

Panels Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-138.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Substantiation: The Panel erred in applying the Council’s directive on NFPA 90A, related to materials exposed to airflow in an air distribution system. The cables in each of the proposals did not have an “R” or “P” as the last letter in the type designation, so would not be permitted to be installed in a riser or air distribution systems (air ducts and plenums). The cables would only be permitted as other wiring within buildings.

Recommendation: Reconsider proposal 3-171 and revise 725.61 as shown below. Note that section 725.61 has been renumbered to 725.154 by panel action. A proposal can be found above a suspended ceiling or under a raised floor, neither of which is a plenum. The proposed cable has a very low fuel load, as compared to other types of cable insulation. Some cable constructions use one type of insulation on the conductor and another type for the jacket.

To better clarify the Standards Council’s decision on NFPA 90A does not include or not included in the NEC.

Substantiation: As pointed out in my affirmative comment, I agreed with the Panel’s suggestion that the proposed text might be more appropriate in another section; and pointed out that application of the Standards Council’s decision on NFPA 90A was an error. The proposed marking on the cable did not include a “P” added to CL2 or CL3. Type CL2P or Type CL3P cables are permitted to be installed in plenums.

This comment creates a new section for the fire hazard cable. The new section provides a requirement that clearly identifies that the fire hazard cable is permitted to be installed as “Other Wiring Within Buildings.”

To better clarify that the Standards Council’s decision on NFPA 90A does not apply and to better clarify where the cable is permitted to be installed, the marking on the cable is changed to Type CL2-FHC and Type CL3-FHC. The “FHC” suffix stands for fire hazard cable. There is a companion comment to revise the marking found in my comment to Proposal 3-193.

Some installations require large amounts of cable. A typical application of a fire hazard cable could be seen in a suspended ceiling or under a raised floor, neither of which is a plenum. The proposed cable has a very low fuel load, as compared to other types of cable insulation. Some cable constructions use one type of insulation on the conductor and another type for the jacket.

The Type CL2-FHC and CL3-FHC cables suggested for listing and marking in 725.179 (comment to proposal 3-193) has parameters (e.g. 3500 BTU/lb) that are standard in the building industry and useful to system designers and fire protection engineers.

To put cable insulation heat release in perspective, here are relative values: Fire Hazard Cable insulation: less than 8 MJ/kg (3,500 BTU/lb) PVC insulation: As high as 25 MJ/kg (11,000 BTU/lb) Polyolefin insulation: As high as 46 MJ/kg (20,000 BTU/lb)

Panel Meeting Action: Reject
Panel Statement: The cables recommended in this comment and associated proposed standards include, for example, a variation of limited combustible cables. Limited combustible cables are available and are marked Type CL2P and can therefore be installed in any location a riser or general cable can be installed. There is no restriction in the Code preventing the use of this cable and there is no specific requirement for its use. Therefore, there is no reason at this time to add the recommendation to 725.61.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative: EGESDAL, S.: Six manufacturers have a listing for a robust cable that UL has identified as a combustible cable. Yet, CMP 3 has denied Articles 725 and Article 760 from including an application, listing, and marking for this robust cable with an Flame Spread Index less than 25, a Smoke Developed Index less than 50, and a Heat of Combustion less than 3500BTU/lb. The only NEC marking for this robust cable is for a combustible cable (e.g. FPLP) in plenums. Proposed to NFPA 262, has a Smoke Developed Index of 500 or greater and an unknown Heat of Combustion.

This comment did not include an application for installation in plenums to comply with the Standards Council’s directive on NFPA 90A.

The panel statement on this comment seems out-of-step with the panel statement to comment 3-172, which follows. “Listing for non-power-limited fire alarm cable is based on UL 1425, Cables for Non-Power-Limited Fire Alarm Circuits, and this listing does not cover Class 1 circuits. A manufacturer could submit a request to the UL Standards Technical Panel (STP) for either a change to the UL standard to permit this application or a separate standard to cover Class 1 cables, but that point then it isn’t a Class 1 cable a standard that would specifically permit this application.”

It seems that the NEC TCC needs to provide guidance to the Code Making Panels on whether the NEC of UL should take the lead on requirements included or not included in the NEC.

3-139 Log #1258 NEC-P03 Final Action: Reject (725.176 (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC
Comment on Proposal No: 3-186
Reconsider proposal 3-186 and accept in principal as shown below. The suggested numbering matches the “parallel” section number for non-power-limited cable in 760.176, as renumbered by Panel action on proposal 3-211.

725.176 Listing and Marking of Class 1 Cables.
Class 1 cables included as wiring within buildings shall be listed in accordance with 725.176(A) and 725.176(B) and as being resistant to the spread of fire in accordance with 725.176(C), through 725.176(D), and shall be marked in accordance with 725.176(F).

(A) Class 1 Conductor Materials. Conductors shall be 18 AWG or larger, solid or stranded copper.

(b) Insulated Conductors. Insulated conductors shall be available for 600 volts. Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.13 or one that is identified for this use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with 725.27.

(C) Type CL1R. Type CL1R riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass ANSI/UL 1666-2002, Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertical in Shelves.

(D) Type CL1. Type CL1 cable shall be listed as being suitable for general purpose use, with the exception of risers, ducts, plenums, and other space used for environmental air, and shall also be listed as being resistant to the spread of fire.

FPN: No. 1: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables, and Flexible Cords.

FPN No. 2: Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2, No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

(E) Circuit Integrity (CI) Cable or Electrical Circuit Protective System. Cables used for survivability of critical circuits shall be listed as circuit integrity (CI) cables. Cables specified in 725.176(C), and (D), and used for circuit integrity shall have the additional classification using the suffix “-CI:” Cables that are part of a listed electrical circuit protective system shall be considered to meet the requirements of survivability.

FPN No. 1: Fire alarm circuit integrity (CI) cable and electrical circuit protective systems may be used for fire alarm circuits to comply with the survivability requirements of NFPA 728-2002, National Fire Alarm.

(c) 9.4.3.6 and 6.9.4.6, that the circuit maintain its electrical function during fire conditions for a defined period of time.

FPN No. 2: One method of defining circuit integrity (CI) cable is by, establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistant Cables.

(F) Class 1 Cable Markings. Multiconductor non-power-limited cables shall be marked in accordance with 725.176(E), Class 1 circuit cables shall be permitted to be marked with a maximum usage voltage rating of 150 volts.

Cables that are listed for circuit integrity shall be identified with the suffix “-CI,” as defined in 725.176(E).

Table 725.176(F) Class 1 Cable Markings

Cable Marking Type
CI1 Class 1 circuit riser cable 725.31(E) and (H)

CI1 Class 1 circuit cable 725.31(F) and (H)

Note: Cables identified in 725.176(C) and (D) and meeting the requirements for circuit integrity shall have the additional classification using the suffix “-CI:” (for example, CL1R-CI, and CL1-CI).

FPN: Cable types are listed in descending order of fire resistance rating.

Substantiation: The Panel Statement indicates that a Listed Class 1 cable does not exist. That’s true. Until Panel provides a listing and marking requirement for a Class 1 cable, it will not exist. The proposed Class 1 cable construction is identical to non-power-limited fire alarm cable, less a listing and marking for plenum cable.

Non-power-limited fire alarm cable is found in 760.81 in the 2005 NEC.

In lieu of the research report requested by the Panel, this type of cable has been installed for fire alarm installations for decades. From conversations with cable manufacturers, it appears that many 10’s of millions of feet of non-power-limited fire alarm cable has been installed. The application of the proposed Class 1 cable and non-power-limited fire alarm cable may be the same for identical devices, but used for different systems.

Non-power-limited cable was introduced in the 1975 edition of the NEC, along with the first appearance Article 760, Fire Alarm Systems. Prior to 1975,
the cable was permitted by NFPA 72-1972 in section 2140, Special Cables for
Circuits Operating at 150 volts or Less. That’s the extent of my library.
Panel Meeting Action: Reject
Panel Statement: See the panel report on Comment 3-122.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-122.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-140 Log #1456 NEC-P03 Final Action: Reject (725.179(G) (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC
Comment on Proposal No: 3-193
Recommendation: Consider proposal 3-193 and revise Section 725.82, as shown below. Note that section 725.82 was renumbered to 725.179 by panel action on proposal 3-138.

Sections 725.179(A), through (F) do not change.

Insert new 760.179(G), renumber existing subsections as follows: “G” to “H”;
“H” to “I”; “I” to “J”; “J” to “K”; “K” to “L”; and “L” to “M”.

(G) Low Fire Hazard (-FHC) Cable. Cables used to reduce potential heat release shall be listed as fire hazard (-FHC) cable and shall have a low potential heat release. Cables specified in 752.154(E)(1), and used to reduce potential heat release shall have an additional classification using the suffix “-FHC”.

FPN No. 1: One method of defining a low potential heat release cable is that the cable exhibits a maximum potential heat value of exceeding 8141 kJ/kg (3500 BTU/lb) when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, as well as a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials.

Substantiation: As pointed out in my negative comment, I stated out that application of the Standards Council’s decision on NFPA 90A was an error. The proposed marking on the cable did not include a “P” added to CL2 or CL3. Type CL2P or Type CL3P cables are permitted to be installed in plenums. To better clarify that the Standards Council’s decision on NFPA does not apply and to better clarify where the cable is permitted to be installed, the marking on the cable is changed to Type CL2-FHC and Type CL3-FHC. The “FHC” suffix stands for fire hazard cable. There is a companion comment to revise the application of fire hazard cable in my comment to Proposal 3-171.

The proposed cable provides listing parameters useful to system designers and fire protection engineers.

The key parameter in the listing requirements is potential heat release. To put cable heat release in perspective, here are relative values:
- Fire Hazard Cable insulation: less than 8 MJ/kg (3,500 BTU/lb)
- PVC insulation: as high as 25 MJ/kg (11,000 BTU/lb)
- Polyolefin insulation: as high as 46 MJ/kg (20,000 BTU/lb)

Polyolefin insulation is sometimes used as insulation on conductors, and is covered by a PVC jacket. Polyolefin insulation provides better electrical properties (dielectric constant) than PVC insulation.

Additionally, flame spread and smoke developed parameters identify the robustness of the cable.

A flame spread index of 25 is found in a number of NFPA publications, for example: NFPA 13-2007 8.15.1 Concealed Spaces.

8.15.1.2.10 Concealed spaces where rigid materials are used and the exposed surface has a flame spread index of 25 or less, and the materials have been demonstrated not to propagate fire when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, extended for an additional 20 minutes in the form in which they are installed, shall not require sprinkler protection.

NFPA 13 use of “concealed spaces” corresponds to a typical dictionary definition: out of sight, hidden. This definition add “spaces” to “concealed” and represents a different meaning from how the NEC defines “concealed.” Where both the NEC and NFPA 13 apply, “concealed” cable can be removed from a “concealed space.” After removal of the cable, the “concealed space” would remain.

A smoke developed index of 50 is more rigorous than the typical smoke developed index of 450 for interior finishes. Interior finishes can be considered a "fixed" application: one sheet or one coat. Cable installations are a "variable" application: one cable or hundreds of cables. It seems reasonable to establish a robust requirement, due to the variable application. Electronic equipment is susceptible to damage from smoke and heat, both components of a fire.

There a number of manufacturers with cable listed to the requirements in the proposed FPN, so these requirements are not a financial hardship.

Panel Meeting Action: Reject
Panel Statement: See the panel statement in Comment 3-138.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:
EGESDAL, S.: See my negative vote on comment 3-138.
In other spaces for environmental air. The exception in question confuses that issue. Nothing in 760.61 contradicts this because the exception does not refer to 760.61. It only refers to 760.30 which in turn covers only non-power limited cables. So compliance with 300.22 is still required under 760.61 and therefore, 760.61 must be interpreted to permit plenum cables only in other spaces for environmental air. (About the only use that would be permitted in a duct or plenum to comply with 300.22(B) would be a line-type fire detector that has to go in the duct for its function, or perhaps some unusual type of detector that is installed in the duct rather than being outside the duct with a sampling tube inserted in the duct.) Furthermore, the Exception to 760.3(B) does not provide any exception to 300.22 as it purports to do because 730.3(B)(1) and (B)(2) also require compliance with 300.22(C) (other spaces for environmental air). The deletion of this exception will not change anything except to remove a reference that apparently, according to the panel statement, is confusing even to the panel.

Panel Meeting Action: Reject
Panel Statement: Section 300.22(B) does not permit nonmetallic wiring in ducts and plenums. Section 760.30(B)(1) and (2) state that NPLFP is not permitted in the plenum or duct, and 760.61(A) says that FPLP is permitted in plenum or duct. Chapter 7 modifies Chapter 3, so the exception is needed.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-145 Log #486 NEC-P03 Final Action: Accept in Part (760.8)

Submitter: Timothy P. McNerney, Thomas & Betts Corporation
Comment on Proposal No: 3-225
Recommendation: Change the panel action to Accept in Principle. Add the additional text suggest in the comment on negative vote by Mr. Easter: “Cable ties that provide primary support for such cables shall have a minimum loop tensile strength of 23 kg (50 lbs).”

Substantiation: “Minimum loop tensile strength” is commonly marked on packages of cable ties. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The panel is also asked to follow the long time position of CMP-7 and not consider in its final decision the requirement that cable ties or other support hardware to be listed.

Panel Meeting Action: Accept in Part
Panel Statement: The panel accepts adding cable ties as a permitted method to support fire alarm cables. The panel rejects the recommendation to add the sentence requiring cable ties to have a minimum tensile strength.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative: EASTER, L.: See NEMA recommendation and my explanation of negative vote on Comment 3-102.

3-146 Log #1809 NEC-P03 Final Action: Accept (760.8)

Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 3-225
Recommendation: This proposal should have been accepted.
Substantiation: The panel statement is unresponsive to the proposal, and considering the other support methods listed, borders on nonsense. If “it is not acceptable to use a cable tie” because “there is no spacing requirement provided for distance between supports,” then none of the other methods (straps, staples, hangers, or similar fittings) should be acceptable either. As noted in the proposal, cable ties are already recognized for numerous other wiring methods that are much heavier than the cables covered by Article 760 and cable ties have been accepted as support methods by Panels 7, 12, and 16, so the rejection of this proposal is highly inconsistent and unjustified. As noted in the Explanations of Negative, cable ties are already permitted in many places under the language “or similar fittings,” but consistency in the code is highly desirable and directly addresses the ongoing issue of usability.

Panel Meeting Action: Accept
Panel Statement: The proposal should be accepted.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative: EGESELDAL, S.: This comment should have been rejected, based on the Standards Council’s decision on NFPA 90A. UL lists cable ties for installation in HVAC system plenums. Rejecting this comment would be consistent with the action taken by Panel 3 on comments 3-134, 3-164, and 3-176, which suggested a trivial editorial change to NFPA 262 listing requirements. The Panel used the NFPA 90A directive to reject these 3 comments.

Additionally, the submitters of comments did not provide technical substantiation to respond to the panel statement on proposal 3-155, as follows. “It is not acceptable to use a cable tie to serve as a sole support for a cable when there is no spacing requirement provided for the distance between supports.” Further, the proposals, comments, and panel statements provide no technical substantiation for panel action that would require all hardware used to support these cables to be listed. Code-making panels 7 and 8 have steadily rejected similar proposals relating to the support of cables and raceways.


3-147 Log #899 NEC-P03 Final Action: Accept (760.8, FPN )

Submitter: John M. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 3-228
Recommendation: The panel is encouraged to accept Proposal 3-228.
Substantiation: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a fine print note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other References.

Panel Meeting Action: Accept
Panel Statement: Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative: EGESELDAL, S.: This comment should be rejected. A few code cycles ago, the FPN to this section referenced 3 documents that were not directly related to fire alarm systems. At that time, CMP 16 had jurisdiction over Article 760. Panel 16 declined to remove the 3 documents until a standard on fire alarm system job practices (not FPN requirements) was available. The NEC/ANSI standard provides information on execution of work that, while generic, is specific to fire alarm systems. The standard has gone through the ANSI process, so has had wide fire alarm industry review.

3-148 Log #1708 NEC-P03 Final Action: Reject (760.9)

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association
Comment on Proposal No: 3-231
Recommendation: The proposal should be Accept in Principle. Revised wording as follows: 760.9. Fire Alarm Circuit and Equipment Grounding. Fire alarm circuits and equipment shall be grounded in accordance with Part II and Part VIII of Article 250.
Substantiation: While the present text is a violation of the NEC Style Manual, it seems reasonable to provide NEC users a clue that grounding rules may or may not apply to Article 760 circuits. Deletion of 760.9 creates a conflict with Table 250.3, which points to 760.9.
Panel Meeting Action: Reject
Panel Statement: Section 250.112(I) already states that fire alarm circuits must comply with Parts II and VIII of Article 250, where the fire alarm systems are required to be grounded, so this text is not necessary in Article 760.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative: EGESELDAL, S.: Fire alarm system installers understand that fire alarm circuits are not grounded. However, it is important to highlight grounding in Article 760 to assure the fire alarm panel is grounded in compliance with Article 250. The main panel reason for deleting the reference to Article 250 is to comply with the NEC Style Manual. The proposed change to this NEC Section provided a reference to Parts of Article 250 in compliance with the NEC Style Manual.

70-491
Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association

Comment on Proposal No: 3-234

Recommendation: Accept the Proposal in Principle and modify 760.10.

760.10 Fire Alarm Circuit Identification. Fire alarm circuits shall be identified at terminal and junction locations in a manner that will help to prevent unintentional energization of other systems.

Substantiation: The Section provides requirements to aid service personnel that are working on systems other than the fire alarm system. Article 760 permits conductors and cables of other systems to be installed with fire alarm conductors and cables. Additionally, the circuit identification is an aid to fire alarm system personnel for effective testing, servicing, or troubleshooting the fire alarm system.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

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Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association

Comment on Proposal No: 3-237

Recommendation: The Proposal should be Accept in Principle. Revise wording as follows:

760.15. Fire Alarm Circuit Requirements. Fire alarm circuits and equipment shall comply with 760.15(A) and 760.15(B).

(A) Non-Power-Limited Fire Alarm (NPLFA) Circuits. See Parts I and II.

(B) Power-Limited Fire Alarm (PLFA) Circuits. See Parts I and III.

FPN to (A) and (B): See NFPA 72, National Fire Alarm Code, for “monitoring for integrity” functionality for Class A and Class B fire alarm circuits and separate out of service of Class A circuit conductors.

Substantiation: Class A fire alarm circuits have physical separation installation requirements. Unless the system designer and installer is alerted, the outbound and return fire alarm circuit conductors may be installed in the same cable or raceway, thereby defeating the purpose of requiring a Class A circuit.

NFPA 72, National Fire Alarm Code, is not directly adopted in many jurisdictions. It is imperative that the NEC “assist” the fire alarm industry by providing guidance on key fire alarm system functionality.

Panel Meeting Action: Reject

Panel Statement: Section 760.1 already has a fine print note that refers the reader to NFPA 72 of 1979 that has this information on the installation and monitoring for integrity requirements in fire alarm systems. Adding a non-mandatory fine print note in this section will not provide enough information to someone doing a fire alarm installation in a jurisdiction that does not adopt the National Fire Alarm Code (NFPA 72). Class A and Class B circuits are not defined in the NEC.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

EGISDALL, S.: NFPA 72, National Fire Alarm Code, has many installation requirements for the installation fire alarm equipment and wiring. The request for a Fine Print Note on Class A and B fire alarm circuits is in response to incorrect installation occurring. The number of fire alarm devices connected to a fire alarm circuit is usually greater than the number connected to a Class B circuit. It is important that installers understand there is a life safety need for physical separation of the outbound and return Class A circuit, so in the event of a break in the circuit, all devices remain connected to the fire alarm panel.

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Comment on Proposal No: 3-238

Recommendation: Accept this Proposal.

Substantiation: The title of Section 725.3 is “Other Articles”. The requirement for the removal of abandoned cables is not in another article; it is in Article 725. It is out of place in section 725.3. This proposal will move it to a new section of Article 725.

FPN to (A) and (B): The current placement of the requirement for the removal of abandoned cables in sections 640.3, 725.3, 760.3, 770.3, 800.3, and 820.3 is an error. The error was made by Panel 16 in processing the 2002 NEC. Panel 16 recognized these errors and corrected them by accepting the movement of these requirements in its actions on Proposals 16-31, 128, 254, 259, and 361.

Moving the removal requirements to sections 725.25 and 760.25 will create parallelism between Articles 725, 760, 770, 800, 820, and 830.

Panel Meeting Action: Accept in Principle

Accept in Principle

Panel Statement: See the panel action and panel statement in Comment 3-111.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

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Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 3-240

Recommendation: This proposal should have been accepted in principle with the following change: Change the added reference to 300.7(A).

Substantiation: The substantiation dealt only with issues of condensation, so the only part of 300.7 that is applicable is the sealing requirement of 300.7(A). The substantiation did not address the issues covered in 300.7(B).

Panel Meeting Action: Reject

Panel Statement: Although the substantiation for the proposal dealt only with the condensation issue, if a conduit is exposed to temperature changes that are extreme enough to cause condensation, the expansion and contraction issue needs to be addressed at the same time.

Number Eligible to Vote: 13

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

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Submitter: Harold C. Ohde, IBEW-NECA Technical Institute

Comment on Proposal No: 3-243

Recommendation: Continue to reject.

Substantiation: The submitter’s recommendation to add this FPN to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”; therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.
In the 2006 NFPA 13 committee's substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

I commend CMP 3 rejecting this proposal. CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain "status quo" on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154 and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC therefore it can and should be deleted.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel's concurrence with the entire substantiation.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-155 Log #1600 NEC-P03 Final Action: Accept (760.30(B)(4), FPN )

Submitter: Harold C. Ohde, BWE-NECA Technical Institute
Comment on Proposal No: 3-244
Recommendation: Continue to reject.
Substantiation: The submitters' recommendation to add this FPN to this section is in grave error. This FPN would not provide guidance to designers, installers, or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1.1. It is important to note that the NEC does not have a definition of "concealed spaces", therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1.1 of NFPA 13 has been revised to read as follows: 8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection. 8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1) 8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials and should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee's substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

I commend CMP 3 rejecting this proposal. CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain "status quo" on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154 and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC therefore it can and should be deleted.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel's concurrence with the entire substantiation.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-156 Log #1703 NEC-P03 Final Action: Reject (760.32(B)(2), 760.32(B)(3), 760.32(B)(4), 760.61(A), 760.61(B)(1), 760.61(C))

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association
Comment on Proposal No: 3-230
Recommendation: The proposal should be accepted in principal. Add new text in six places
Add the following fine print note to Exception No. 3 of three Sections: 760.32(B)(2), 760.32(B)(3) and 760.32(B)(4)
FPN to Exception No. 3: It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Add a fine print note to 760.61(A).
FPN: It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Add a fine print note to immediately following 760.61(B)(1)
FPN to 760.61(B)(1): It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Add a fine print note to 760.61(C)
FPN: It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Substantiation: Circuit integrity cable is listed for installation exposed, installed in metal raceway, or either installation method. Fire alarm circuit integrity cables provide for survivability of notification circuits during a fire emergency. It is critical that circuit integrity cable be installed according to its listing and manufacturer's installation instructions.
Panel Meeting Action: Reject
Panel Statement: Section 110.3(B) already requires listed and labeled equipment to be installed and used in accordance with listing and labeling instructions.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1

3-157 Log #1702 NEC-P03 Final Action: Reject (760.32(B)(2), 760.32(B)(3), 760.32(B)(4), 760.61(A), 760.61(B)(1), 760.61(C))

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association
Comment on Proposal No: 3-214
Recommendation: The proposal should be accepted in principal. Add new text in six places.
Add the following fine print note to Exception No. 3 of three Sections: 760.32(B)(2), 760.32(B)(3) and 760.32(B)(4)
FPN to Exception No. 3: It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Add a fine print note to 760.61(A).
FPN: It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Add a fine print note to immediately following 760.61(B)(1)
FPN to 760.61(B)(1): It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Add a fine print note to 760.61(C)
FPN: It is critical for circuit integrity cable functionality to observe manufacturer's instructions that may require or prohibit installing cable in raceway.
Substantiation: Circuit integrity cable is listed for installation exposed, installed in metal raceway, or either installation method. Fire alarm circuit integrity cables provide for survivability of notification circuits during a fire emergency. It is critical that circuit integrity cable be installed according to its listing and manufacturer's installation instructions.
Panel Meeting Action: Reject
Panel Statement: Section 110.3(B) already requires listed and labeled equipment to be installed and used in accordance with listing and labeling instructions.

70-493
3-158 Log #1811 NEC-P03  
Final Action: Reject  
(760.52(B))

Submitter: Noel Williams, Herriman, UT

Comment on Proposal No: 3-246

Recommendation: This proposal should have been accepted in principle with the following change: Change the added reference to 300.7(B).

Substantiation: The substantiation dealt only with issues of condensation, so the only part of 300.7 that is applicable is the sealing requirement of 300.7(A). The substantiation did not address the issues covered in 300.7(B).

Panel Meeting Action: Reject

Panel Statement: Although the substantiation for the proposal dealt only with the condensation issue, if a conduct is exposed to temperature changes that are extreme enough to cause condensation, the expansion and contraction issue needs to be addressed at the same time.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-159 Log #1940 NEC-P03  
Final Action: Accept in Part  
(760.52(B))

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Comment on Proposal No: 3-246

Recommendation: I agree with this Proposal, however, the reference to Article 300 is shown as inserted under devices instead of cables; in addition, I believe the wording needs to be adjusted to reflect the fact that Electrical Circuit Protective Systems contain compatible sealing materials that have been tested:

-B PLFA Wiring Methods and Materials. Power-limited fire alarm conductors and cables described in 760.82 shall be installed as detailed in 760.52(B)(1), (B)(2), or (B)(3) of this section and 300.7. Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

FPN: See the Electrical Circuit Protective System listing for sealing materials approved for use with Electrical Circuit Protective Systems, in connection with 300.7.

Substantiation: None given.

Panel Meeting Action: Accept in Part

Panel Statement: The information proposed for the fine print note is more appropriately covered under 110.3(B).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-160 Log #1694 NEC-P03  
Final Action: Accept  
(760.61)

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 3-250

Recommendation: Continue to Reject.

Substantiation: I commend CMP 3 for rejecting this proposal. The submitter’s recommendation to create a new cable designation (FPL50) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s substantiation would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenum would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces” therefore making it impossible to enforce. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection
8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.2.)

8.14.1.2.2 Concealed spaces of combustible materials and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: caulking, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustibles. CMP 3 rejected this proposal based on the Standards Council decision D05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-161 Log #367 NEC-P03  
Final Action: Accept  
(760.61 (New 760.154))

Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA

Comment on Proposal No: 3-251

Recommendation: Continue to reject the recommendation in proposal 3-251. Retain the existing 760.61 (renumbered to 760.154 by panel action on proposal 3-138) except for (D) which should be changed as shown and renumber the titles of the Table and Figure:

Renumber Table 760.61 to be Table 760.154(D) and Figure 760.61 to be Figure 760.154(D).

FPN: For information on communications cables (CMP, CMR, CMG and CM) see 800.179.

Substantiation: Section 2.3 of the NEC Style Manual provides for two options for figures, either they are mandatory and can have mandatory language (shall) or they are non-mandatory and are in a fine print note and do not contain mandatory language. This comment will bring the cable substitution figures into compliance with the style manual by making the cable substitution figures part of the mandatory text.

Similar corrections for Articles 725, 770, 800 and 820 are contained in other comments.

This Comment has been prepared by a Task Group established by the Technical Correlating Committee. The Task Group includes R. Owen, M. Ode, S. Owen, J. Brunssen, S. Kaufman, S. Johnson, S. L. Stene and S. D. Kahn.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-162 Log #1601 NEC-P03  
Final Action: Accept  
(760.61(A), FPN)

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute

Comment on Proposal No: 3-253

Recommendation: Continue to reject.

Substantiation: The submitter’s recommendation to add this FPN to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenum would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection
8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see 8.14.1.2.2.)

8.14.1.2.2 Concealed spaces of combustible materials and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: caulking, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would...
not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

I commend CMP 3 rejecting this proposal. CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154 and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24).

This FPN referencing NFPA 13 was added to the 2005 NEC therefore it can and should be deleted.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-163 Log #1696 NEC-P03 Final Action: Accept

Submitter: Harold C. Ohde, IBEW #134
Comment on Proposal No: 3-255
Recommendation: Continue to Reject.
Substantiation: I commend CMP 3 for rejecting this proposal. The submitter’s recommendation to create a new cable designation (FPL50) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s recommendation to add this FPN to this section is in grave error. This FPN would not provide to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirements because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces” therefore making it impossible to enforce. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction.

NFPA 13 just completed their revision process for the 2006 NEC 13 Standard. 8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection. 8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible goods shall require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in this section spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-164 Log #656 NEC-P03 Final Action: Reject

Comment on Proposal No: 3-259
Recommendation: Revise text to read as follows:
760.81 Listing and Marking of NPLFA Cables. Non-power-limited fire alarm cables installed as wiring within buildings shall be listed in accordance with 760.81(A) and 760.81(B) and as being resistant to the spread of fire in accordance with 760.81(C) through 760.81(F), and shall be marked in accordance with 760.81(G). (A) NPLFA Conductor Materials. Conductors shall be 18 AWG or larger solid or stranded copper.
(B) Insulated Conductors. Insulated conductors shall be suitable for 600 volts. Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.13 or one that is identified for this use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with NFPA 72.
(C) Type NPLFP. Type NPLFP non-power-limited fire alarm cable for use in other space used for environmental air shall be listed as being suitable for use in other space used for environmental air as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining a cable that is low smoke-producing cable and fire-resistant cable is that the cable exhibits a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, in establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999.

No change for 760.81(D) through 760.81(G).

Substantiation: This comment recommends a slight change in wording for the existing Fine Print Note, by recognizing that listing of plenum cable by NFPA 262 represents listing to both low smoke and low flame spread, and that cables cannot be listed separately to either property. This is basically an editorial change, as a clarification, to the existing Fine Print Note.

The same change is being proposed to the corresponding Fine Print Notes in article 725 and the other Fine Print Note in article 760. The new language is consistent with the language in the corresponding fine print notes in articles 770, 800, 820 and 830, all of which deal with the same type of cables.

The committee rejected the proposal based on, and I quote: “NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

“[S]o as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.”

However, Standards Council has since issued a new decision, NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. This decision addresses CMP decisions on Fine Print Notes referencing NFPA 13 and it states, in pertinent part, as follows: “if the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 300, 760, 770, 800, 820 and 830).”

I believe that this Standards Council decision, indirectly, applies to the Fine Print Note to which this comment refers, for two reasons:
1. As Tom Guida explains in his negative on this item, “With reference to the Panel Statement, this proposal does not change the “status quo” with regard to plenum cables. The proposal is essentially editorial. The proposed revised FPN actually aligns the wording of the FPN with the existing wording in NFPA 90A for cables in ceiling cavity and raised floor plenums.” In other words, retention of the Fine Print Note in its existing form engenders confusion because it gives the erroneous impression that plenum cables could be listed separately for flame spread and for smoke, and that is incorrect.

2. This Fine Print Note is identical to the ones in 725.82 (A) and in 760.82 (D), both of which are equally incorrect and potentially misleading. On the other hand the proposed revised text is identical to the Fine Print Notes in articles 770, 800, 820, and 830, which are correct. Thus, revising this Fine Print Note will provide further consistency within the NEC.”
Cable Marking. The cable shall be marked in accordance with Table 760.82(I). This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected proposal.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-166 Log #2180 NEC-PE03 Final Action: Rejected (760.81(F) and 760.82(G), FPN 3 (New))

Submitter: James S. Conrad, Tyco Thermal Controls

Recommendation: Reconsider this proposal as Accept in Principle and move to 760.81(F) FPN No. 3 and 760.82(G) FPN No. 3 to read as follows:

FPN No. 3: UL Guide information for electrical circuit protective systems (FHIT) contains information on proper installation requirements to maintain the fire rating of an electrical circuit protective system.

Panel Meeting Action: Reject

Panel Statement: See the panel statement on Comment 3-156.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-166 Log #1715 NEC-PE03 Final Action: Rejected (760.82)

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association

Comment on Proposal No: 3-263

Recommendation: Revise 760.82 as follows:

(C) Ratings. The cables shall have a voltage rating of not less than 300 volts and a temperature rating of not less than 60°C (140°F).

(I) Cable Marking. The cable shall be marked in accordance with Table 760.82(I). The voltage ratings shall not be marked on the cable. Temperature ratings greater than 60°C shall be marked on the cable. Cables that are listed for circuit integrity shall be identified with the suffix CI as defined in 760.82(G).

FPN: Voltage markings on cables may be misinterpreted to suggest that the cable is suitable for Class I, electric light, and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and a voltage marking is required for one or more of the listings.

Substantiation: The proposed changes to 760(C) and (I) provide requirements that match present listing requirements, so will not impose a hardship on cable manufacturers.

Article 760 does not have a temperature rating requirement for cable. The temperature rating on cable is important for some installations. The proposed rating of 60°C (140°F) is used by testing laboratories as the required minimum temperature rating, but the temperature rating is not required to be marked on the cable.

Panel Meeting Action: Reject

Panel Statement: This comment does not add anything new except for marking, which is already covered by the UL product standard. The last sentence of the substantiation states that the proposed temperature rating is used by testing laboratories as the required minimum temperature rating, but since it is already in the standard, adding the temperature rating to 760.82 is unnecessary.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative: EGEDSAL, S.: The NEC should not depend on Underwriters Laboratories to set the required temperature rating and marking on cable use for systems having requirements in Articles 725 and 760. Without a marking on the cable or a requirement in the NEC indicating that no marking means 60°C, the installer may misapply a cable. Misapplication of cable into an environment that is greater than 60°C, such as under a roof deck, may have life safety consequences. Additionally, UL is not the only test lab to list cable. The NEC should set the cable temperature marking requirements.

3-167 Log #657 NEC-PE03 Final Action: Rejected (760.82(D), FPN )


Comment on Proposal No: 3-265

Recommendation: Revise as follows:

760.82 Listing and Marking of PLFA Cables and Insulated Continuous Line- clipping Fire Detectors

Type FPL cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 760.82(A) through 760.82(H) and shall be marked in accordance with 760.82(I). Insulated continuous line-type fire detectors shall be listed in accordance with 760.82(J).

(A) Conductor Materials. Conductors shall be solid or stranded copper.

(B) Conductor Size. The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG.

(C) Ratings. The cable shall have a voltage rating of not less than 300 volts.

(D) Type EPLP. Type EPLP fire alarm plenum cable shall be labeled as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining a cable that is low smoke-producing cable and fire-resistant cable is that the cable exhibits a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame-spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to establish an acceptable value and in established products are produced in accordance with NFPA 262-1980, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) of unburned cable in flue air without the presence of a flame test.

No change for 760.82(E) through 760.82(J).

Substantiation: This comment recommends a slight change in wording for the existing Fine Print Note, by recognizing that listing of plenum cable by NFPA 262 represents listing to both low smoke and low flame spread, and that cables cannot be listed separately to either property. This is basically an editorial change, as a clarification, to the existing Fine Print Note.

The same change is being proposed to the correspondingFine Print Notes in articles 725 and the other Fine Print Note in article 760. The new language is consistent with the language in the corresponding fine print notes in articles 725, 770, 800, 820 and 830, all of which deal with the same type of cables.

The committee rejected the proposal based on, and I quote: “NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows: ‘[5]o as to not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in both NFPA standards. The Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.’”

However, Standards Council has since issued a new decision, NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. This decision addresses CMP decisions in Fine Print Notes referencing NFPA 13 and it states, in pertinent part, as follows: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).”

I believe that this Standards Council decision, indirectly, applies to the Fine Print Note to which this comment refers, for two reasons:

1. As Tom Guida explains in his negative on the companion proposal to this item, “With reference to the Panel Statement, this proposal does not change the ‘status quo’ with regard to plenum cables. The proposal is essentially editorial. The proposed revised FPN actually aligns the wording of the FPN with the Fine Print Notes in NFPA 90A for cables in ceiling cavity and raised floor plenums.” In other words, retention of the Fine Print Note in its existing form engenders confusion because it gives the erroneous impression that plenum cables could be listed separately for flame spread and for smoke, and that is incorrect.

2. This Fine Print Note is identical to the ones in 725.82(A) and in 760.81(C), both of which are equally incorrect and potentially misleading. On the other hand the proposed revised text is identical to the Fine Print Notes in articles 770, 800, 820 and 830, which are correct. Thus, revising this Fine Print Note will provide further consistency within the NEC.
Panel Meeting Action: Reject
Panel Statement: The panel is acting on this and other proposals related to wire and cable in plenum and other air handling spaces based on NFPA Standards Council Decision 05-24 (SC 905-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

“So as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.”

This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected proposal.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-168 Log #1570 NEC-P03

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Recommendation: Continue to reject.
Substantiation: A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers. For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1.)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers. For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-169 Log #1571 NEC-P03

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 3-267
Recommendation: Continue to reject.
Substantiation: I commend CMP 3 rejecting this proposal. The submitter’s recommendation to create a new cable designation (concealed space cable) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s substantiation would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. CMP 3 panel statement also reflects that the definition for “concealed” in Article 100 does not apply to the proposed text. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1.)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1.) For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-170 Log #1572 NEC-P03

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 3-268
Recommendation: Continue to reject.
Substantiation: I commend CMP 3 rejecting this proposal. The submitter’s recommendation to create a new cable designation (concealed space cable) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s substantiation would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. CMP 3 panel statement also reflects that the definition for “concealed” in Article 100 does not apply to the proposed text. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?
A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cable, nonmetallic plumbing piping, non-structural wood, etc. can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

**Panel Meeting Action:** Accept

**Panel Statement:** The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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3-172 Log #1678 NEC-P03

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

**Panel Meeting Action:** Accept

**Panel Statement:** The panel accepts the recommendation, but this action does not indicate the panel’s concurrence with the entire substantiation.

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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3-173 Log #1458 NEC-P03

In 2007, NFPA 13 just completed their revision process for the 2006 NEC. CMP 3 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

**Panel Meeting Action:** Reject

**Panel Statement:** These proposals involve a variation of limited combustible cables. Limited combustible cables are available and are marked Type FPLP and can therefore be installed in any location that a riser or general cable can be installed. The definition for “concealed” in Article 100 in the 2005 NEC does not apply to the proposed text. The reference to NFPA 13 in the substantiation does not seem appropriate at this time, since putting a sprinkler head in an inaccessible location inside the wall or above a drywall ceiling would not permit access for servicing. The area above a suspended ceiling is not considered by the NEC to be a concealed space.

**Number Eligible to Vote:** 13

**Ballot Results:** Affirmative: 13

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To better clarify that the Standards Council’s decision on NFPA does not apply and to better clarify where the cable is permitted to be installed, the marking on the cable is changed to Type FPL-FHC. The “FHC” suffix stands for fire hazard cable. There is a companion comment to revise the marking found in my comment to Proposal 3-269.

Some installations require large amounts of cable. A typical application of a fire hazard cable would be above a suspended ceiling or under a raised floor, neither of which is a plenum. The proposed cable has a very low fuel load, as compared to other types of cable insulation. Some cable constructions use one type of cable insulation as a conductor and another type for the jacket.

The Type FPLP-FHC cable suggested for listing and marking in 760.179 (comment to proposal 3-269) has parameters (e.g. 3500 BTU/lb) that are standard in the building industry and useful to system designers and fire protection engineers.

To put cable insulation heat release in perspective, here are relative values:

- PVC insulation: As high as 25 MJ/kg (11,000 BTU/lb)
- Polyolefin insulation: As high as 46 MJ/kg (20,000 BTU/lb)

Panel Meeting Action: Reject
Panel Statement: The cables recommended in this comment and associated proposal involve a variation of limited combustible cables. Limited combustible cables are available and are marked Type FPLP and can therefore be installed in any location that a riser or general cable can be installed. There is no restriction in the Code preventing the use of this cable and there is no specific requirement for its use. Therefore there is no reason at this time to add the recommended text to 760.61.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
EGESDAL, S.: Six manufacturers have a listing for a robust cable that UL has identified as a limited combustible cable. Yet, CMP 3 has denied Articles 725 and Article 760 from including an application, listing, and marking for this robust cable with an Flame Spread Index less than 25, a Smoke Developed Index less than 50, and a Heat of Combustion less than 3500 BTU/lb. The only NEC marking for this robust cable is for a combustible plenum cable (e.g. FPLP). A plenum cable, tested to NFPA 262, has a Smoke Developed Index of 500 or greater and an unknown Heat of Combustion.

This comment did not include an application for installation in plenums to comply with the Standards Council’s directive on NFPA 90A. The panel statement on this comment seems out-of-step with the panel statement to comment 3-122, which follows. “Listing for non-power-limited fire alarm cable is based on UL 1425, Cables for Non-Power-Limited Fire Alarm Circuits, and this listing does not cover Class 1 circuits. A manufacturer could submit a request to the UL Standards Technical Panel (STP) for either a change to the UL standard to permit this application or a separate standard to cover Class 1 cables, but at this point there isn’t a Class 1 cable that would specifically permit this application.”

It seems that the NEC TCC needs to provide guidance to the Code Making Panels on whether the NEC of UL should take the lead on requirements included or not included in the NEC.

3-174 Log #1459 NEC-P03
(760.179(H) (New))

Submitter: Sanford Egesdal, Egesdal Associates PLLC
Comment on Proposal No: 3-269
Recommendation: Reconsider proposal 3-269 and revise as shown below. Note that 760.82 was renumbered to 760.179 by panel action on proposal 3-211.

Sections 760.179(A), through (G) do not change.
Insert new 760.179(H), renumbering existing subsections as follows: “H” to “I”; and “I” to “J,” and renumber “Table 760.179(I) Cable Markings” to “Table 760.179(J) Cable Markings”.

(H) Power-Limited Fire Hazard (-FHC) Cable. Cables used to reduce potential heat release shall be listed as fire hazard (-FHC) cable and shall have a low potential heat release fire hazard cables specified in 760.158(C), and used to reduce potential heat release shall have an additional classification using the suffix “-FHC”.

FPN No. 1: One method of defining a low potential heat release cable is that the cable exhibits a maximum potential heat value of exceeding 8141 kJ/kg (3500 BTU/lb) when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials as well as a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials.

Substantiation: As pointed out in my negative comment, I stated out that application of the Standards Council’s decision on NFPA 90A was an error. The proposed marking on the cable did not include a “P” added to FPL. Type FPLP cable is permitted to be installed in plenums.

To better clarify that the Standards Council’s decision on NFPA 90A does not apply and to better clarify where the cable is permitted to be installed, the marking on the cable is changed to Type FPL-FHC. The “FHC” suffix stands for fire hazard cable. There is a companion comment to revise the application of fire hazard cable in my comment to Proposal 3-250.

The proposed cable provides listing parameters useful to system designers and fire protection engineers.

The key parameter in the listing requirements is potential heat release.

To put cable heat release in perspective, here are relative values:

- Fire Hazard Cable insulation: less than 8 MJ/kg (3,500 BTU/lb)
- Polyolefin insulation: As high as 46 MJ/kg (20,000 BTU/lb)

Polyolefin insulation is sometimes used as insulation on conductors, and is covered by a PVC jacket. Polyolefin insulation provides better electrical properties (dielectric constant) than PVC insulation.

Additionally, flame spread and smoke developed parameters identify the robustness of the cable.

A flame spread index of 25 is found in a number of NFPA publications, for example: NFPA 13-2007 8.15.1 Concealed Spaces.

8.15.1.2.10 Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less, and the materials have been demonstrated not to propagate fire when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, and the heat and smoke generated for an additional 20 minutes in the form in which they are installed, shall not require sprinkler protection.

NFPA 13 use of “concealed spaces” corresponds to a typical dictionary definition: out of sight, hidden. This definition add “spaces” to “concealed” and represents a different meaning from how the NEC defines “concealed.” Where both the NEC and NFPA 13 apply, “concealed” cable can be removed from a “concealed space.” After removal of the cable, the “concealed space” would remain.

A smoke developed index of 50 is more rigorous than the typical smoke developed index of 450 for interior finishes. Interior finishes can be considered a “fixed” application: one sheet or one coat. Cable installations are a “variable” application: one cable or hundreds of cables. It seems reasonable to establish a robust requirement, due to the variable application. Electronic equipment is susceptible to damage from smoke and heat, both components of a fire.

There a number of manufacturers with cable listed to the requirements in the proposed FPN, so these requirements are not a financial hardship.

Panel Meeting Action: Reject
Panel Statement: See the panel statement on Comment 3-173.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
EGESDAL, S.: See my negative vote on comment 3-173.
ARTICLE 770 — OPTICAL FIBER CABLES AND RACEWAYS

16-2 Log #1530 NEC-P16 Final Action: Reject (770)

Comment on Proposal No: 16-3
Recommendation: Accept this proposal.

Panel Meeting Action: Accept
Panel Statement: The panel reaffirms its intent to reject. It is more appropriate for Article 770 to remain in Chapter 7. Optical fiber cable is also used for applications other than communications (e.g. control).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:
BRUNSSEN, J.: This comment should have been accepted, as should the original Proposal 16-3. The preponderance of optical fiber cable applications is in communications, hence Article 770 belongs in Chapter 8, Communications Systems. For further substantiation see my explanation of negative on Proposal 16-3 and the substantiation accompanying my Comment 16-2.

JOHNSON, S.: I support the commentor’s recommendation to relocate Article 770 to Chapter 7 to facilitate usability of the NEC and have no impact on existing requirements.

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its intent to reject. It is more appropriate for Article 770 to remain in Chapter 7. Optical fiber cable is also used for applications other than communications (e.g. control).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:
BRUNSSEN, J.: This comment should have been accepted, as should the original Proposal 16-3. See my explanation of negative vote for Comment 16-2.

JOHNSON, S.: See my explanation of negative vote on Comment 16-2.

16-3 Log #153 NEC-P16 Final Action: Accept (770, 800, 810, 820 and 830)

Comment on Proposal No: 16-4
Recommendation: Accept this proposal.

Panel Meeting Action: Accept
Panel Statement: The panel reaffirms its intent to reject. It is more appropriate for Article 770 to remain in Chapter 7. Optical fiber cable is also used for applications other than communications (e.g. control).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-4 Log #237 NEC-P16 Final Action: Accept (770.2)

Comment on Proposal No: 16-4a
Recommendation: Accept this proposal.

Panel Meeting Action: Accept
Panel Statement: The panel reaffirms its intent to reject. It is more appropriate for Article 770 to remain in Chapter 7. Optical fiber cable is also used for applications other than communications (e.g. control).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-4b Log #CC1600 NEC-P16 Final Action: Accept (770.2)

Comment on Proposal No: 16-5
Recommendation: Accept this proposal.

Panel Meeting Action: Accept
Panel Statement: The panel reaffirms its intent to reject. It is more appropriate for Article 770 to remain in Chapter 7. Optical fiber cable is also used for applications other than communications (e.g. control).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

The panel has concluded that the added reference to Article 100 is appropriate. Telecommunications constitutes a large portion of optical fiber applications, installed by technicians familiar with Chapter 8 and its independent status. Hence, a reminder to consider the definitions of Article 100 is most helpful and appropriate for these individuals.

While Style Manual conflict is acknowledged, other justifications may warrant the repetitiveness. The application of these references is required for individuals who may not be familiar with other areas of the Code. The Style Manual encourages uniformity of parallel articles.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-6 Log #1104 NEC-P16 Final Action: Reject (770.2)
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-4
Recommendation: The Panel Action should continue to be Accept in Principle with the following additional text deletion.

In 770.2, delete the last phrase “connected by a grounding conductor to an electrode in accordance with 800.100(B).”

Substantiation: The deletion of the phrase is required to comply with 2.2.2 of the NEC Style Manual which states “Definitions shall not contain requirements or recommendations.” and 2.3.2.2 of the Manual of Style for NFPA Technical Committee Documents which states “Definitions shall not contain requirements.”

Panel Meeting Action: Reject
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-7 Log #1105 NEC-P16 Final Action: Reject (770.2)
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-4a
Recommendation: The Panel Action should continue to be Accept in Principle with the following additional text deletion in the Panel Action.

In 770.2, delete the last phrase “connected by a grounding conductor to an electrode in accordance with 800.100(B).”

Substantiation: The deletion of the phrase is required to comply with 2.2.2 of the NEC Style Manual which states “Definitions shall not contain requirements or recommendations.” and 2.3.2.2 of the Manual of Style for NFPA Technical Committee Documents which states “Definitions shall not contain requirements.”

Panel Meeting Action: Reject
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-8 Log #1106 NEC-P16 Final Action: Reject (770.2)
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-5
Recommendation: The Panel Action should be to Accept in Part by revising the Proposal as follows:

770.2 Definitions. See Article 100. For purposes of this article, the following additional definitions apply.

Substantiation: I agree with the Explanation of Negative by H. Ohde. In accordance with 90.3, Article 100 already applies and there is no need for this additional text reference.

The panel might want to Reject the Proposal completely in accordance with 2.2.2.2 and the accompanying examples in the NEC Style Manual.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-5.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-9 Log #1284 NEC-P16 Final Action: Reject (770.2)
Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-4a
Recommendation: The Proposal should be Rejected.

Substantiation: I agree with the Explanation of Negative by H. Ohde.

Also, while the panel provided a panel statement explaining the addition of the phrase “connected by a grounding conductor”, no substantiation or reason was provided for the addition of the two FPNs.

The FPNs should not be included since the user should be knowledgeable enough in the Code and electrical materials to know what Intermediate Metal Conduit (Type IMC) and Rigid Metal Conduit (RMC) are, or, if not, know enough to go to the specific articles on these raceways for additional information.

Panel Meeting Action: Reject
Panel Statement: See Comment 16-4a (Log #CC1600).
See panel action and statement on Comments 16-86, 16-87, 16-201, 16-202, 16-205, 16-284, and 16-285.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-10 Log #1576 NEC-P16 Final Action: Accept (770.2)
Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-9
Recommendation: Continue to reject.
Substantiation: The term “air duct” is not used in Article 770 and, therefore, it does not need to be defined in 770.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

I do believe that expansion of, or, a new definition of, air duct in another Article would be a violation of Standards Council Decision D#05-24. Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Accept
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-11 Log #1577 NEC-P16 Final Action: Accept (770.2)
Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-10
Recommendation: Continue to reject.
Substantiation: The term “air duct” is not used in Article 770 and, therefore, it does not need to be defined in 770.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

I do believe that expansion of, or, a new definition of, air duct in another Article would be a violation of Standards Council Decision D#05-24. Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Accept
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-12 Log #1578 NEC-P16 Final Action: Accept (770.2)
Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-11
Recommendation: Continue to reject.
Substantiation: The term “air duct” is not used in Article 770 and, therefore, it does not need to be defined in 770.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.
I do believe that expansion of, or a new definition of, air duct in another Article would be a violation of Standards Council Decision D/05-24. Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Accept

Panel Statement: There was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-13 Log #1686 NEC-P16 Final Action: Accept (770.2)

Submitter: Harold C. Ohde, IBEW #134
Comment on Proposal No: 16-13
Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to add this definition to 770.2 because the term “concealed space” is used in 770.154(A) FPN is misleading. This definition does not belong in the NEC. The 770.154(A) FPN provided no guidance to designers, installers or code officials. This FPN has misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirements because of NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, the confusion and making it impossible to enforce. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces Not Requiring Sprinkler Protection: 8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A 8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, nonstructural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

Standards Council recently issued another decision (D/06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154 and 820.154 (all under CMP 16 parview) and this deletion will not be in conflict with the Standards Council decision (D/05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC, therefore, it can and should be deleted. There is no need for the term “concealed spaces” to be defined.

Panel Meeting Action: Accept

Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-14 Log #155 NEC-P16 Final Action: Accept (770.2-Abandoned Fiber Optical Cables)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-6
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

The panel accepts the portion of the comments dealing with “Abandoned Optical Fiber Cable” and notes that the term is correct in the preprint. The panel rejects the portion of the comments concerning the fine print note. Equipment is not covered by Article 770; hence the reader must go to Article 100. Usability is enhanced by directing the reader to the definition in Article 100.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:
JENSEN, R.: We agree with the Panel action as to the portion of the comments dealing with “Abandoned Optical Fiber Cable” and notes that the term is correct in the preprint.

However we disagree with including a FPN that duplicates identical normative text that is just a couple of lines above this definition.

CMP 16 accepted proposal 16-5 which will harmonize 770-2, 800-2, 820-2, and 830-2 by including a normative reference to “See Article 100”. Adding a FPN to again “See Article 100” is redundant, especially since this FPN will be two lines down from the identical wording in normative text. Additionally, the 2003 NEC Style Guide specifically states to avoid redundant use of references.

16-15 Log #156 NEC-P16 Final Action: Accept (770.2.Optical Fiber Raceway)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-20
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment. It is the intention of Fine Print Notes to provide explanatory information and they are not intended as a vehicle to provide unnecessary cross-references.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

Usability is enhanced by directing the reader to the definition in Article 100.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-16 Log #157 NEC-P16 Final Action: Accept (770.2.Point of Entrance)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-21
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action with respect to the panel action on Proposal 16-4a.

In addition, it was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. It is the intention of Fine Print Notes to provide explanatory information and they are not intended as a vehicle to provide unnecessary cross-references.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Delete the FPNs in 770.2.

Revise 770.2 as follows:

Point of Entrance. The point within a building at which the cable emerges from an external wall, from a concrete floor slab, or from a rigid metal conduit (Type RMC) or an intermediate metal conduit (Type IMC) connected by a grounding conductor to an electrode in accordance with 770.100(B).

Panel Statement: The panel accepts the direction of the TCC to clarify the panel action.

The panel deleted the FPNs and updated the definition of Point of Entrance. This satisfies the comments expressed in the voting.

The panel correlated the text with Proposal 16-25.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
16-17 Log #1282 NEC-P16  Final Action: Accept in Part

(770.2, 800.93, and 820.93)

Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-4
Recommendation: The panel action should be to Accept in Principle and consideration should be given to the Comment on Affirmative vote by J. Brunssen.
In 770.2, delete FPN No. 1 and No. 2.
In 800.93, delete the FPN.
In 820.93, delete FPN No. 1 and revise “FPN No. 2” to read “FPN”.
Substantiation: The Affirmative comment by J. Brunssen contains numerous valid revisions that should be made.
The FPNs should be deleted since the user should be knowledgeable enough in the Code and electrical materials to know what Intermediate Metal Conduit (Type IMC) and Rigid Metal Conduit (RMC) are, or, if not, know enough to go to the specific articles on these raceways for additional information.
The FPNs in 800.93 and 820.93 should be deleted since the definition of Point of Entrance is included in the definition section of each article and it should not be necessary to add FPNs throughout the article referring the user back to the definition.
Panel Meeting Action: Accept in Part
Panel Statement: The panel accepts the portion of the comment to consider the affirmative comment by J. Brunssen. See panel action and statement on Comment 16-3.
The panel accepts the portion of the comment that the panel action should be “accept in principle”.
See panel action and statement on Comment 16-3.
The panel accepts the deletion of 770.2, FPN No. 1 and No. 2. See Comment 16-4a (Log #CC1600).
The panel rejects the portion of the comment to delete the fine print note associated with the “point of entrance” in 800.93, as it is existing text and its removal would constitute new material.
The panel rejects deletion of FPN No. 1 in 820.93. See panel action and statement on Comment 16-224
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-18 Log #158 NEC-P16  Final Action: Accept

(770.3, 770.133(C) and 770.100 (new))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-25
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the use of the word “and” in the sentence “The grounding conductor shall be connected in accordance with 770.100(B)(1), (B)(2), and (B)(3).”
It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 5-20. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Revise 770.100(B) as follows:
“...the grounding conductor shall be connected in accordance with 770.100(B)(1), (B)(2), and (B)(3).”
Revise 770.100(B)(1) as follows:
“(1) In Buildings or Structures with an Inter-system Bonding Termination.
If the building or structure served has an inter-system bonding termination, the grounding conductor shall be connected to the inter-system bonding termination.”
Revise 770.100(B)(2) as follows:
“(2) In Buildings or Structures with Grounding Means. If the building or structure served has no inter-system bonding termination, the grounding conductor shall be connected to the nearest accessible location on the following.”
Revise 770.100(B)(3) as follows:
“(3) In Buildings or Structures Without Inter-system Bonding Termination or Grounding Means. If the building or structure served has no inter-system bonding termination or grounding means, as described in 770.100(B)(2), the grounding conductor shall be connected to either of the following:”
Panel Statement: The panel accepts the direction of the TCC to review clarification of the panel action.
The panel has clarified the panel action on Proposal 16-25 with respect to the word “and” as indicated in the panel action on this comment. It is not the intent to accomplish the grounding connections of 770.100 (B)(1), (B)(2), and (B)(3) simultaneously. The panel has reconsidered Proposal 16-25 in light of the panel action on Proposal 5-20 as directed by the TCC and revised “inter-system grounding termination” to “inter-system bonding termination” as indicated in the panel action on this comment.

16-19 Log #1225 NEC-P16  Final Action: Accept

(770.3(A))

Submitter: John Burke, Fusion Cable Systems
Comment on Proposal No: 16-26
Recommendation: Continue to Reject this Proposal.
Substantiation: We remove old and unused cable as part of our standard business practice especially in retrofit jobs. The amount of old cable on some jobs has caused damage to the building and created unsafe working conditions for our techs. We support continuing the abandoned cable removal requirement in the Code.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-20 Log #159 NEC-P16  Final Action: Accept

(770.3(A), 770.25 (new) & 770.26 (new))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-29
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with the Panel Action in Proposal 16-25 since there was accepted text for 770.3(A) in Proposal 16-25 and this Proposal 16-29 deletes 770.3(A). This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to review clarification of the panel action.
The panel accepted the proposed revisions to the introductory text of 770.3 in Proposal 16-25 and deleted 770.3(A) in Proposal 16-29. Section 770.3(A) was deleted, since 770.3, Other Articles, is not the appropriate location for material on “spread of fire or products of combustion”. The panel, in keeping with the editorial task group recommendations, relocated and expanded this material in 770.26 which correlates with similar changes in Articles 800, 820, and 830. Proposal 16-36 adds a new 770.3(A) concerning composite optical fiber cables.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-21 Log #160 NEC-P16  Final Action: Accept

(770.3(A), 770.25 (new) and 770.26 (new))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-31
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal and that further consideration be given to the comments expressed in the affirmative voting. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.
The panel accepts the direction of the TCC to clarify the panel action.
See panel action and statement on Comments 16-22 and 16-23.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-22 Log #1436 NEC-P16  Final Action: Accept

(770.3(A), 770.25 and 770.26)

Comment on Proposal No: 16-31
Recommendation: Accept this proposal in principle by continuing to accept the panel actions and restore the fine print note that the submitter proposed and the panel inadvertently omitted in its actions.
Substantiation: SPI supports the work of the CMP-16 Special Editorial Task Group to produce a more user-friendly code. We agree that the requirements for the removal of abandoned cable do not belong in “Other Locations”. We also agree that the firestop requirements should be in the article and not referenced
back to Chapter 3. This is especially important for optical fiber installations since they are not electrical. The low-voltage and no-voltage installers of communications and optical fiber cables should not have to interpret the applicability of the electrical requirements of Chapter 3 to their installations. The fine print note needs to be restored to correct an error. Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Panel Meeting Action: Reject
Panel Statement: The panel rejected the text that the submitter of the comment objected to.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Submitter: Harold C. Ohde, IBEW #134
Comment on Proposal No: 16-30
Recommendation: This Proposal should have been Rejected.
Substantiation: The submitter’s recommendation to add a new 770.26 with this FPN No. 2 to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13. Section 8.14.1. 770.26 also has a term “concealed spaces” and it is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2* Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible material but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 16 should have rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154, and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

16-26 Log #1286 NEC-P16 Final Action: Hold
(770.12 and 770.110 (New))

TCC Action: The Technical Correlating Committee understands that the panel action was to “Hold” the comment only.
Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-38
Recommendation: The panel action on the Proposal should continue to be Accept in Principle, however, the following additional changes should be made to the panel action:
Revise 770.12 as shown:

770.12 Installed for Optical Fiber Cable Installed in Raceways. Listed plenum optical fiber raceways for Listed optical fiber raceways for listed general purpose optical fiber raceways are selected in accordance with the provisions of 770.154 shall be permitted to be installed in any type of listed raceway permitted in Chapter 3.

Revise the new 770.110 as follows:

770.110 Raceways for Optical Fiber Cables. Where optical fiber cables are installed in a raceway, the raceway shall be either of a type unpermitted in Chapter 3 and installed in accordance with Chapter 3 or a listed plenum optical...
The maximum percentage fill requirements in Chapters 3 and 9 are an applicable to electrical nonmetallic tubing apply. Where optical fiber raceways (plenum, riser, or general-purpose) in any type of listed raceway permitted in Chapter 3 without adding an undefined term to the Code. Consequently, the proposal should have been subjected to the direction given by the Standards Council, as were many other proposals which require the direction of the Code-making Committee Projects.

Affirmative: 15

Final Action: Reject

362.22 through 362.56. All metal or nonmetallic devices used for positioning - which may include bundling and securing - or to a limited extent supporting cable, wire, conduit, or tubing of a wiring system in electrical installations, to reduce the risk of fire, electric shock, or injury to persons.

Devices are evaluated for properties that we are concerned about. It is NOT a requirement for a listed device to be evaluated for use in air handling spaces. It no way implies that devices in the category are suitable for use in air handling areas…"

The reference to air handling spaces is only a reference and is stated as: “…for those devices which have been investigated to determine their suitability for use in air handling areas…”

This is a standard statement that is found in a wide variety of listing categories including the category for IT and Telecom equipment to cover situations where a special investigation is done to evaluate a device for air handling spaces. It no way implies that the devices in the category are automatically intended for air handling spaces.

Device for air handling spaces. Consequently, the proposal should have been subjected to the direction given by the Standards Council, as were many other proposals which were rejected.

As Mr. Dorna noted in his “Explanation of Negative Vote”, “The UL Directory (2005), shows that category ZODZ covers “cable ties, cable tie mounts and similar types of related hardware”. Likewise, Conduit and Fittings, category DWVF covers “cable ties, conduit straps, staples and similar hardware...” Both categories list as “Suitable for use in air handling spaces in accordance with Sec 300.22(C) and (D) of the National Electrical Code.”

The proposal portion that introduces “listed” should have been rejected because of the Standards Council directive concerning NFPA 90A. Code Making Panels must be consistent in their handling of all submitted proposals. The guide information for ZODZ, Wire Positioning Devices states that: “The investigation of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance and weatherability characteristics as appropriate for the product.”

These are all characteristics that we should be concerned about for electrical installations.

number Eligible to Vote: 15

Substantiation:

This is a standard statement that is found in a wide variety of listing categories including the category for IT and Telecom equipment to cover situations where a special investigation is done to evaluate a device for air handling spaces. It no way implies that the devices in the category are automatically intended for air handling spaces.

Devices are evaluated for properties that we are concerned about. It is NOT a requirement for a listed device to be evaluated for use in air handling spaces.

Number Eligible to Vote: 15
Tests for mounting blocks and other mounting hardware and devices and very often secondary support or wire management functions. All hardware need not be held to the highest standard.

The comment provided by Mr. Dorna with his negative vote references two UL categories under which cable ties and other hardware are “listed.” The correct UL category for Hardware for Support of Conduit, Tubing and Cable (UL 2239) is DWMU, not DWFY. Nevertheless, this standard and UL 1565, Positioning Devices (ZODZ) establishes a 23 kg test load for all support products for flexible conduits and cables in accordance with the requirements for primary support throughout the NEC. For cable ties, “minimum loop tensile strength” is commonly marked on packages. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The proposed new text will add value to inspectors in acceptance of appropriate cable ties without requiring lists.

Comment on Proposal No: 16-44
Recommendation: Accept this proposal.
Substantiation: This proposal should be accepted. The requirement added by Panel 16 during the 2005 revision cycle is overly restrictive and inappropriate for optical fiber cables. The Fine Print Note associated with 770.24 directs the reader to the appropriate installation standards. The Panel has enhanced the Fine Print Note during this cycle by the addition of a reference to ANSI/NECA/FOA 301-2004 covering the installation of optical fiber cables (see Proposal 16-46). These references are all that is necessary and sufficient for such cables without imposing the burdensome requirements of 300.11. Section 300.11 is directed toward power cable assemblies that are heavier and 70-506

16-31 Log #1529 NEC-P16 Final Action: Reject

Submitter: Timothy P. McNeive, Thomas & Betts Corporation
Comment on Proposal No: 16-48
Recommendation: Accept this proposal.
Substantiation: This proposal should be accepted. The requirement added by Panel 16 during the 2005 revision cycle is overly restrictive and inappropriate for optical fiber cables. The Fine Print Note associated with 770.24 directs the reader to the appropriate installation standards. The Panel has enhanced the Fine Print Note during this cycle by the addition of a reference to ANSI/NECA/FOA 301-2004 covering the installation of optical fiber cables (see Proposal 16-46). These references are all that is necessary and sufficient for such cables without imposing the burdensome requirements of 300.11. Section 300.11 is directed toward power cable assemblies that are heavier and 70-506
Comment on Proposal No: 16-48

Final Action: Reject

Panel Meeting Action: Reject
Panel Statement: Securing an additional cable to an existing cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
BRUNSSEN, J.: This comment should have been accepted as should the original Proposal 16-44. The securing and supporting requirements of 300.11 are overly restrictive and inappropriate for optical fiber cable. Section 300.11 is directed toward power cables that are physically larger and operate at substantially greater voltage, current and power levels. For further substantiation, see my explanation of negative on Proposal 16-44 and the substantiation accompanying my Comment 16-31.

JONES, R.: I support the submitter’s arguments. These are lightweight cables and pose no significant safety risk.

JONES, R.: There is no need to incorporate the requirements of 300.11. The installation requirements of Article 770 are adequate. In addition, the Panel has enhanced the Fine Print Note during this cycle by the addition of a reference to ANSI/NEC/FOIA 301-2004 covering the installation of optical fiber cables. Section 300.11 is directed toward power cable assemblies that are heavier and larger than optical fiber cables. Optical fiber cables contain no power. (Where composite optical fiber cables are used, they are classified as electrical cables in accordance with the type of electrical conductors.)

16-32 Log #1532 NEC-P16
(770.24)


Comment on Proposal No: 16-48
Recommendation: Accept this proposal.

Substantiation: This proposal should be accepted. If the Panel continues to support the addition of the requirements of 300.11 to 770.24, then at the very least, the requirements of 300.11(C) should be waived. Section 300.11(C) is clearly not applicable to optical fiber cables. Typical installation practice is to lash optical fiber cables together to form a "cable assembly". This frequently occurs during modifications or additions to an existing installation. Optical fiber cables are physically smaller and lighter than power cables and carry no power. Application of 300.11(C) is overly restrictive and will preclude lashing of optical fiber cables together to form a cable assembly. Optical fiber cables secured in this manner have adequate support (see 300.11(A)), are supported independently of the suspended ceiling grid, and are not likely to collapse in the event the suspended ceiling collapses. Such restriction imposes additional installation costs with no improvement in safety. See my companion comment on Proposal 16-44.

Panel Meeting Action: Reject
Panel Statement: Inclusion of this Fine Print Note is in direct conflict with 90.1(C). The action to reject proposal 16-3, one technical committee member promotes the addition of Fine Print Notes, serves no benefit to the NEC an Annex should be included with coupons for the code user. If the NEC was amended, it should be amended through analysis by technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 16-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP16 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IBEW, IAEL, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAL, NYBFEU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative:
PREZIOSO, L.: While I agree with the panel action based on the specific wording of the comment, the proposal referenced a fine print note (FPN) identifying an ANSI/NECA/BICS Standard as the source for identifying accepted industry practices. The comment writer made the intent of the comment clear in the substantiation, but the panel’s action disregarded the substantiation based on an incorrect reference in the recommendation. While it

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative:
PREZIOSO, L.: While I agree with the panel action based on the specific wording of the comment, the proposal referenced a fine print note (FPN) identifying an ANSI/NECA/BICS Standard as the source for identifying accepted industry practices. The comment writer made the intent of the comment clear in the substantiation, but the panel’s action disregarded the substantiation based on an incorrect reference in the recommendation. While it
4. The FPN should not be accepted because numerous standards and
PREZIOSO, L.: See my explanation of affirmative vote on Comment 16-34.
3. These standards are also covered by a Fine Print Note in 110.12.
1. The trend by the CMPs over the last several code cycles has been to limit
abandoned cable.

The reasons to continue to Accept the Proposal are as follows:
1) On the issue of abandoned cable removal, the task group agreed that
only the accessible portions of abandoned cable should be removed. To
require removal of all cable could, in some cases, necessitate demolition of
the building finish in order to access cables that were properly fastened to the
building finish in accordance with the rules in the various code articles. Furthermore,
require removal of all cable could, in some cases, necessitate demolition of
the building finish in order to access cables that were properly fastened to the
building finish in accordance with the rules in the various code articles. Furthermore,
the task group agreed that the requirements for abandoned cable removal
should not be in Section X.3 (Locations and Other Articles) but should be
relocated into the general requirements of each article.
2) The task group also agreed to recommend the addition of a new Fine Print
Note to further explain the removal requirement. This addition was thought to be
necessary to address a common practice of cables that are “fished” inside
eexisting walls. These cables, if abandoned, can be disconnected from their
junction point in a wall and pulled out of the wall without having to harm the
building finish. At present, in many cases, these cables are being cut off above
the wall and left to drop into the wall space.
3) On the issue of “tagged for future use”, the Task Group agreed that it was
not necessary to require anything more than the cable tag being “...of
sufficient durability to withstand the environment involved.” This phrase is
used in several other places in the NEC and leaves it up to the AHJ as to what
is suitable. This language does not add requirements that are difficult, if not
impossible, to enforce by adding unclear requirements for rodent-resistance,
etc.

Panel Meeting Action: Accept in Principle
Change the FPN of 770.25, 800.25, 820.25, and 830.25 as follows:
" 770.25 Abandoned Cables. The accessible portion of abandoned coaxial
cables shall be removed. Where cables are identified for future use with a tag,
the tag shall be of sufficient durability to withstand the environment involved.
800.25 Abandoned Cables. The accessible portion of abandoned
communications cables shall be removed. Where cables are identified for
future use with a tag, the tag shall be of sufficient durability to withstand the
environment involved.
800.25 Abandoned Cables. The accessible portion of abandoned
communications cables shall be removed. Where cables are identified for
future use with a tag, the tag shall be of sufficient durability to withstand the
environment involved.
FPN: See Article 100 for a definition of accessibility. It is desirable to remove
as much abandoned cable as is practical, but it is not the intent of this section
to require construction or renovation specifically to facilitate the removal of
abandoned cable.
800.25 Abandoned Cables. The accessible portion of abandoned
cables shall be removed. Where cables are identified for future use with a tag,
the tag shall be of sufficient durability to withstand the environment involved.
FPN: See Article 100 for a definition of accessibility. It is desirable to remove
as much abandoned cable as is practical, but it is not the intent of this section
to require construction or renovation specifically to facilitate the removal of
abandoned cable.
16-38 Log #868 NEC-P16 Final Action: Reject
(770.42, FPN )

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 16-46
Recommendation: The panel is encouraged to continue to Reject Proposal 16-46.
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.
Panel Meeting Action: Reject
Panel Statement: The panel action on Proposal 16-46 was to accept in principle; therefore the panel cannot accept the submitter’s recommendation to continue to reject.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

16-39 Log #244 NEC-P16 Final Action: Accept in Principle
(770.93)

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-54
Recommendation: Accept this proposal in principle by revising 770.93 as shown below:
Where exposed to contact with electric light or power conductors, the non-current-carrying metallic members of optical fiber cables entering buildings shall be grounded as close to the point of entrance as practicable or shall be interrupted as close to the point of entrance as practicable by an insulating joint or equivalent device.
Optical fiber cables entering buildings or attaching to buildings shall comply with (A) or (B).

(A) Entering Buildings. In installations where an optical fiber cable is exposed to contact with electric light or power conductors and enters the building, the non-current-carrying metallic members shall be either grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.

(B) Terminating Outside of the Building. In installations where an optical fiber cable is exposed to contact with electric light or power conductors and the cable is terminated outside of the building, the non-current-carrying metallic members shall be either grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment or termination of the cable.

Substantiation: The suggested text is an editorial clarification. The text the panel accepted deals with two scenarios, installations where the cable enters the building and installations where the cable is terminated outside of the building. The non-current-carrying metallic members shall be either grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment or termination of the cable.

16-40 Log #1533 NEC-P16 Final Action: Accept
(770.93)

Comment on Proposal No: 16-4
Recommendation: Accept this proposal in principle by revising 770.93 as shown below:
Where exposed to contact with electric light or power conductors, the non-current-carrying metallic members of optical fiber cables entering buildings shall be grounded as close to the point of entrance as practicable or shall be interrupted as close to the point of entrance as practicable by an insulating joint or equivalent device.
Optical fiber cables entering the building or terminating on the outside of the building shall comply with (A) or (B).

(A) Entering Buildings. In installations where an optical fiber cable is exposed to contact with electric light or power conductors and the cable enters the building, the non-current-carrying metallic members shall be either grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.

(B) Terminating On the Outside of the Building. In installations where an optical fiber cable is exposed to contact with electric light or power conductors and the cable is terminated on the outside of the building the non-current-carrying metallic members shall be either grounded as specified in 770.100, or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.

Substantiation: The Panel, in revising this section, recognized that the cable does not always enter the building. In many cases it is terminated on the outside of the building in an Optical Network Termination (ONT) or similar device. In attempting to accommodate this scenario, the Panel added the text “or attached” and “point of attachment”. However, the addition of that text is misleading and will result in impractical and unwieldy grounding and interruption requirements. The suggested text provides editorial clarification by addressing the two scenarios, cables entering the building and cables terminating on the outside of the building, separately. Further, the suggested text eliminates any confusion that may result from the use of the terms “attached” and “point of attachment”, and addresses the issue directly: cables that are terminated on the outside of the building. The phrase “connected to an electrode by a grounding conductor” as contained in Proposal 16-4 (770.53) and in the 2008 NEC Draft is unnecessary as the Panel has accepted the addition of the prescriptive grounding requirements of 770.100 (see Proposal 16-25). The text “as specified in 770.100” is added for consistency with the Panel Action on Proposal 16-4 for 800.93, 820.93 and 830.93

16-41 Log #1107 NEC-P16 Final Action: Accept
(770.93, FPN (New))

TCC Action: The Technical Correlating Committee directs that the action on this comment be reported as “Accept.”

The Technical Correlating Committee notes that a Fine Print Note directing the user from 770.93 back to 770.2 is unnecessary since it is in the same article.
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-56
Recommendation: The Panel Action on the Proposal should be Reject.
Substantiation: I agree with the Explanation of Negative submitted by H. Ohde.
Also, the Technical Correlating Committee action on Proposals 16-116 and 16-117, which states in part “It is the intention of Fine Print Notes to provide explanatory information and they are not intended as a vehicle to provide unnecessary cross-references.” provides a valid reason to not include the FPN.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-224.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-42 Log #1531 NEC-P16 Final Action: Accept
(770.100(B))

Comment on Proposal No: 16-25
Recommendation: Revise the text of 770.100(B) as follows: “(B) Electrode. The grounding conductor shall be connected in accordance with 770.100 (B) (1), (B) (2) and (B) (3).”
Substantiation: The present text is incorrect as 700.110 (B) refers to three individual requirements that are appropriate under three separate circumstances. They are not to be done simultaneously. Hence, “and” should be replaced by “or.”

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-18.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-43 Log #1557 NEC-P16 Final Action: Accept (770.100(B))


Comment on Proposal No: 16-25
Recommendation: Continue to accept the proposal, but change the term “Intersystem Bonding Termination” to “Interconnection Bonding Termination.”

Substantiation: This proposal is the result of a comment on Proposals 8-52-5 and 8-78 that was accepted by the Technical Correlating Committee.

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-18.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-44 Log #2002 NEC-P16 Final Action: Reject (770.113)

TCC Action: The Technical Correlating Committee understands that the text of 770.113 is to be constructed as follows:
Proposal 16-50 shows the title, proposal 16-57 shows the first sentence, and Proposal 16-52 introduces a new Exception to 770.113.
Proposal 16-52 revised exceptions in the 2005 NEC into positive language in 770.48(A) and (B).
The Technical Correlating Committee directs that the new Exception be written as a complete sentence in accordance with Section 3.1.4.1 of the NEC Style Manual as follows:
“Exception: Optical fiber cables that comply with 770.48 shall not be required to be listed.”
Submitter: Noel Williams, Herriman, UT
Comment on Proposal No: 16-60
Recommendation: This proposal should have been Rejected.
Substantiation: This proposal conflicts with the language in Proposal 16-57 which was also accepted, and which includes much better language. Proposal 16-57 says where optical fiber cables are installed in buildings they must be listed. This proposal says, literally, listed optical fiber cables must be installed in all buildings. The change in the exception language is unnecessary. If the cable is listed it has to be marked. The change in title is also unnecessary - the content is about listed cables - where they are necessary and where they are not.

Panel Meeting Action: Reject
Panel Statement: The actions on Proposals 16-57 and 16-60 are not in conflict. The action on Proposal 16-57 only changed the first sentence of 770.113. The action on Proposal 16-60 left the first sentence of 770.113 unchanged.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-45 Log #162 NEC-P16 Final Action: Accept (770.113 and Table 770.113)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-60
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 16-57. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-44.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-46 Log #163 NEC-P16 Final Action: Accept (770.113 Exception No. 2)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-62
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposals 8-53 and 8-78. See Technical Correlating Committee action on Proposals 8-53 and 8-78. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider and correlate with the action on Proposals 8-53 and 8-78.

See panel action and statement on Comment 16-47. There is no requirement that RTRC have the appropriate fire properties to be suitable for this application.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: STENE, S.: 770.113, Exception No. 2 currently allows rigid nonmetallic conduit Type RNC in accordance with Article 352. RNC includes Rigid Polyvinyl Chloride Conduit; Type PVC; and Rigid Electrical Metallic Tubing; Type RTRC. A new Article 355 is being created to cover RTRC, which will then be removed from Article 352. The panel action to remove RTRC from the list of acceptable raceways effectively removes a product which was previously acceptable.

16-47 Log #361 NEC-P16 Final Action: Accept in Part (770.113 Exception No. 2)

TCC Action: The Technical Correlating Committee understands that the change indicated in the panel action should occur in 770.48(B). There is no change in 770.113 as a result of the panel action on this proposal.
Submitter: Code-Making Panel 8,
Comment on Proposal No: 16-62
Recommendation: CMP-16 should accept Proposal 16-62 as originally proposed.
Substantiation: CMP-16 should accept Proposal 16-62 as originally proposed to correlate with the action taken by CMP-8 on Proposals 8-53 and 8-78.
This comment has been balloted through CMP-8 with the following ballot results:
12 Eligible to Vote
11 Affirmative
1 Negative
Mr. Loyd voted negatively stating: “Proposal 16-62 was to Reject. I agree with Mr. Burn’s recommendation to revise the panel action, but it should be Accepted in Principle as follows:
“Recommended change:
Revise 770.113, Exception No. 2 to read as follows: “Exception no. 2: Nonconductive optical fiber cables shall not be required to be listed and marked where the cable enters the building from the outside and is in raceway systems installed in compliance with any of the following Articles in Chapter 3; Article 342, Intermediate Metal Conduit; Type IMC; Article 344, Rigid Metal Conduit; Type RMC; Article 352, PVC Conduit; Article 355, Reinforced Thermosetting Resin Conduit, Type RTRC; and Article 358, Electrical Metallic Tubing, Type EMT.”
Substantiation: This change is necessary to correlate with the actions of CMP-8.”

Panel Meeting Action: Accept in Part
Revise 770.113 Exception No. 2 as follows:
Exception No. 2: Nonconductive optical fiber cables shall not be required to be listed and marked where the cable enters the building from the outside and is run in raceway systems installed in compliance with any of the following articles in Chapter 3; Article 342, Intermediate Metal Conduit; Type IMC; Article 344, Rigid Metal Conduit; Type RMC; Article 352, PVC Conduit; Article 355, Reinforced Thermosetting Resin Conduit, Type RTRC; and Article 358, Electrical Metallic Tubing, Type EMT.
Panel Statement: The panel accepts the use of PVC conduit and rejects the use of RTRC. There is no requirement for RTRC to have the appropriate fire properties to be suitable for this application.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: STENE, S. See my explanation of negative vote on Comment 16-46.

16-48 Log #393 NEC-P16 Final Action: Accept in Part (770.113 Exception No. 2)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 16-62
Recommendation: This proposal should be Accepted in Principle and revised to read as follows:
Exception No. 2: Nonconductive optical fiber cables shall not be required to be listed and marked where the cable enters the building from the outside and is run in raceway systems installed in compliance with any of the following articles in Chapter 3; Article 342, Intermediate Metal Conduit; Type IMC; Article 344, Rigid Metal Conduit; Type RMC; Article 352, PVC Conduit; Article 355, Reinforced Thermosetting Resin Conduit; Type RTRC; and Article 358, Electrical Metallic Tubing, Type EMT.

Panel Statement: The panel accepts the use of PVC conduit and rejects the use of RTRC. There is no requirement for RTRC to have the appropriate fire properties to be suitable for this application.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: STENE, S. See my explanation of negative vote on Comment 16-46.
This FPN is being misinterpreted and used in aggressive marketing attempts to install above the suspended ceiling. Although the installer had met the occupancy until the communications cabling was either replaced with limited within the concealed space.

The Standards Council issued two decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address Code Making Panel (CMP) decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.” The later decision states, in pertinent part, as follows: “if the fine print notes are not consistent with NEC 13 or engineer confidence and the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.”

This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at http://www.dupont.com/cablingsolutions/products/codes.html). The FPN has a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. As an example, an AHJ in Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of the NEC, the FPN misled the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CPM cabling was installed above the suspended ceiling.

If bundles of unshielded computer wiring are installed above the ceiling or beneath the floor in a manner where fire propagation in all directions is likely, then understanding of the NEC itself since, currently, the fine print notes at issue do not sufficiently vetted to industry and that the TCC should review this matter. The 2007 edition of NFPA 13 also could be in violation of Standards Council Decision D#05-24 to remain status quo on these issues.

Submitter: Robert W. Jensen, dbi

Recommendation: Accept proposal to delete Fine Print Note

Final Action: Reject

Submitter: William Wagner, Certification Solutions

Proposal on Comment No: 16-62

Final Action: Accept in Part

Submitter: Michael Dollard, duPont

Proposal on Comment No: 16-50

Final Action: Reject

Submitter: OHDE, H.

Proposal on Comment No: 16-70

Final Action: Reject

Submitter: JOHNSON, S.

Proposal on Comment No: 16-70

Final Action: Reject

Submitter: STENE, S.

Proposal on Comment No: 16-51

Final Action: Reject

Submitter: Robert W. Jensen, dbi

Comment on Proposal No: 16-70

Recommendation: Accept proposal to delete Fine Print Note

Final Action: Reject

Submitter: Robert W. Jensen, dbi

Comment on Proposal No: 16-51

Recommendation: Accept proposal to delete Fine Print Note

Final Action: Reject

Submitter: Robert W. Jensen, dbi

Report on Comments A2007 — Copyright, NFPA

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: 3

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Rejected


Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: 0

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: 0

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: 0

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: 0

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: 0

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: 0

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 16-47.
This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at https://www.dupont.com/cabling/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of the NEC, the FPN misled the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The installation of the CMP cable was allowed.

To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers (see 8.14.1.2.1). The FPN could be worded in such a way as to make it clear that combustibles become necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat.

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage. BICSI, which represents 24,000 installers, designers and manufacturers, feels that this last minute interjection of a FPN was not sufficiently vetted to industry and that the TCC should review this matter.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.
OHDE, H.: See my Explanation of Negative for Comment 16-50.

16-52 Log #1772 NEC-P16 Final Action: Reject
(770.154)

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-71
Recommendation: Accept proposal to delete Fine Print Note

Substantiation: The Standards Council issued two decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address Code Making Panel (CMP) decisions on Fine Print Note referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 810.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC Project would have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).” The decision then states: “nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. Proposals to the fine print notes were filed and rejected by the responsible CMP based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is clearly open for further consideration and action during the Comment phase.”

This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at https://www.dupont.com/cabling/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of the NEC, the FPN misled the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The installation of the CMP cable was allowed.

To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers (see 8.14.1.2.1). The FPN could be worded in such a way as to make it clear that combustibles become necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat.

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage. BICSI, which represents 24,000 installers, designers and manufacturers, feels that this last minute interjection of a FPN was not sufficiently vetted to industry and that the TCC should review this matter.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.
OHDE, H.: See my Explanation of Negative for Comment 16-50.

16-53 Log #1773 NEC-P16 Final Action: Reject
(770.154)

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-78
Recommendation: Accept proposal to delete Fine Print Note

Substantiation: The Standards Council issued two decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address Code Making Panel (CMP) decisions on Fine Print Note referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 810.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC Project would have the ability to delete them and nothing in the Council’s status quo
that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue. The later decision states, in pertinent part, as follows: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).” The decision also states: “in nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. Proposals to the fine print notes were filed and rejected by the responsible CMP based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is clearly open for further consideration and action during the Comment phase.”

This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at http://www.dupont.com/cablingsolutions/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of the NEC, the FPN mislead the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The installation of the CMP cable was allowed.

To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided) of the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. Proposals to the fine print notes were filed and rejected by the responsible CMP based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is clearly open for further consideration and action during the Comment phase.”

This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at http://www.dupont.com/cablingsolutions/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of the NEC, the FPN mislead the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The installation of the CMP cable was allowed.

To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers (see 8.14.1.1). The threshold value at which sprinklers become necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat. If bundles of unheated computer wiring are installed above the ceiling or beneath the floor in a manner where fire propagation in all directions is likely, then the concealed space should be treated the same as a combustible space, thereby requiring appropriate sprinkler protection.”

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage. BICSI, which represents 24,000 installers, designers and manufacturers, feels that this last minute interjection of a FPN was not sufficiently vetted to industry and that the TCC should review this matter. Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN. JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: See my Explanation of Negative for Comment 16-50.

Panel Meeting Action: Reject
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN. JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: See my Explanation of Negative for Comment 16-50.
of "concealed spaces", therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1.0.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection. 8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1.)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited occupancies or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constituted of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee's substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-56 Log #1466 NEC-P16 Final Action: Reject
(770.154, 770.179, 800.154, 800.179, 820.154, and 820.179)

Comment on Proposal No: 16-69
Recommendation: Reconsider and accept the proposals.
Substantiation: The Panel erred in applying the Council’s directive on NFPA 90A, related to materials exposed to airflow in an air distribution system. The cables in each of the proposals did not have an “R” or “P” as the last letter in the type designation, so would not be permitted to be installed in a riser or air distribution system (air ducts and plenums). The cables would only be permitted as other wiring within buildings.
Panel Meeting Action: Rejected
Panel Statement: Cable meeting specifications as described in this comment are not prohibited by the Code, and the panel sees no need for an additional marking.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-57 Log #366 NEC-P16 Final Action: Accept
(770.154 & 800.154)

TCC Action: The Technical Correlating Committee directs that these comment changes occur in 770.154(E) and the Table titled with 770.154(E) based on the action taken in Proposal 16-68.
Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA
Comment on Proposal No: 16-74
Recommendation: Accept this proposal in principle. Continue to accept the recommendation in proposal 16-74 and, in addition, making the following changes and renumbering the titles of the Tables and Figures as shown.

770.154(F) Table 770.154 to be Table 770.154(F) and illustrated in Figure 770.154(F) shall be permitted.

800.154(G) Table 800.154 to be Table 800.154(G) and Figure 800.154 to be Figure 800.154(G).

FPN: See Figure 800.154, Cable Substitution Hierarchy.

Report on Comments  A2007 — Copyright, NFPA
Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities of misinterpretation are minimized in the 2007 Edition of NFPA 13. Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative: JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.

16-59 Log #742 NEC-P16  
(770.154, FPN )

Submitter: James T. Dollard, Jr., IBEW Local 98
Comment on Proposal No: 16-71
Recommendation: This proposal should be Accepted.
Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 and is included for your review. It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:
"If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC."

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:
(1) Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards.
(2) Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations.
(3) Promote Fine Print Notes referencing NFPA 13 in the NEC.
(4) Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required.
(5) Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13.
(6) Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted).
(7) Provide instructions for building officials to threaten and harass building owners to use the proponents products.

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one many “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 16 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that actual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Notes will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities of misinterpretation are minimized in the 2007 Edition of NFPA 13. Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative: JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.


16-60 Log #743 NEC-P16  
(770.154, FPN )

Submitter: James T. Dollard, Jr., IBEW Local 98
Comment on Proposal No: 16-78
Recommendation: This proposal should be Accepted.
Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 and is included for your review.

It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:
"If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC."

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:
(1) Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards.
(2) Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations.
(3) Promote Fine Print Notes referencing NFPA 13 in the NEC.
(4) Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required.
(5) Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13.
(6) Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted).
(7) Provide instructions for building officials to threaten and harass building owners to use the proponents products.

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one many “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 16 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that actual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Notes will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.
16-61 Log #744 NEC-P16 (770.154, FPN ) Final Action: Reject

**Submitter:** James T. Dollard, Jr., IBEW Local 98  
**Comment on Proposal No:** 16-81  
**Recommendation:** This proposal should be Accepted.

**Substantiation:** The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remove such “quotations” on issues with respect to NFPA 90A. This Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-69 and is included for your review. It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:

“If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC.”

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:

(1) Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards.

(2) Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations.

(3) Promote Fine Print Notes referencing NFPA 13 in the NEC.

(4) Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required.

(5) Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13.

(6) Label this deceptive literature, designed for building officials, as “Field Guides” or “Inspection Checklists.” (See an example field guide that I have submitted)

(7) Provide instructions for building officials to threaten and harass building owners to use the proponents products.

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to manipulate and misinform the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one many “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NEC committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.
**8.14.1.2** Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1) 8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

**Recommendation:** This proposal should be accepted.

**Comment on Proposal No:** 8.14.1.2.2

**Final Action:** Accept

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**8.14.1.2.1** Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

** CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC, therefore, it can and should be deleted.

**Panel Meeting Action:** Rejected

**Panel Statement:** The FPN continues to provide useful guidance. Possibilities of misinterpretation are minimized in the 2007 Edition of NFPA 13.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 12 Negative: 3

**Explanation of Negative:**

**JENSEN, R.:** This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.

**JOHNSON, S.:** See my explanation of negative vote on Comment 16-50.

**Final Action:** Reject
A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc., can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of limited combustible loading.

Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC. The panel accepts the direction of the TCC to clarify the panel action. The panel action on Proposal 16-80 should have read, “The panel accepts the submitter’s deletion in subsection (B)”.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

FPN: For information on Types CMP, CMR, CMG, CM, and CMX cables, see Appendix B of the NEC.

JENSEN, R.: This FPN, as informative text to the NEC, is being used to clarify the Panel Action on this Proposal and that further consideration be given to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.
OHDE, H.: See my Explanation of Negative for Comment 16-50.

Panel Meeting Action: Accept in Principle
(Figure 770.154)

FPN: See Figure 800.154, Cable Substitution Hierarchy.

Substantiation: A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc., can be present in concealed spaces constructed of limited or noncombustible materials but should not typically be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

The same change is being proposed to the corresponding Fine Print Notes in articles 800 and 820, all of which are included in the code that is a meaningless reference. Other references to NFPA 13, in Article 362, are properly included in mandatory sections of the code (section 362.10).

Everywhere a jurisdiction adopts NFPA 13 they need to adopt it for mandatory sections and not for an unenforceable FPN in one section, which is intended to mislead the user. In fact, NFPA 13 does not require that sprinklers be installed in plenums of “noncombustible or limited combustible construction”, even if “the usual amount of cabling” is present. In fact, there have been several documented examples already of misrepresentation in that authorities having jurisdiction have been told that this means that sprinklers are required in plenum areas unless “limited combustible cable” is installed. I have been personally involved in several cases, and have heard of many more cases where this is being stated.

Panel Meeting Action: Reject
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC. The panel accepts the direction of the TCC to clarify the panel action. The panel action on Proposal 16-80 should have read, “The panel accepts the submitter’s deletion in subsection (B)”.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15


Substantiation: This is one of three references to NFPA 13 (it is repeated identically in articles 770, 800 and 820) included in the code that is a meaningless reference. Other references to NFPA 13, in Article 362, are properly included in mandatory sections of the code (section 362.10).

Whenever a jurisdiction adopts NFPA 13 they need to adopt it for mandatory sections and not for an unenforceable FPN in one section, which is intended to mislead the user. In fact, NFPA 13 does not require that sprinklers be installed in plenums of “noncombustible or limited combustible construction”, even if “the usual amount of cabling” is present. In fact, there have been several documented examples already of misrepresentation in that authorities having jurisdiction have been told that this means that sprinklers are required in plenum areas unless “limited combustible cable” is installed. I have been personally involved in several cases, and have heard of many more cases where this is being stated.
These decisions address CMP decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dobbins asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.” The later decision states, in pertinent part, as follows: “if the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.”

Panel Meeting Action: Reject

Final Action: Reject (770.154(A), FPN )

Submitter: Donald Hall, Coning Cable Systems
Comment on Proposal No: 16-78
Recommendation: Note: The commenter is also submitting analogous comments to Proposal 16-197 (ROP Log #3097) and Proposal 16-329 (ROP Log #3095) pertaining to FPNs referencing NFPA 13 Section 8.14.1. Accept the proposal to delete the FPN, leading to the following: 770.154 Applications of Listed Optical Fiber Cables and Raceways. Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.154(A) through 770.154(E) or where cable substitutions are made as shown in 770.154(F).
(A) Plenums. Cables installed in ducts, plenums, and other spaces used for environmental air as described in 300.22(C). Only Type OFNP or OFC cable shall not be permitted to remain. Types OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Type OFNP or OFC cable shall be permitted to be installed in these raceways. FPN: See 8.14.1 of NFPA 13 (2003). Installation of Sprinkler Systems, for requirements for sprinklers in concealed spaces containing exposed combustibles.

Substantiation: The committee rejected this proposal without any consideration of its merits, based on its belief at the time that it fell within the scope of Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005. Since that time, however, the Standards Council has issued two new decisions as follows: Decision 06-06 (SC #6-3-18) dated 22 March 2006 states: in only permitted; “The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC Project would not violate the directive by deleting the Fine Print Notes as issue.”

Decision 06-19 (SC #06-7-33) dated 28 July 2006 states, in pertinent part: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.”

And

“it has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800 and 820), but not in others (Articles 725 and 760).”

And

“nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process.”

And

“If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC”. In view of the above decisions, the commenter requests that the proposal be considered on its merits as stated in the original proposal substantiation and as further substantiated below.

Since the original proposal was submitted, the following Annex Note was added to the 2007 Edition of NFPA 13: A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, nonstructural wood, etc. can be present in concealed spaces constructed of limited or noncombustible materials but not typically beyond the tolerance described in 8.14.1.1, for example, it is not the intent of this section to require sprinklers which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not well defined.

Additionally, the standard approach of the NEC is to require the use of listed products which are tested and approved by a Nationally Recognized Test Laboratory (NRTL) as being suitable for use in a particular application. Normal fire hazards associated with an application space and the application of wiring products installed within them are daily anticipated during the establishment of listing criteria for these products. Air handling spaces are no different from any other space in this regard. The inclusion and particular placement of this FPN is suggestive of the idea that the NEC or the NRTLs has failed to adequately recognize the hazards associated with these spaces. The safety record of plenum cables within air handling spaces has been debated extensively and is open to continued debate within the NFPA Code making process, but the FPN in question should not be used as a means to short circuit this process and lead users around the code. When properly understood, the FPNs of 770.154(A), 800.154(A), and 820.154(A) lead to a dead end. When not properly understood, they lead to an unnecessary encumbrance upon the use of listed products installed in accordance with approved NEC wiring methods.

Panel Meeting Action: Reject

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.
In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 770 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.
OHDE, H.: See my Explanation of Negative for Comment 16-50.

16-69 Log #957 NEC-P16 (770.154(A), FPN )
Some installations require large amounts of cable, although typically much less than an installation of metal conductors. A typical application of a fire hazard cable in a building with sprinkler protection may require consultation with the appropriate AHJ. Installers of cables in interstitial spaces need to be aware that they may impact the sprinkler system requirements.

Panel Meeting Action: Reject
Panel Statement: Cable meeting specifications as described in this comment is not prohibited by the Code, and the panel sees no need for an additional marking.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-72 Log #2017 NEC-P16 (Final Action: Accept)

Panel Meeting Action: Reject
Panel Statement: Cable meeting specifications as described in this comment is not prohibited by the Code, and the panel sees no need for an additional marking.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-73 Log #2271 NEC-P16 (Final Action: Hold)

Panel Meeting Action: Hold
Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

70-520
To put cable heat release in perspective, here are relative values:

- Polyolefin insulation (as used in PVC jackets) has a maximum potential heat release of around 8141 BTU/lb or 9 MJ/kg.
- Polyolefin insulation has a higher dielectric constant than PVC, making it better suited for electrical applications.

The key parameter in the listing requirements is potential heat release. Fire hazard cables specified in 770.154(C), and cables with low potential heat release shall be listed as fire hazard (-FHC) cable and shall have the suffix “-FHC”.

A backdoor approach might be to get NFPA 255 and NFPA 259 cables by demonstrating not to propagate fire when tested in accordance with NFPA 13, Standard Method of Test for Surface Burning Characteristics of Building Materials. These cables, extended for a period of 20 minutes in the form in which they are installed, shall not require sprinkler protection.

The panel action should be to reject the proposal. The first FPN in the Proposal defines the damage and specifies performance requirements.
It was the action of the Technical Correlating Committee that this Proposal 8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection. which deleted Article 780 and takes the following Actions to correlate with the Panel 7 concurs with the Action taken by Panel 10 to Accept Proposal 10-59 Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations reference to 780.5 in 334.104. This action will be considered by Code-Making Recommendation:

7-78 Log #68 NEC-P07

Ballot Results:

Affirmative: 15

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

ARTICLE 780 — CLOSED-LOOP AND PROGRAMMED POWER DISTRIBUTION

7-78 Log #68 NEC-P07

Final Action: Accept

(780)

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Final Action: Accept

(770.179(E))

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-93

Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to create a new cable designation (OFN50 and OFC50) is nothing more than a marketing ploy. The submitter’s recommendation to add these three FPNs to this section is in grave error. FPN No. 1 is a backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The FPN No. 2 would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13, Section 8.14.1. The submitter’s substantiation references 2002 NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc., can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 16 rejected this proposal based on the Standards Council decision D/05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept

Comment on Proposal No: 16-98

Recommendation: Accept proposal 16-98 in principle by revising the fine print notes in the proposal.

From:

FPN No. 1: For further information for fire alarm, sprinkler waterflow, and sprinkler supervisory systems see Article 760.

FPN No. 2: For installation requirements of optical fiber cables, see Article 770.

FPN No. 3: For installation requirements for network-powered broadband communications circuits, see Article 830.

FPN No. 4: For installation requirements for equipment and circuits in an information technology equipment room, see Article 645.

FPN No. 5: For further information on remote-control, signaling and power limited circuits, see Article 725.

To:

FPN No. 1: For installation requirements for information technology equipment and systems in an information technology equipment room, see Article 645.

FPN No. 2: For installation requirements for remote-control, signaling, and power-limited circuits, see Article 725.

FPN No. 3: For installation requirements for fire alarm systems see Article 760.

FPN No. 4: For installation requirements of optical fiber cables and raceways, see Article 770.

FPN No. 5: For installation requirements for network-powered broadband communications circuits, see Article 830.

Substantiation: The current scope of Article 800 and proposal 16-98 text refer to some articles “for installation requirements” and to other articles “for further information”. Section 3.3.5 of the NEC Style Manual states:

3.3.5 Parallel Construction. Parallel construction means stating similar requirements in similar ways for greater consistency. This helps makes the NEC easier for users. Lack of consistency often creates confusion, causing users to ask: Does this difference in wording represent a different requirement? Or is it simply two different ways of trying to say the same thing? There are several kinds of parallel construction:

Organization and Numbering. If practicable, the subsections of similar articles should be numbered in the same order (see 2.4.1).

Sections. Different sections, within the same article, that reflect similar or closely related subjects, should have similar structures.

Lists. All items in a list should be parallel (that is, singular or plural, written in the same verb tense, using phrases or sentences but not a mix).

This comment would make all the fine print note references consistent and parallel in the same numerical order as the articles referenced.

Other suggested changes are to use the language of the referenced article so as to improve clarity and consistency and to avoid any confusion between the content of the fine print notes and the scopes of the referenced articles.

Panel Meeting Action: Accept

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee that directs the working group “for installation requirements” in FPN No. 2 and FPN No. 3 be changed to “for further information” because Articles 725 and 760 refer to Article 800.

Submitter: Stanley Kaufman, CableSafe Inc.

Comments on Proposal No: 16-98

Ballot Results: Affirmative: 14

Number Eligible to Vote: 14

FPN No. 1: As written, “For installation requirements” may be misleading the designer, installer and code officials to believe, install and enforce the normal amount of cabling would not require sprinklers due to the construction of the space. The submitter’s substantiation references 2002 NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc., can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 16 rejected this proposal based on the Standards Council decision D/05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept

Comment on Proposal No: 16-98

Recommendation: Accept proposal 16-98 in principle by revising the fine print notes in the proposal.

From:

FPN No. 1: For further information for fire alarm, sprinkler waterflow, and sprinkler supervisory systems see Article 760.

FPN No. 2: For installation requirements of optical fiber cables, see Article 770.

FPN No. 3: For installation requirements for network-powered broadband communications circuits, see Article 830.

FPN No. 4: For installation requirements for equipment and circuits in an information technology equipment room, see Article 645.

FPN No. 5: For further information on remote-control, signaling and power-limited circuits, see Article 725.

To:

FPN No. 1: For installation requirements for information technology equipment and systems in an information technology equipment room, see Article 645.

FPN No. 2: For installation requirements for remote-control, signaling, and power-limited circuits, see Article 725.

FPN No. 3: For installation requirements for fire alarm systems see Article 760.

FPN No. 4: For installation requirements of optical fiber cables and raceways, see Article 770.

FPN No. 5: For installation requirements for network-powered broadband communications circuits, see Article 830.

Substantiation: The current scope of Article 800 and proposal 16-98 text refer to some articles “for installation requirements” and to other articles “for further information”. Section 3.3.5 of the NEC Style Manual states:

3.3.5 Parallel Construction. Parallel construction means stating similar requirements in similar ways for greater consistency. This helps makes the NEC easier for users. Lack of consistency often creates confusion, causing users to ask: Does this difference in wording represent a different requirement? Or is it simply two different ways of trying to say the same thing? There are several kinds of parallel construction:

Organization and Numbering. If practicable, the subsections of similar articles should be numbered in the same order (see 2.4.1).

Sections. Different sections, within the same article, that reflect similar or closely related subjects, should have similar structures.

Lists. All items in a list should be parallel (that is, singular or plural, written in the same verb tense, using phrases or sentences but not a mix).

This comment would make all the fine print note references consistent and parallel in the same numerical order as the articles referenced.
We understand and agree that the TCC has responsibility for Article Scope.

JENSEN, R.: We disagree with the definition of communications circuit as it
and twisted pair. Fiber optics is already an Article of its own.

as an example, this article may be focused on utility delivery up to the first
jurisdictional issues between Panels.

by allowing control over such a definition. Additionally, there will now be
apply different rules such as conduit fill requirements, and electrical protection.

clouds the scope of the article with other articles. As an example, a telephone
into a building) and building wiring segmented into other articles for coaxial
and twisted pair. Fiber optics is already an Article of its own.

We ask that there be no change to the current scope and definitions involved.
We also propose that a Task Group be assigned to approach this issue. As
an example, this article may be focused on utility delivery up to the first
connection within a building (today up to 50 ft from the entrance of the cable
into a building) and building wiring segmented into other articles for coaxial
and twisted pair. Fiber optics is already an Article of its own.

Substantiation:
The present text is unclear and may be construed as
not including all premises communications wiring and equipment, such
as a telephone or fax machine. For example, if a customer has a local
telecommunications switch or PBX, the communications circuit would include
not only the PBX, but all communications cabling and wiring connecting the
customer’s terminal equipment to the PBX.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative:
JENSEN, R.: We disagree with the definition of communications circuit as it
clouds the scope of the article with other articles. As an example, a telephone
circuit can be extended with 820 cable, or 725 cable. Jurisdictions can then
apply different rules such as conduit fill requirements, and electrical protection.

We understand and agree that the TCC has responsibility for Article Scope
statements. However, the scope has been released into the hands of a Panel
by allowing control over such a definition. Additionally, there will now be
jurisdictional issues between Panels.

We ask that there be no change to the current scope and definitions involved.
We also propose that a Task Group be assigned to approach this issue. As
an example, this article may be focused on utility delivery up to the first
connection within a building (today up to 50 ft from the entrance of the cable
into a building) and building wiring segmented into other articles for coaxial
and twisted pair. Fiber optics is already an Article of its own.

16-81 Log #248 NEC-P16 Final Action: Accept in Principle
(800.2)

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-98
Recommendation: Accept this proposal in principle in part by continuing to
accept the modification to the definition of the point of entrance and rejection
the addition of the fine print notes. Add the following additional definitions:
Intermediate Metal Conduit (Type IMC). The definition in 342.2 shall apply.
Rigid Metal Conduit (Type RMC). The definition in 344.2 shall apply.

Substantiation: Article 800 uses the terms Intermediate Metal Conduit
and Rigid Metal Conduit. These terms are defined in Articles 342 and 344
respectively. Because of 90.3 (excepted below), these definitions do not apply
to Chapter 8. They will apply if this comment is accepted.

Chapter 8 covers communications systems and is not subject to the
requirements of Chapters 1 through 7 except where the requirements are
specifically referenced in Chapter 8.

Panel Meeting Action: Accept in Part
Panel Statement: See panel action and comment on Comment 16-80.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative:
JENSEN, R.: We disagree with the definition of communications circuit as it
clouds the scope of the article with other articles. As an example, a telephone
circuit can be extended with 820 cable, or 725 cable. Jurisdictions can then
apply different rules such as conduit fill requirements, and electrical protection.

We understand and agree that the TCC has responsibility for Article Scope
statements. However, the scope has been released into the hands of a Panel
by allowing control over such a definition. Additionally, there will now be
jurisdictional issues between Panels.

We ask that there be no change to the current scope and definitions involved.
We also propose that a Task Group be assigned to approach this issue. As
an example, this article may be focused on utility delivery up to the first
connection within a building (today up to 50 ft from the entrance of the cable
into a building) and building wiring segmented into other articles for coaxial
and twisted pair. Fiber optics is already an Article of its own.

16-82 Log #249 NEC-P16 Final Action: Accept in Principle
(800.2)

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-98
Recommendation: Revise the definition of communications circuit as follows:
800.2 Communications Circuit. The circuit that extends voice, audio, video,
data, interactive services, telegraph (except radio), outside wiring for fire
alarm and burglary alarm from the communications utility to the customer’s
communications equipment up to and including terminal equipment such a
telephone or a fax machine.

Substantiation: The new scope statement for Article 800 relies on the
definition of “communications circuit”. The recommended definition clarifies
that the communications circuit extends up to the terminal equipment which
typically is a telephone. Without this revision, Article 800 could be interpreted
as ending at a PBX and not including all the cables, communications outlets,
fax machines and telephones in a typical office.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 16-80.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1
Explanation of Negative:
JENSEN, R.: We disagree with the definition of communications circuit as it
clouds the scope of the article with other articles. As an example, a telephone
circuit can be extended with 820 cable, or 725 cable. Jurisdictions can then
apply different rules such as conduit fill requirements, and electrical protection.

We understand and agree that the TCC has responsibility for Article Scope
statements. However, the scope has been released into the hands of a Panel
by allowing control over such a definition. Additionally, there will now be
jurisdictional issues between Panels.

We ask that there be no change to the current scope and definitions involved.
We also propose that a Task Group be assigned to approach this issue. As
an example, this article may be focused on utility delivery up to the first
connection within a building (today up to 50 ft from the entrance of the cable
into a building) and building wiring segmented into other articles for coaxial
and twisted pair. Fiber optics is already an Article of its own.

16-83 Log #254 NEC-P16 Final Action: Accept in Part
(800.2)

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-116
Recommendation: Accept this proposal in principle in part by continuing to
accept the modification to the definition of the point of entrance and rejection
the addition of the fine print notes. Add the following additional definitions:
Intermediate Metal Conduit (Type IMC). The definition in 342.2 shall apply.
Rigid Metal Conduit (Type RMC). The definition in 344.2 shall apply.

Substantiation: Article 800 uses the terms Intermediate Metal Conduit
and Rigid Metal Conduit. These terms are defined in Articles 342 and 344
respectively. Because of 90.3 (excepted below), these definitions do not apply
to Chapter 8. They will apply if this comment is accepted.

Chapter 8 covers communications systems and is not subject to the
requirements of Chapters 1 through 7 except where the requirements are
specifically referenced in Chapter 8.

Panel Meeting Action: Accept in Part
Delete FPNs No. 1 and No. 2
Panel Statement: The panel accepts the deletion of the FPNs and rejects the
addition of definitions, as they are covered by references to Chapter 3 within
800.110.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Explanation of Negative:
JENSEN, R.: We disagree with the definition of communications circuit as it
clouds the scope of the article with other articles. As an example, a telephone
circuit can be extended with 820 cable, or 725 cable. Jurisdictions can then
apply different rules such as conduit fill requirements, and electrical protection.

We understand and agree that the TCC has responsibility for Article Scope
statements. However, the scope has been released into the hands of a Panel
by allowing control over such a definition. Additionally, there will now be
jurisdictional issues between Panels.

We ask that there be no change to the current scope and definitions involved.
We also propose that a Task Group be assigned to approach this issue. As
an example, this article may be focused on utility delivery up to the first
connection within a building (today up to 50 ft from the entrance of the cable
into a building) and building wiring segmented into other articles for coaxial
and twisted pair. Fiber optics is already an Article of its own.

16-84 Log #660 NEC-P16 Final Action: Reject
(800.2)

Safety Council
Comment on Proposal No: 16-100
Recommendation: Delete the following text:
800.2 Air Duct. A conduit or passageway for conveying air to or from
heating, cooling, air conditioning, or ventilating equipment, but not including
the plenum.

Substantiation: The term “air duct” is not contained in article 800 and should
not, thus, be defined.

The same change is being proposed for the definition of “air duct” in article 820.

Report on Comments A2007 — Copyright, NFPA
We believe that the interpretation of whether being allowed to address the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A." 

However, Standards Council has since issued two new decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address CMP decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.” The later decision states, in pertinent part, as follows: “if the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).” The decision also states: “nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. The question whether the fine print notes should be in the NEC is hardly new. Aside from the fact that their presence was debated in the previous edition cycle, Proposals to remove them were duly filed and rejected by the responsible Code-Making Panel based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is, therefore, clearly open for further consideration and action during the Comment phase.” It would appear to me that these Standards Council decisions by implication would indirectly permit the deletion of definitions that violate the NEC manual of style. 

Panel Meeting Action: Reject
Panel Statement: As there was no opportunity for public review and comment the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:
JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.

We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. The proposal was “air duct cable” which was not to be used in the 2005 code.

Additionally, the term is not used within the text of the code is in violation of the Style Guide. We agree with deleting the term “air duct” as it was evidently an oversight from being deleted.

It would appear to me that these Standards Council decisions by implication would indirectly permit the deletion of definitions that violate the NEC manual of style.

Panel Meeting Action: Reject
Panel Statement: As there was no opportunity for public review and comment the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:
OHDE, H.: See my Explanation of Negative for Comment 16-84.

Panel Meeting Action: Accept in Part
Panel Statement: As there was no opportunity for public review and comment the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE, H.: See my Explanation of Negative for Comment 16-84.
Panel Statement: The panel accepts the deletion of the FPNs. See panel action and statement on Comments 16-100 and 16-83.

The Technical Correlating Committee has provided a valid reason to delete the FPNs.

Panel Meeting Action: Accept in Part

Panel Statement: A cable emerging from a rigid metal conduit or intermediate metal conduit may be considered as the “point of entrance” only if the metal conduit is properly grounded. Hence, the phase “connected by a grounding conductor to an electrode in accordance with 800.100(B)” is an integral and necessary part of the definition. See panel action and statement on Comment 16-87.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-87 Log #1109 NEC-P16  Final Action: Reject (800.2)

Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-117
Recommendation: The panel Action should continue to be Accept in Principle with the following additional revision to the Panel Action.

In the definition for Point of Entrance, delete the last phrase “connected by a grounding conductor to an electrode in accordance with 800.100(B).”

Substantiation: The deletion of the phrase is required to comply with 2.2.2 of the NEC Style Manual which states “Definitions shall not contain requirements or recommendations.” and 2.3.2.2 of the Manual of Style for NFPA Technical Committee Documents which states “Definitions shall not contain requirements.”

Panel Meeting Action: Reject

Panel Statement: the concealed space or plenums would be a requirement because of NFPA 13 references where 90A issues were involved to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.

I do not believe that this Standards Council decision would prohibit the definition of “air duct” from being deleted. I do believe that expansion of, or a new definition of, air duct in another Article would be a violation of Standards Council Decision D#05-24. Standards Council recently issued another decision (D#06-05(I)) which decided that 770.15(A)(4) (FPN) and 820.154(A) (FPN) may be deleted and this deletion would not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject

Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

16-88 Log #1535 NEC-P16  Final Action: Accept (800.2)

Comment on Proposal No: 16-148
Recommendation: Continue to reject this proposal.

Substantiation: This proposal should continue to be rejected as the application of the “block” concept by the telecommunications utilities has resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement accompanying Proposal 16-148 are appropriate and support continued rejections.

Panel Meeting Action: Accept

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-89 Log #1579 NEC-P16  Final Action: Reject (800.2)

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-99
Recommendation: This proposal should be accepted.

Substantiation: The term “air duct” is not used in Article 800 and, therefore, it should be deleted from 800.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

I do not believe that this Standards Council decision would prohibit the definition of “air duct” from being deleted. I do believe that expansion of, or a new definition of, air duct in another Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24. Standards Council recently issued another decision (D#06-03(I)) which decided that 770.15(A)(4) (FPN) and 820.154(A) (FPN) may be deleted and this deletion would not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject

Panel Statement: The panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

16-91 Log #1688 NEC-P16  Final Action: Accept (800.2)

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-110
Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to add this definition to 800.2 because the term “concealed space” is used 800.154(A) (FPN) is misleading. This definition does not belong in the NEC. The 800.154(A) (FPN) provided no guidance to designers, installers or code officials. This FPN has misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13—Copyright, NFPA NFPA 70
Section 8.14.1.1. It is important to note that the NEC does not have a definition of “concealed spaces” therefore the confusion and making it impossible to enforce. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction.

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces Not Requiring Sprinkler Protection. 8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154 and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC therefore it can and should be deleted. There is no need for the term “concealed spaces” to be defined.

Panel Meeting Action: Accept
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-92 Log #1775 NEC-P16 Final Action: Reject (800.2)

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-99
Recommendation: Accept this proposal.

080.2 Air Duct: A conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilating equipment, but not including the plenum. [NFPA 97:1.2.6] Substantiation: This was an apparent over-sight in the 2005 editorial review under the Standards Council mandate to remove content related to “air duct cable”, therefore not under the NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005. Additionally, “Air duct” is not a term used in Article 800 and therefore a violation of the NFPA Manual of Style.
Panel Meeting Action: Accept
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2
Explanation of Negative: JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.
We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.
We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.
OHDE, H.: See my Explanation of Negative for Comment 16-84.

16-94 Log #1777 NEC-P16 Final Action: Reject (800.2)

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-100
Recommendation: Accept this proposal.

080.2 Air Duct: A conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilating equipment, but not including the plenum. [NFPA 97:1.2.6] Substantiation: This was an apparent over-sight in the 2005 editorial review under the Standards Council mandate to remove content related to “air duct cable”, therefore not under the NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005.
Additionally, “Air duct” is not a term used in Article 800 and therefore a violation of the NFPA Manual of Style.
Panel Meeting Action: Reject
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2
Explanation of Negative: JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.
We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.
We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.
OHDE, H.: See my Explanation of Negative for Comment 16-84.
We believe that the interpretation of whether being allowed to address the OHDE, H.: See my Explanation of Negative for Comment 16-84.

JENSEN, R.: We disagree that there was no opportunity for public review.
We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.

OHDE, H.: See my Explanation of Negative for Comment 16-84.

16-95 Log #2054 NEC-P16 Final Action: Reject (800.2)

Comment on Proposal No: 16-118

Recommendation: This Proposal should be Accepted.

Substantiation: The term “air duct” is not used in Article 800 and, therefore, it should be deleted from 800.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

I do not believe that this Standards Council decision would prohibit the definition of “air duct” from being deleted. I do believe that expansion of or a new definition in another Article would be a violation of Standards Council Decision D#05-24. The Standards Council recently issued another decision (D#06-03) which decided that 770.154(A) FPN, 800.154(A) FPN, and 820.154(A) FPN may be deleted and this deletion would not be in conflict with the Standards Council decision D#05-24. Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject

Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explaination of Negative:

JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.

We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.

We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code.

Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.

OHDE, H.: See my Explanation of Negative for Comment 16-84.

16-96 Log #165 NEC-P16 Final Action: Accept (800.2. Communications Raceway (New))

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 16-108

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Delete the definition of Communications Raceway including the FPN.

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

Optical fiber raceway and innerduct are not the same. See 770.12(C) “Innerduct. Listed plenum optical fiber raceway, listed riser optical fiber raceway, or listed general-purpose optical fiber raceway installed in accordance with 770.154 shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.”

Communications raceways are a particular type of raceway and the definition of general raceway does not apply.

See 770.182 for listing requirements for optical fiber raceways, 800.182 for listing requirements for communications raceways, and 820.182 for listing requirements for CATV Raceways.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-99 Log #168 NEC-P16 Final Action: Accept (800.2. Point of Entrance)

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 16-117

Recommendation: It was the action of the Technical Correlating Committee that the panel reconsider the proposal with respect to the Fine Print Notes. It is the intention of Fine Print Notes to provide explanatory information and they are not intended as a vehicle to provide unnecessary cross-references. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the TCC to reconsider the proposal.

See panel action and comment on Proposal 16-83.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15
16-100 Log #621 NEC-P16 Final Action: Accept in Part (800.2, 820.2, and 830.2)

Submitter: Stanley Kahn, Tri-City Electric Co. Inc.

Comment on Proposal No: 16-116

Recommendation: Accept these proposals in principle. Continue to accept the changes in the definition of point of entrance and do not accept the fine print notes referring to the definitions of Intermediate Metal Conduit and Rigid Metal Conduit. Instead, accept two definitions shown below in 800.2, 820.2 & 830.2.

Intermediate Metal Conduit (Type IMC): The definition in 342.2 shall apply. Rigid Metal Conduit (Type RMC): The definition in 342.2 shall apply.

Substantiation: The listing requirements for Intermediate Metal Conduit and Rigid Metal Conduit are used in Articles 800, 820 without definition. They need to be defined. The definitions in Articles 342 and 344 do not apply to Article 800, 820, and 830 unless they are specifically referenced from these articles.

Since the referenced Proposals are parallel for the three Articles, the same Comment applies to all.

Panel Meeting Action: Accept in Part

Delete FPNs No. 1 and No. 2.

Panel Statement: The panel accepts the deletion of the FPNs and rejects the addition of the two definitions, as they are covered by references to Chapter 3 within 800.110, 820.110, and 830.110.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-101 Log #255 NEC-P16 Final Action: Reject (800.2 and 770.2)

Submitter: Stanley Kaufman, CableSafe Inc.

Comment on Proposal No: 16-108

Recommendation: Continue to accept the definition of communications raceway.

Revise the definition of Optical Fiber Raceway as shown:

Optical Fiber Raceway. A raceway designed for enclosing and routing listed optical fiber cables.

Substantiation: The listing requirements for Communications Raceway are in section 800.182. It is appropriate to have a definition in this article.

The listing requirements for Optical Fiber Raceways are in section 770.182 and the definition is in section 770.2. The suggested change in the definition of Optical Fiber Raceway will make it parallel to the definition of Communications Raceway that was accepted in proposal 16-108.

See proposal 16-245 where the panel accepted a similar definition for CATV Raceway. The listing requirements for CATV Raceways are in section 820.182.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 16-96.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-102 Log #169 NEC-P16 Final Action: Accept (800.3(A) and (B))

TCC Action: The Technical Correlating Committee directs that item (C) and the FPN in the panel action be deleted to correlate with the action on Proposal 10-59 to delete Article 780 in its entirety.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 16-121

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting and that this Proposal be reconsidered and correlated with the action on Proposal 16-221.

The Technical Correlating Committee directs that the panel consider not only the division applications, but also the zone applications.

In addition, the Technical Correlating Committee understands that the word "and" in (A) of the Proposal is not "Acceptable.

This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Change 800.3 to read as follows:

800.3 Other Articles.

(a) Hazardous (Classified) Locations. Communications circuits and equipment installed in a location that is classified in accordance with 500.5 and 505.5 shall comply with the applicable requirements of Chapter 5.

(b) Equipment in Other Space Used for Environmental Air. Section 300.22(C) shall apply.

(c) Hybrid Power and Communications Cables. The provisions of 780.6 shall apply for listed hybrid power and communications cables in closed-loop and programmed power distribution.

FPN: See 800.179(I) for hybrid power and communications cable in other applications.

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

Assuming Comments 16-173 and 174 are accepted, the numbering in the panel action on the proposal now becomes correct

Proposal 16-121 deleted a reference to the entire Article 500 and substituted a reference to 500.5 in order to comply with Section 4.1.1 of the NEC Style Manual.

The panel notes that the text concerning hybrid power and communications cables was mistakenly omitted from the preprint and should be restored as indicated.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-103 Log #170 NEC-P16 Final Action: Accept (800.3(C))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 16-125

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 16-128. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel has reviewed the panel action on Proposal 16-125 and finds no conflict with the panel action on Proposal 16-128. Proposal 16-125 was accepted in part as the information on “spread of fire or products of combustion” was moved to 800.26 (New). Rather than reference 300.21, the information appropriate to communications systems was extracted and placed directly in new 800.26.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-104 Log #1226 NEC-P16 Final Action: Accept (800.3(C))

Submitter: John Burke, Fusion Cable Systems

Comment on Proposal No: 16-123

Recommendation: Continue to Reject this Proposal.

Substantiation: We remove old and unused cable as part of our standard business practice especially in retrofit jobs. The amount of old cable on some jobs has caused damage to the building and created unsafe working conditions for our techs. We support continuing the abandoned cable removal requirement in the Code.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-105 Log #2055 NEC-P16 Final Action: Reject (800.3(C), 800.25, and 800.26)

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-129

Recommendation: This Proposal should have been Rejected.

Substantiation: The submitter’s recommendation to add a new 800.26 with this FPN No. 2 to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13, Section 8.14.1. The submitter’s substantiation references 2002 NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard, 8.14.1 of NFPA 13 has been revised to read as follows: 8.14.1.2 Concealed spaces not requiring sprinkler protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

Final Action: Reject
A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, if not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 16 should have rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154, and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject
Panel Statement: The panel rejected the text that the submitter of the comment objected to.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-106 Log #2056 NEC-P16 (800.3(C), 800.25, and 800.26) Final Action: Reject
Submitter: Harold C. Ohde, IBEW #134
Comment on Proposal No: 16-130
Recommendation: This Proposal should have been Rejected.
Substantiation: The submitter’s recommendation to add a new 800.26 with this FPN No. 2 to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13, Section 8.14.1. The submitter’s substantiation references 2002 NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard.
8.14.1.4 of NFPA 13 has been revised to read as follows:
8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection
8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)
8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, if not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 16 should have rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted from Sections 770.154, 800.154, and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject
Panel Statement: The panel rejected the text that the submitter of the comment objected to.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-107a Log #CC1602 NEC-P16 (800.24, 820.24 and 830.24 FPN) Final Action: Accept
Submitter: Code-Making Panel 16,
Comment on Proposal No: 16-139
Recommendation: Revise the Fine Print Note in 800.24, 820.24 and 830.24 to read as follows: FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.
Substantiation: ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling has now been published. The Panel intends to update to the now-current dated document.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-108 Log #171 NEC-P16 (800.24) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-135
Recommendation: The Technical Correlating Committee notes that neither the panel statement nor the revised statement shown in the affirmative vote are responsive to the submitter’s substantiation for the recommendation. The Technical Correlating Committee directs the panel to act on the merits of the recommendation. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting and continues to reject the proposal.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Final Action: Accept in Part
16-107 Log #247 NEC-P16 (800.3(D))
Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-109
Recommendation: Accept proposal 16-109 in principle by continuing to re-letter the current 800.3(D) to 800.3(C) and establishing a new 800.3(D) as follows:
(D) Network-Powered Broadband Communications Systems. Article 830 shall apply to network-powered broadband communications systems.
Substantiation: With the acceptance of proposal 16-98 it may not be clear that Article 830 applies to network-powered broadband communications systems. Addition of the suggested text will add clarity.
Panel Meeting Action: Accept in Part
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-107 Log #CC1602 NEC-P16 (800.24, 820.24 and 830.24 FPN) Final Action: Accept
Submitter: Code-Making Panel 16,
Comment on Proposal No: 16-139
Recommendation: Revise the Fine Print Note in 800.24, 820.24 and 830.24 to read as follows: FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.
Substantiation: ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling has now been published. The Panel intends to update to the now-current dated document.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-108 Log #171 NEC-P16 (800.24) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-135
Recommendation: The Technical Correlating Committee notes that neither the panel statement nor the revised statement shown in the affirmative vote are responsive to the submitter’s substantiation for the recommendation. The Technical Correlating Committee directs the panel to act on the merits of the recommendation. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting and continues to reject the proposal.
The requirements of 300.11 are applicable to communications cables, are not overly restrictive and are appropriate. Requiring any and all cables to be properly supported is not overly restrictive and is appropriate. Securing an additional cable to an existing properly supported cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative: BRUNSSE J: Proposal 16-135 should have been accepted. See my explanation of negative vote on Comment 16-114.
Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA
Comment on Proposal No: 16-134
Recommendation: Reject the Proposal.
Substantiation: Although I agree with the proposal and the submitter’s intent to introduce consistency, the material is used in plenums and other air handling spaces. Consequently, the proposal should have been subjected to the direction given by the Standards Council, as were many other proposals which were rejected.
As Mr. Dorna noted in his “Explanation of Negative Vote”, “The UL Directory (2005) shows that category ZODC covers “cable ties, cable tie mounts and similar types of related hardware”. Likewise, Conduit and Fittings, category DWVF covers “cable ties, conduit straps, staples and similar hardware...” Both categories list as “Suitable for use in air handling spaces in accordance with Sec 300.22(C) and (D) of the National Electrical Code.”
This proposal should have been rejected because of the Standards Council decision concerning NFPA 90A. Code Making Panels must be consistent in their handling of all submitted proposals.
Panel Meeting Action: Reject
Panel Statement: This is not a 90A issue.
The guide information for ZODC, Wire Positioning Devices states that: “The investigation of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance and weatherability characteristics as appropriate for the product.”
These are all characteristics that we should be concerned about for electrical installations.
The reference to air handling spaces is only a reference and is stated as: “…for those devices which have been investigated to determine their suitability for use in air handling areas...”
This is a standard statement that is found in a wide variety of listing categories including the category for IT and Telecom equipment to cover situations where a special investigation is done to evaluate a device for air handling spaces. It no way implies that devices in the category are automatically intended for air handling spaces.

Submitter: Timothy P. McNiece, Thomas & Betts Corporation
Comment on Proposal No: 16-137
Recommendation: Accept the panel action but delete the requirement that hardware be “listed” in 800.24. Add the following sentence before the last sentence in 800.24:
“Cable ties that provide primary support for optical fiber cables and raceways shall have a minimum loop tensile strength of 23 kg (50 lbs.)”
Substantiation: Adding a requirement that all hardware be “listed” is far from editorial as asserted in the substantiation accompanying the proposal. The panel is intended to consider the listings for specific types of hardware. The scope of this standard states: “1.1 This standard applies to those metallic and nonmetallic devices used for positioning - which may include bundling and securing - or to a limited extent supporting cable, wire, conduit, or tubing of a wiring system in electrical installations, to reduce the risk of fire, electric shock, or injury to persons.”

Panel Meeting Action: Reject
Panel Statement: There is more to listing than mechanical strength. Also, the mechanical strength should be based on the use and ratings of the device.
Cable ties can be used for securing and supporting cables in a number of Chapter 3 wiring methods without any requirements for a minimum loop tensile strength of 23 kg (50 lb) or any particular strength. For example, 334.30 covering securing and supporting of “nonmetallic-sheathed cable requires supporting and securing by staples, cable ties, straps, hangers, or similar fittings designed and installed so as not to damage the cable, at intervals not exceeding 1.4 m (4 1/2 ft) and within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting.” Notice that it does not have any recommendation for the support strength, nor does it need this additional marking or special consideration. The cables may not be providing any support at all where the tie wrap is simply anchoring it to a beam or joist. Types AC and MC cable also give permission to use cable ties for securing and supporting these cables in 320.30 and 330.30, respectively. In addition, this amendment should be considered as providing new information that has not been reviewed as part of the process.
Listing includes an evaluation of the particular device that goes beyond the ability to support cable. The guide information for ZODC, Wire Positioning Devices states: “The investigation of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance, and weatherability characteristics as appropriate for the product.”
These are all characteristics that we should be concerned about for electrical installations.
Cable ties that provide primary support for optical fiber cables and raceways shall have a minimum loop tensile strength of 23 kg (50 lbs.).

Substantiation: See my comment on NOP 16-45. The panel is asked to consider the long-standing positions of CMP-7 and CMP-8 that do not require support hardware to be “listed”. No substantiation has been provided in the panel action that would differentiate treatment of fiber optic cables and raceways from other wiring systems with respect to support. The wide variety of hardware used for supporting cables and raceways are considered to be new information that has not been reviewed as part of the process.

Comment on Proposal No: 16-112 Log #482 NEC-P16
Submitter: Timothy P. McNeive, Thomas & Betts Corporation
Recommendation: Accept the panel action, accept in principle, but delete the word “listed”.

Panel Meeting Action: Reject
Panel Statement: There is more to listing than mechanical strength. Also, the mechanical strength should be based on the use and rating of the device.

Panel Meeting Action: Reject
Panel Statement: There is more to listing than mechanical strength. Also, the mechanical strength should be based on the use and rating of the device.

Final Action: Reject (800.24)

Comment on Proposal No: 16-141
Recommendation: Accept this proposal.
Substantiation: This proposal should be accepted. If the Panel continues to support the addition of the requirements of 300.11 to 800.24, then at the very least, the requirements of 300.11(C) should be waived. Section 300.11(C) is clearly not applicable to communications cables. Installation practice is to lash communications cables together to form a “cable assembly”. This frequently occurs during modifications or additions to an existing installation. Communications cables are physically smaller and lighter than power cables, operate at much lower voltages and are power-limited. Application of 300.11(C) is overly restrictive and will preclude lashing of communications cables together to form a cable assembly. Communications cables secured in this manner have adequate support (see 300.11 (A)), are supported independently of the suspended ceiling grid, and are not likely to collapse in the event the suspended ceiling collapses. Such restriction imposes additional installation costs with no improvement in safety. See my companion comment on Proposal 16-135.

Panel Meeting Action: Reject
Panel Statement: Securing an additional cable to an existing cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:
BRUNSSSEN, J.: This comment should have been accepted, as should the environmental conditions installations, to reduce the risk of fire, electric shock, or injury to persons.

Prezioso, L.: See my explanation of affirmative vote on Comment 16-34.

Panel Meeting Action: Reject
Panel Statement: Proposal 16-141 pertained to updating the FPN and not to delete it. The comment requests the FPN be deleted. The FPN provides valuable information and the panel intends for it to be retained but the date updated. The references provided in the FPN provide guidance for installation in a neat and workmanship like manner.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Proposal No: 16-138
Recommendation: The action should be to delete this Fine Print Note.
Substantiation: The addition of these NEC Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. Code Making Panel 16 should consider taking an action to delete this FPN to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP16 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFW and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: Proposal 16-138 pertained to updating the FPN and not to delete it. The comment requests the FPN be deleted. The FPN provides valuable information and the panel intends for it to be retained but the date updated. The references provided in the FPN provide guidance for installation in a neat and workmanship like manner.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Proposal No: 16-136
Recommendation: The panel is encouraged to continue to Reject Proposal 16-138.
Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs. 2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal. 3. These standards are also covered by a Fine Print Note in 110.12. 4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all the applicable standards. 5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 16-138
Recommendation: The action should be to delete this Fine Print Note.
Substantiation: The addition of these NEC Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. Code Making Panel 16 should consider taking an action to delete this FPN to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as “…a tool to assist untrained electricians to make safer and better installations.” The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP16 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IEW, IAEI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFW and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: Proposal 16-138 pertained to updating the FPN and not to delete it. The comment requests the FPN be deleted. The FPN provides valuable information and the panel intends for it to be retained but the date updated. The references provided in the FPN provide guidance for installation in a neat and workmanship like manner.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Proposal No: 16-136
Recommendation: The panel is encouraged to continue to Reject Proposal 16-138.
Substantiation: The reasons to continue to Reject the Proposal are as follows: 1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs. 2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal. 3. These standards are also covered by a Fine Print Note in 110.12. 4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. If the FPNs are allowed to reference these standards, then they should list all the applicable standards. 5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).
Ballot Results:

Number Eligible to Vote: 15

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-122 Log #1540 NEC-P16

Final Action: Accept

(800.90)


Recommendation: Continue to reject this proposal.

Substantiation: This proposal should continue to be rejected as the existing protection practices employed by the telecommunications utilities have resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement are appropriate and support continued rejection.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-123 Log #1262 NEC-P16

Final Action: Accept

(800.90(A)(1)(b))


Recommendation: Accept the Panel’s action and add a new FPN to 800.90(A)(1): FPN: Section 9 of ANSI C2-2007, National Electrical Safety Code provides an example of methods of protective grounding that can achieve effective grounding of telecommunications cable sheaths for cables from which communications circuits are extended.

Substantiation: CMP 16 rejected the deletion of the term “effectively” in this section because the National Electrical Safety Code uses this term in Section 215(C)(I). This comment proposed a FPN to help explain the meaning of the term “effectively” in this context. Note, that besides NESC, there are other state regulations or utility practices that can also accomplish “effective grounding.” Placement of the FPN is such that it will refer to “effectively grounded” where it appears in both subsections (b) and (e) of 800.90(A)(1).

This Comment was developed by a Task Group assigned by the NEC Technical Correlating Committee to address actions that were other than “accept” taken by Code-Making Panels on proposals from the TCC to resolve 2005 NEC Proposal 5-1 and Comment 5-1. Members of the Task Group on Grounding and Bonding for this Comment included: C. Douglas White; Michael Johnston; Jeffrey Boksiner; Daleep Mohla; Phil Simmons; Christopher Hutchings; James Carroll; Alan Rebeck; Richard Loyd; Paul Dobrowsky; and Neil F. LaBrake, Jr.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-124 Log #245 NEC-P16

Final Action: Accept in Principle

(800.93)

Submitter: Stanley Kaufman, CableSafe Inc.

Recommendation: Accept this proposal in principle by revising 800.93 as shown below:

Requiring any and all cables to be properly supported is not overly restrictive and is appropriate. Securing an additional cable to an existing properly supported cable does not constitute support. Additional cables must be directly supported by the structural members that support the first cable. In such installations, the additional cable is being supported by the same structural member.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-126 Log #1508 NEC-P16

Final Action: Accept

(800.47(B))


Recommendation: Continue to reject this proposal.

Substantiation: Where communications distribution circuits are run under ground and contained within a block so that the likelihood of contact with power conductors or exposure to lightning is minimal, no improvement in safety would be achieved by requiring such circuits to meet the insulation requirements of 800.50(A) and (C).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-127 Log #1260 NEC-P16

Final Action: Accept

(800.47(B))


Recommendation: Continue to reject this proposal.

Substantiation: This proposal should continue to be rejected as the existing protection practices employed by the telecommunications utilities have resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement are appropriate and support continued rejection.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-128 Log #1541 NEC-P16

Final Action: Accept

(800.50(A)(5))


Recommendation: Continue to reject this proposal.

Substantiation: This proposal should continue to be rejected as the existing protection practices employed by the telecommunications utilities have resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement are appropriate and support continued rejection.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-129 Log #1542 NEC-P16

Final Action: Accept

(800.50(A)(5))


Recommendation: Continue to reject this proposal.

Substantiation: This proposal should continue to be rejected as the existing protection practices employed by the telecommunications utilities have resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement are appropriate and support continued rejection.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Proposal No:

16-130 Log #1543 NEC-P16

Final Action: Accept

(800.50(A)(5))


Recommendation: Continue to reject this proposal.

Substantiation: This proposal should continue to be rejected as the existing protection practices employed by the telecommunications utilities have resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement are appropriate and support continued rejection.

Panel Meeting Action: Accept
of the cable shall be either grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment or termination of the cable.

**Substantiation:** The suggested text is an editorial clarification. The text the panel accepted deals with two scenarios, installations where the cable enters the building and installations where the cable is terminated outside of the building. It is clearer to deal with each scenario in a separate sentence. The suggested text retains these options.

This comment includes deletion of the current fine print note because it is no longer needed.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel action and statement on Comment 16-126.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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16-125 Log #257 NEC-P16  Final Action: Accept in Principle (800.93)

**Submitter:** Stanley Kaufman, CableSafe Inc.

**Comment on Proposal No:** 16-158

**Recommendation:** Accept this proposal in principle by revising 800.93 as shown below:

The metallic sheath of communications cables entering buildings shall be grounded as close as practicable to the point of entrance or shall be interrupted as close to the point of entrance as practicable by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of termination of the cable.

**Substantiation:** The suggested text is an editorial clarification. The text the panel accepted deals with two scenarios, installations where the cable enters the building and 2) installations where the cable is terminated outside of the building. It is clearer to deal with each scenario in a separate subsection.

This comment includes deletion of the current fine print note because it is no longer needed.

**Panel Meeting Action:** Accept in Principle

**Panel Statement:** See panel action and statement on Comment 16-126.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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16-127 Log #173 NEC-P16  Final Action: Accept (800.100(A)(6))

**Submitter:** Technical Correlating Committee on National Electrical Code

**Comment on Proposal No:** 16-166

**Recommendation:** It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 16-164. This action will be considered by the Panel as a Public Comment.

**Substantiation:** This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

**Panel Meeting Action:** Accept

**Panel Statement:** The panel has reconsidered this proposal with respect to the panel action on Proposal 16-164. The panel action to ‘accept’ Proposal 16-166 is correct. The panel action to ‘accept’ Proposal 16-164 is incorrect; the panel action should have been “accept in principle” with a panel statement referencing the panel action and statement on Proposal 16-166.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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16-128 Log #174 NEC-P16  Final Action: Accept (800.100(B))

**Submitter:** Technical Correlating Committee on National Electrical Code

**Comment on Proposal No:** 16-167

**Recommendation:** The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the use of the word “and” in the sentence “The grounding conductor shall be connected in accordance with 800.100(B)(1), (B)(2), and (B)(3).”

**Substantiation:** This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

**Panel Meeting Action:** Accept

**Panel Statement:** The panel action should have been “accept in principle” with a panel statement referencing the panel action and statement on Proposal 16-167.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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16-126 Log #1541 NEC-P16  Final Action: Accept (800.93)

**Submitter:** James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

**Comment on Proposal No:** 16-158

**Recommendation:** Accept this proposal in principle by revising 800.93 as shown below:

The metallic sheath of communications cables entering buildings shall be grounded as close as practicable to the point of attachment or shall be interrupted as close to the point of attachment as practicable by an insulating joint or equivalent device.
“(3) In Buildings or Structures Without Intersystem Grounding Bonding Termination or Grounding Means. If the building or structure served has no intersystem grounding bonding termination or grounding means, as described...”

Revise 800.100(B)(3)(2) as follows:
“(2) If the building or structure served has no intersystem grounding bonding termination or has no grounding means, as described in 800.100(B)(2) or...”. Panel Statement: The panel accepts the direction of the TCC to review clarification of the panel action.

The panel has clarified the text on Proposal 16-167 with respect to the word “and” as indicated in the panel action on this comment. It is not the intent to accomplish the grounding connections of 800.100 (B)(1), (B)(2), and (B)(3) simultaneously.

The panel has reconsidered Proposal 16-167 in light of the panel action on Proposal 5-20 as directed by the TCC and has revised “intersystem grounding termination” to “intersystem bonding termination” as indicated in the panel action on this comment.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Proposal No: 16-130
Submitter: Technical Correlating Committee on National Electrical Code
Governing Committee Projects.
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Final Action: Accept

16-130 Log #1528 NEC-P16 Final Action: Accept (800.100(B))

Comment on Proposal No: 16-167
Recommendation: Continue to accept the proposal, but change the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”
Substantiation: This is a correlating comment to correlating with the actions of CMP-5 taken on proposal 5-20 as directed by the TCC. CMP-5 changed the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-128.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-131 Log #1542 NEC-P16 Final Action: Accept (800.100(B))

Comment on Proposal No: 16-171
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.
See panel action and statement on Comment 16-137.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-132 Log #176 NEC-P16 Final Action: Accept (800.110)

Submitter: Technical Correlating Committee on National Electrical Code
Governing Committee Projects.
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Final Action: Accept

16-133 Log #177 NEC-P16 Final Action: Accept (800.110)

Submitter: Technical Correlating Committee on National Electrical Code
Governing Committee Projects.
Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Final Action: Accept

16-134 Log #256 NEC-P16 Final Action: Accept in Principle (800.110)

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-171
Recommendation: Continue to accept this proposal in principle. Accept the correction mentioned in the ballot comments submitted by Messers. Brunssen, Dorna and Kahn.
Substantiation: Acceptance of this comment will correct a typographical error.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 16-137.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-171

Recommendation: The panel action on the Proposal should continue to be Accept in Principle, however, the following additional changes should be made to the panel action:

Revise 800.110 as shown:

800.110 Raceways for Communications Wires and Cables. Where communications wires and cables are installed in a raceway, the raceway shall be either of a type permitted in Chapter 3 and installed in accordance with Chapter 3 or a listed plenum communications raceway listed in accordance with 800.154, and listed nonmetallic communications raceway installed in accordance with 800.154 and a listed nonmetallic raceway complying with 800.182, and installed in accordance with 362.22 through 362.56, where the requirements apply to communications raceways of any kind, including the maximum percentage fill requirements are independent of whether they are electrical or general-purpose communications raceways.

The fill restrictions are already covered in 800.110. The raceway fill restrictions of Chapters 3 and Chapters shall not apply.

Substantiation: The revisions in the first sentence clarify that the listing requirements are specified in 800.182 and the installation requirements in 800.154 and 362.22 should also apply if the requirements for ENT are to be utilized.

Due to familiarity of the Code usage, problems may arise by making the installation requirements for raceways is new material.

Number Eligible to Vote: 15

Ballot Results: Accept

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.


Comment on Proposal No: 16-171

Recommendation: Revise the text of 800.110 Raceways for Communications Wires and Cables as follows:

“…general-purpose communications raceways installed in accordance with 800.154, and a listed nonmetallic raceway complying with 800.182(A), (B), or (C), as applicable, and installed in accordance with 362.24 through 362.56, where …”.

Substantiation: This text is in error and is redundant. Section 800.182 contains the listing requirements for plenum, riser and general-purpose communications raceways.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-171

Recommendation: The panel action on Proposal 16-171 did exactly what the submitter requested.

Substantiation: The panel action was to Hold the Comment only.

Panel Meeting Action: Hold

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: Dan Leaf, Seneca, SC

Comment on Proposal No: 16-174

Recommendation: Accept revised:

Exception: Communication wires and cables shall not be required to comply with raceway fill restrictions specified elsewhere in this Code.

Substantiation: If conduit fill restrictions do not apply, why would the restrictions of 372.11, 374.5, 376.22, 378.22, 384.22, 386.22, 388.22, 390.5, Chapter 9 Tables for Articles 358 and 362 not be covered by the exception?

Panel Meeting Action: Reject

Panel Statement: Raceway fill restrictions are already covered in 800.110. The text as requested by the submitter would be redundant to current text.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-178

Recommendation: The panel action should have been Accept.

Substantiation: The submitter’s substantiation is correct and the panel action on Proposal 16-171 did exactly what the submitter requested.

See definition of “raceway” in Article 100.

Panel Meeting Action: Reject

Panel Statement: Raceway fill restrictions are already covered in 800.110. The text as requested would be redundant with text of 800.110 as modified by the panel action of Proposal 16-171.

Due to familiarity of the Code usage, problems may arise by making the change as requested and would add confusion rather than clarify.

The fill tables of Chapter 9 only apply to conduit and tubing. The fill limitations for other types of raceways are included in Chapter 3. Retaining the exception makes clear that both are covered by 800.110 (text and exception).

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee Correlating directives that the new Exception be written as a complete sentence in accordance with Section 3.1.4.1 of the NEC Style Manual as follows:

“Exception: Communications cables that comply with 800.48 shall not be required to be listed.”

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 16-178

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposals 16-145 and 16-209. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

The panel clarifies that the text of 800.48, 800.113 and the first two paragraphs of 800.179 should be as follows:

800.48. Unlisted Cables Entering Buildings. Unlisted outside plant communications cables shall be permitted to be installed in locations as described in 800.154(C) where the length of the cable within the building measured from its point of entrance, does not exceed 15 m (50 ft) and the cable...
Communications wires and cables shall have a voltage rating of not less than 300 volts. The cable voltage rating shall not be marked on the cable or on the undercarpet communications wire. Communications wires and cables shall have a temperature rating of not less than 60°C. The panel retained the recommended text that states that the minimum temperature rating is 60°C and deleted the recommended text related to temperature marking for cables rated higher than 60°C. If a manufacturer has a higher temperature rating than 60°C, the manufacturer will ordinarily mark the cable to differentiate it.

**Number Eligible to Vote:** 15  
**Ballot Results:** Affirmative: 15

16-142 Log #1957 NEC-P16  
800.133(A)(1)(c) Exception No. 1  
Final Action: Reject

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.

**Comment on Proposal No:** 16-189  
**Recommendation:** Accept the proposal as submitted.

**Substantiation:** The submitter is well aware of the differences between circuit separation as covered in this location and as covered for adjacent snap switches. However, the CMP 9 approach will accommodate CMP 16’s recommendation without disconnecting equipment. See 800.170 for listing requirement for equipment. Panel Meeting Action: Accept in Part

16-143 Log #873 NEC-P16  
800.154  
Final Action: Reject

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

**Comment on Proposal No:** 16-189  
**Recommendation:** The panel is encouraged to continue to Accept Proposal 16-189.

**Substantiation:** The reasons to continue to Accept the Proposal are as follows:  
1. The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.  
2. There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.  
3. These standards are also covered by a Fine Print Note in 110.12.  
4. The FPN should not be accepted because numerous standards and installation manuals exist and to only mention one does not adequately inform the public about accepted industry practices. The NEC is not intended to be an instruction manual for untrained persons. Hence FPNs are allowed to reference these standards, then they should list all applicable standards.  
5. Since the referenced installation standards are intentionally general to cover different models of equipment, approval of the FPN may lead many to believe that these standards can be used instead of listed or labeled manufacturer’s instructions which would be in violation of 110.3(B).  
6. If the CMP would like to include the reference, it should be placed in the Annex with the other references.
The FPN continues to provide useful guidance. Possibilities of misinterpretation are minimized in the 2007 Edition of NFPA 13.

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-144.

Panel Meeting Action: Reject


Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: This comment should have been accepted as this FPN does not provide useful guidance as indicated in the Panel Statement. This FPN which references 8.14.1 of NFPA 13 (2002) Installation of Sprinkler Systems has shown to be problematic and therefore should be deleted as allowed per Standards Council Decision D#06-03. If the FPN were to be deleted this would in effect restore the NEC to the 2002 edition.

The panel statement also included that the 2007 Edition of NFPA 13 would automatically eliminate the possibilities of misinterpretation. There was no opportunity for CMP 16 or the public to review the new proposed edition to see if this would eliminate the possibilities of misinterpretation. The 2007 edition of NFPA 13 also could be in violation of Standards Council Decision D#05-24 to remain status quo on these issues.

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: As informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: This comment should have been accepted as this FPN does not provide useful guidance as indicated in the Panel Statement. This FPN which references 8.14.1 of NFPA 13 (2002) Installation of Sprinkler Systems has shown to be problematic and therefore should be deleted as allowed per Standards Council Decision D#06-03. If the FPN were to be deleted this would in effect restore the NEC to the 2002 edition.

The panel statement also included that the 2007 Edition of NFPA 13 would automatically eliminate the possibilities of misinterpretation. There was no opportunity for CMP 16 or the public to review the new proposed edition to see if this would eliminate the possibilities of misinterpretation. The 2007 edition of NFPA 13 also could be in violation of Standards Council Decision D#05-24 to remain status quo on these issues.

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: This comment should have been accepted as this FPN does not provide useful guidance as indicated in the Panel Statement. This FPN which references 8.14.1 of NFPA 13 (2002) Installation of Sprinkler Systems has shown to be problematic and therefore should be deleted as allowed per Standards Council Decision D#06-03. If the FPN were to be deleted this would in effect restore the NEC to the 2002 edition.

The panel statement also included that the 2007 Edition of NFPA 13 would automatically eliminate the possibilities of misinterpretation. There was no opportunity for CMP 16 or the public to review the new proposed edition to see if this would eliminate the possibilities of misinterpretation. The 2007 edition of NFPA 13 also could be in violation of Standards Council Decision D#05-24 to remain status quo on these issues.

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.
The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 13 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Notes will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.
In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-144.

16-148 Log #747 NEC-P16 Final Action: Reject (800.154, FPN )

Submission: James T. Dollard, Jr., IBEW Local 98

Comment on Proposal No: 16-197

Recommendation: This proposal should be Accepted.

Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 is included for your review. It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:

“If the fine print notes are in any way problematic, they should now be deleted, restating the NFPA 13 and the status quo on plenum cable issues, represented by the 2002 edition of the NEC.”

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:

(1) Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards.

(2) Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations.

(3) Promote Fine Print Notes referencing NFPA 13 in the NEC.

(4) Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required.

(5) Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13.

(6) Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted).

(7) Provide instructions for building officials to threaten and harass building owners to use the proponents products.

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one many “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 13 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Note will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

16-149 Log #748 NEC-P16 Final Action: Reject (800.154, FPN )

Submission: James T. Dollard, Jr., IBEW Local 98

Comment on Proposal No: 16-200

Recommendation: This proposal should be Accepted.

Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 is included for your review. It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:

“If the fine print notes are in any way problematic, they should now be deleted, restating the NEC in this regard to the status quo on plenum cable issues, represented by the 2002 edition of the NEC.”

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:

(1) Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards.

(2) Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations.

(3) Promote Fine Print Notes referencing NFPA 13 in the NEC.

(4) Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required.

(5) Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13.

(6) Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted).

(7) Provide instructions for building officials to threaten and harass building owners to use the proponents products.

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one many “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 13 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Note will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.
A.8.14.1.2 Minor quantities of combustible materials such as but not limited to:

8.14.1.2.1 Concealed Spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. The NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.
8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)
8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: nonmetallic plumbing piping, non-structural wood, etc...can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

$\text{CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC, therefore, it can and should be deleted.}$

Panel Meeting Action: Reject
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanations of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.
OHDE, H.: See my Explanation of Negative for Comment 16-144.
impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction? As an example, an AHJ Massachusetts would not provide a certificate of occupancy where there is not a marketing influence, within the concealed space.

**NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard.** 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1) 8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The protection shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc...can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined. In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC, therefore, it can and should be deleted. **Panel Meeting Action: Reject**

Panel Statement: The FPN continues to provide useful guidance. Possibilities of misinterpretation are minimized in the 2007 Edition of NFPA 13. **Number Eligible to Vote: 15** **Ballot Results: Affirmative: 12 Negative: 3**

**Explanation of Negative:**

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: See my Explanation of Negative for Comment 16-144.

**Report on Comments A2007 — Copyright, NFPA**

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**Comment on Proposal No:**

**Submitter:** Harold C. Ohde, BBEW-NECA Technical Institute

**Comment on Proposal No:** 16-200

**Recommendation:** This proposal should be accepted.

**Substantiation:** This FPN should be deleted as the submitter proposed. In the submitter’s substantiation, he states that this FPN has misled the AHJ to believe and enforce limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

**NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard.** 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1) 8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The protection shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc...can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined. In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC, therefore, it can and should be deleted. **Panel Meeting Action: Reject**

Panel Statement: The FPN continues to provide useful guidance. Possibilities of misinterpretation are minimized in the 2007 Edition of NFPA 13. **Number Eligible to Vote: 15** **Ballot Results: Affirmative: 12 Negative: 3**

**Explanation of Negative:**

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN. JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: See my Explanation of Negative for Comment 16-144.
To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers” (see 8.14.1.1). The threshold value at which sprinklers become necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat. If bundles of unsheathed computer wiring are installed above the ceiling or beneath the floor in a manner where fire propagation in all directions is likely, then the concealed space should be treated the same as a combustible space, thereby requiring appropriate sprinkler protection.

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage, which represents 24,000 installers, designers and manufacturers, feels that this last minute interjection of a FPN was not sufficiently vetted to industry and that the TCC should review this matter.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the Concealed Spaces.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-144.

16-155 Log #1785 NEC-P16 Final Action: Reject
(800.154(A))

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-197
Recommendation: Accept proposal to delete Fine Print Note

Substantiation: The Standards Council issued two decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address Code Making Panel (CMP) decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.

The later decision states, in pertinent part, as follows: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).” The decision also states: “nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. Proposals to the fine print notes will be considered and rejected by the CMP in consideration of its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is clearly open for further consideration and action during the Comment phase.”

This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at http://www.dupont.com/cablingsolutions/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of NEC, the FPN misled the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces.

To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers” (see 8.14.1.1). The threshold value at which sprinklers become necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat. If bundles of unsheathed computer wiring are installed above the ceiling or beneath the floor in a manner where fire propagation in all directions is likely, then the concealed space should be treated the same as a combustible space, thereby requiring appropriate sprinkler protection.

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage. BICSI, which represents 24,000 installers, designers and manufacturers, feels that this last minute interjection of a FPN was not sufficiently vetted to industry and that the TCC should review this matter.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-144.

16-156 Log #1787 NEC-P16 Final Action: Reject
(800.154(A))

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-200
Recommendation: Accept proposal to delete Fine Print Note

Substantiation: The Standards Council issued two decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address Code Making Panel (CMP) decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.

The later decision states, in pertinent part, as follows: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).” The decision also states: “nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. Proposals to the fine print notes will be considered and rejected by the CMP in consideration of its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is clearly open for further consideration and action during the Comment phase.”

This FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of “limited combustible cable” (one such example is found at http://www.dupont.com/cablingsolutions/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met the requirements of NEC, the FPN misled the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities
communications installer in which clarification was given that the CMP cable was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The installation of the CMP cable was allowed.

To further the response of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers (see 8.14.1.1). The intent that was fixed at value in which sprinklers are not necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat. If bundles of unshielded cloth wiring are installed above the ceiling or beneath the floor in a manner where fire propagation in all directions is likely, then the concealed space should be treated the same as a combustible space, thereby requiring appropriate sprinkler protection.”

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage. BICSI, which represents 24,000 installers, designers and manufacturers, feels that this last minute introduction of a FPN was not sufficient to be vetted to industry and that the NEC should review this matter. Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: JENSEN, B. (A). This FPN as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: See my Explanation of Negative for Comment 16-144.

16-157 Log #179 NEC-P16 (800.154(A) and (B))

Submitter: Technical Correlating Committee on National Electrical Code Comment on Proposal No: 16-199

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal and that further consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

The panel accepts the direction of the TCC to clarify the panel action.

The panel action on Proposal 16-199 should have read, “The panel accepts (A) Plenum. Cables installed in ducts, plenums, and other spaces used for air as described in 300.22(C). Only Type CMP cable shall be permitted to be installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Type CMP cable shall be permitted to be installed in raceways.


Substantiation: This is one of three references to NFPA 13 (it is repeated identically in articles 770, 800 and 820) included in the code that is a meaningless reference. Other references to NFPA 13, in Article 362, are properly included in mandatory sections of the code (section 362.10).

Whenever a jurisdiction adopts NFPA 13 they need to address it for mandatory sections and not for an unenforceable FPN in one section, which is intended to mislead the user. In fact, NFPA 13 does not require that sprinklers be installed in plenums of “noncombustible or limited combustible construction”, even if “the usual amount of cabling” is present. In fact, there have been several documented examples where the Fire Protection Association that has jurisdiction have been told that this means that sprinklers are required in plenum areas unless “limited combustible cable” is installed. I have been personally involved in several cases, and have heard of many more cases where this is being stated.

Section 8.14.1 of NFPA 13 (2006) reads as follows:

8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc. can be processed in concealed spaces of limited or concealed spaces of limited access but should not typically be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The thermostat value at which sprinklers become necessary in the concealed space is not defined.

The same change is being proposed to the corresponding Fine Print Notes in articles 770 and 820, all of which deal with the same type of cables.

The committee rejected the proposal based on, and I quote: “NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

“[S]o as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.”

However, Standards Council has since issued two new decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address CMP decisions on Fine Print Notes referencing NFPA 13. These decisions are in pertinent part, as follows: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.” These decision states, in pertinent part, as follows: “if the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).”

The decision also states: “nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the comment and voting phase of the code development process. The NEC Project is considering whether the fine print notes should be in the NEC is hardly new. Aside from the fact that their presence was debated in the previous edition cycle, Proposals to remove them were duly filed and rejected by the responsible Code-Making Panel based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is, therefore, clearly open for further consideration and action during the Comment phase.”

Thus, clearly these Standards Council decisions directly permit the deletion of the Fine Print Note addressed by this comment. Technically this Fine Print Note needs to be deleted for two reasons:

1. This Fine Print Note is misleading by pointing the reader to NFPA 13 which does not require the use of sprinklers, as both Bob Jensen and Harry Odhe point out in their negative votes and as is shown by the sections of NFPA 13 reproduced above.
2. This Fine Print Note is identical to the ones in 770.154 (A) and in 820.154 (A), both of which are equally misleading. On the other hand there are no Fine Print Notes in articles 725 and 760. Thus, deleting this Fine Print Note will provide further consistency within the NEC.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: See my Explanation of Negative for Comment 16-144.

16-159 Log #956 NEC-P16 Final Action: Reject (800.154(A), FPN )

Submitter: Donald Hall, Corning Cable Systems

Comment on Proposal No: 16-167

Recommendation: Note: The commenter is also submitting analogous comments to Proposal 16-78 (ROP Log #3099) and Proposal 16-329 (ROP Log #3095) pertaining to FPNs referencing NFPA 13 Section 8.14.1 Accept the proposal to delete the FPN, leading to the following:

770.154 Application of Listed Communications Wires and Cables and Communications Raceways. Communications wires and cables shall comply with any of the requirements of 800.154(A) through 800.154(F) or where cable substitutions are made in accordance with 800.154(G).

(A) Plenum. Cables installed in ducts, plenums, and other spaces used for environmental air shall not be permitted to remain. Types CMP, CPR, CMG, CM and CMX cables installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in plenums and ducts as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only type CMP cable shall be permitted to be installed in these raceways.


Substantiation: The committee rejected this proposal without any consideration of its merits, based on its belief at the time that it fell within the scope of Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005. Since that time, however, the Standards Council has issued two new decisions as follows: Decision 06-06 (SC #6-3-18) dated 22 March 2006 states in pertinent part: “The Council, after due consideration, believes that clarification of this Panel Action is needed.”

Decision 06-19 (SC #06-7-33) dated 28 July 2006 states, in pertinent part: “The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC Project would not violate the directive by deleting the Fine Print Notes as issue.”

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 800 as described in 300.22(C) are not type CMP cable shall be permitted to be installed in these raceways.

16-160 Log #238 NEC-P16 Final Action: Reject (800.154(B))

Submitter: Stanley Kaufman, CableSafe Inc.

Comment on Proposal No: 16-187

Recommendation: Accept this proposal in principle. Continue to accept the recommendation in proposal 16-187. In addition make the following change:

800.154(B)(2) Metal Raceways or Fireproof Shafts. Listed communications cables shall be permitted to be enclosed in a metal raceway or in a fireproof shaft having fire-stops at each floor.

Substantiation: The purpose of proposal 18-187 is to establish parallelism between sections 770.154, 800.154 and 820.154. 770.154(B)(2) Type OFG, OFN, OFCG, and OFC cables shall be permitted to be enclosed in a metal raceway or located in a fireproof shaft having fire-stops at each floor. 800.154(B)(2) Metal Raceways or Fireproof Shafts. Listed communications cables shall be permitted to be enclosed in a metal raceway or located in a fireproof shaft having fire-stops at each floor. 820.154(B)(2) Metal Raceways or Fireproof Shafts. Types CATV and CATVX cables shall be permitted to be enclosed in a metal raceway or located in a fireproof shaft having fire-stops at each floor. 830.154(C)(2) Metal Raceways or Fireproof Shafts. Type BLX cables shall be permitted to be enclosed in a metal raceway or located in a fireproof shaft having fire-stops at each floor.

The words “shall be permitted” were omitted from the text in 800.154(B)(2). Acceptance of this comment will correct that typographical error.

Panel Meeting Action: Reject

Panel Statement: The submitter intended to establish parallelism between Sections 16-187, however, upon careful scrutiny of the text, it appears that greater clarity can be achieved by rejection of the comment.

If the language of the comment is accepted, cables could be installed without protection. The submitter is encouraged to submit a new proposal.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Report on Comments A2007 — Copyright, NFPA NFPA 70

70-545
16-162 Log #2052 NEC-P16 Final Action: Accept
(800.154(G), FPN)
Submitter: Harold C. Ohde, IBEW #134
Comment on Proposal No: 16-206
Recommendation: Continue to Reject.
Substantiation: The submitter’s recommendation to create a new cable designation (CMP50) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s recommendation to add this FPN to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials to believe, install and enforce that limited combustible, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13, Section 8.14.1. The submitter’s substantiation references 2002 NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?
NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows: 8.14.1.2 Concealed Spaces Not Requiring Sprinkler Protection.
8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1). 8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc. can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.
In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 16 rejected this proposal based on the Standards Council decision D(05-24 to remain “status quo” on issues that pertain to NFPA 90A.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-163 Log #1462 NEC-P16 Final Action: Reject
(800.154(H) (New))
Submitter: Sanford Egesdal, Egesdal Associates PLC
Comment on Proposal No: 16-188
Recommendation: Reconsider Proposal 16-188 and revise 800.154 as shown below:

(H) Communications Fire Hazard (FHC) Cable. Communications Fire hazard (FHC) cable shall be permitted for use in communications systems as other wiring within buildings in accordance with 800.154(E) to provide reduced potential heat release.

Substantiation: The application of the Standards Council’s decision on NFPA 90A was an error. The proposed marking on the cable did not include a “P” added to CM. Type CMP cable is permitted to be installed in plenums. This comment creates a new section for the fire hazard cable. The new section provides a requirement that clearly identifies that the fire hazard cable is permitted to be installed as “Other Wiring Within Buildings.”

To better clarify that the Standards Council’s decision on NFPA does not apply and to better clarify where the cable is permitted to be installed, the marking on the cable is changed to Type CM-FHC. The “FHC” suffix stands for fire hazard cable. There is a companion comment to revise the marking found in my comment to Proposal 16-223.

Some installations require large amounts of cable. A typical application of a fire hazard cable would be above a suspended ceiling or under a raised floor, neither of which is a plenum. The proposed cable has a very low fuel load, as compared to other types of cable insulation. Some cable constructions use one type of insulation on the conductor and another type for the jacket. The Type CM-FHC cable suggested for marking and marking in 800.179(K) (comment to proposal 16-223) has parameters (e.g. 3500 BTU/lb) that are standard in the building industry, and useful to system designers and fire protection engineers.

To put cable insulation heat release in perspective, here are relative values:
Fire Hazard Cable insulation: less than 8 MJ/kg (3,500 BTU/lb)
PVC insulation: As high as 25 MJ/kg (11,000 BTU/lb)
Polyolefin insulation: As high as 46 MJ/kg (20,000 BTU/lb)

Panel Meeting Action: Reject
Panel Statement: Cable meeting specifications as described in this comment is not prohibited by the Code, and the panel sees no need for an additional marking.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-165 Log #1514 NEC-P16 Final Action: Reject
(800.156)
Submitter: James H. Maxfield, Dover, NH
Comment on Proposal No: 16-207
Recommendation: Delete the following text:
800.156 Dwelling Unit Communications Outlet. For new construction, a minimum of two communications outlet shall be installed; one within the master bedroom and one within the living room or kitchen, and cabled to the service provider demarcation point.

Substantiation: This proposal appears to be a matter of design convenience. The resident of a dwelling unit may elect to subscribe to a land line communication provider. They may choose a wireless system. The addition of this section does not appear to be in harmony with Section 90.1 (170), NEC, 2005 edition. The addition of this proposal does not appear to solve any problem while mandating communication services and location of services which may not be desired.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 16-164. Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-166 Log #2100 NEC-P16 Final Action: Reject
(800.156)
Submitter: James H. Maxfield, Dover, NH
Comment on Proposal No: 16-207
Recommendation: Delete the following text:
800.156 Dwelling Unit Communications Outlet. For new construction, a minimum of two communications outlet shall be installed; one within the master bedroom and one within the living room or kitchen, and cabled to the service provider demarcation point.

Substantiation: This proposal appears to be a matter of design convenience. The resident of a dwelling unit may elect to subscribe to a land line communication provider. They may choose a wireless system. The addition of this section does not appear to be in harmony with Section 90.1 (170), NEC, 2005 edition. The addition of this proposal does not appear to solve any problem while mandating communication services and location of services which may not be desired.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 16-164. Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-166 Log #2277 NEC-P16 Final Action: Reject
(800.179(A))
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-211
Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:
FPN: One method of determining that the cable has fire-resistant and low-smoke-producing characteristics is NFPA 262-2002, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”
FPN: One method of determining that the cable is resistant to the spread of fire is ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Another method of determining that the cable is resistant to the spread of fire is the “Vertical Flame Test - Cables in Cable Trays,” in CSA C22.2 No. 0.3-M-2001, Test Methods for Electrical Wires and Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

The date of the latest edition of the UL standard was corrected from 1991 to 2001 and for the CSA standard from 1985 to 2001.

Panel Meeting Action: Hold
Panel Statement: The proposal was editorial, seeking no changes to the fine print note. A technical change in the fine print note would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-171 Log #2282 NEC-P16 Final Action: Hold (800.179(D), 800.179(I) and 800.179(J) FPNs, )

TPC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.
Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-217
Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in UL1685-2000 Standard for Safety for Vertical-Tray Fire-Protection and Smoke-Release Test for Electrical and Optical-Fiber Cables.

Another method of determining that the cable is resistant to the spread of fire is the “Vertical Flame Test - Cables in Cable Trays,” in CSA C22.2 No. 0.3-M-2001, Test Methods for Electrical Wires and Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold
Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-172 Log #2283 NEC-P16 Final Action: Hold (800.179(F))

TPC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.
Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-219
Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to flame spread is the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The FPN as submitted in the Proposal includes mandatory language by requiring that the cable be tested to UL 1581. The revised wording provides explanatory information without any requirements.

The date of the latest edition of the UL standard was corrected from 1991 to 2001.

Panel Meeting Action: Hold
Panel Statement: The proposal was editorial, seeking no changes to the fine print note. A technical change in the fine print note would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-173 Log #370 NEC-P16 Final Action: Accept (800.179(G))

Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA
Comment on Proposal No: 16-220
Recommendation: Accept the Proposal in Principle and refer to Proposal 16-221 and Comment submitted by S.D. Kahn.

Substantiation: It is questionable whether the Standards Council directives apply to this Proposal. The Standards Council directive was to maintain the status quo with respect to plenum cables; this Proposal does not alter that status quo. The original Substantiation is correct and the Proposal is essentially editorial in that multipurpose cables are no longer recognized. Listing requirements for multipurpose cables were only permitted until July 1, 2003.

70-547
16-174 Log #371 NEC-P16 Final Action: Accept (800.179(G))

Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA

Comment on Proposal No: 16-221

Recommendation: Accept the Proposal.

Substantiation: It is questionable whether the Standards Council directives apply to this Proposal. The Standards Council directive was to maintain the status quo with respect to plenum cables; this Proposal does not alter that status quo. The original Substantiation is correct and the Proposal is essentially editorial in that multipurpose cables are no longer recognized. Listing requirements for multipurpose cables were only permitted until July 1, 2003.

If section 800.179(G) remains in the Code there will be no new multipurpose cable listings. If proposal 16-221 is accepted there still will not be any new multipurpose cable listings, but we will have a better code. Since the outcome is the same, i.e., no multipurpose cable listings regardless of whether or not this proposal is accepted, it should be clear that accepting the proposal does not violate the Standards Council directive to maintain the status quo relative to plenum cables. The status quo is that there have been no new multipurpose cable listings since July 1, 2003.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-175 Log #2284 NEC-P16 Final Action: Hold (800.179(G))

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-221

Recommendation: The Panel Action should have been to Accept in Principle in Part by accepting and rewording the FPNs in the sections indicated to read as shown below. The balance of the Proposal should be Rejected in accordance with the Panel Statement.


(H) – FPN: One method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in UL1685-2000 Standard for Safety for Tests for Fire Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.

Another method of determining that the cable is resistant to the spread of fire is the “Vertical Flame Test - Cables in Cable Trays,” in CSA C22.2 No. 0.3-M-2001, Test Methods for Electrical Wires and Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

The number, title, and the date of the latest edition of the UL standard were corrected to reflect the current applicable standard. The reference in the CSA standard and the date of the CSA standard were also corrected.

Panel Meeting Action: Hold

Panel Statement: The proposed revision(s) constitutes new material that has not had the benefit of public review and so cannot be considered at this stage of the code-making cycle. Refer to Section 4.4.6.2.2 of the Regulations Governing Committee Projects.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-176 Log #2285 NEC-P16 Final Action: Hold (800.179(J))

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-222

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in UL1685-2000 Standard for Safety for Vertical-Fray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.

Another method of determining that the cable is resistant to the spread of fire is the “Vertical Flame Test - Cables in Cable Trays,” in CSA C22.2 No. 0.3-M-2001, Test Methods for Electrical Wires and Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

The number, title, and the date of the latest edition of the UL standard were corrected to reflect the current applicable standard. The reference in the CSA standard and the date of the CSA standard were also corrected.

Panel Meeting Action: Hold

Panel Statement: The proposal was editorial, seeking no changes to the fine print note. A technical change in the fine print note would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15
ARTICLE 810 — RADIO AND TELEVISION EQUIPMENT

810.54 Exception as follows:
“Exception: Where the lead-in conductors are enclosed in a continuous metallic shield that is grounded with a conductor in accordance with 810.58, they shall not be required to comply with these requirements. Where grounded, the metallic shield shall also be permitted to be used as a conductor.”

Revise 810.57 Exception Nos. 1 and 2 as follows:
“Exception No. 1: Where the lead-in is protected by a continuous metallic shield that is grounded with a conductor in accordance with 810.58, an antenna discharge unit or other suitable means shall not be required.”

“Exception No. 2: Where the antenna is grounded with a conductor in accordance with 810.58, an antenna discharge unit or other suitable means shall not be required.”

Panel Meeting Action: Accept
Mounting on a non-conductive surface (such as wood or vinyl siding, etc.) that is exposed to a potential lightning strike should be grounded. The physical separation between the dish and supporting metalwork and the coaxial conductors is of little significance when it comes to lightning.

Mounting on a non-conductive surface (such as wood or vinyl siding, roofing) does not preclude arcing and flash-over to other conductive media in the structure (plumbing, electrical and communications wiring) and the accompanying fire hazard.

### 16-182 Log #776 NEC-P16

**Final Action:** Reject

**Comment on Proposal No:** 16-230

**Recommendation:** Add new text to read as follows:

810.15 Grounding. Masts and metal structures supporting antennas shall be grounded in accordance with 810.21.

Exception: In installations where dish antennas are one point two (1.2) meters or less in diameter, and the masts and metal structures supporting antennas are not electrically connected to lead-in conductors and are mounted to a non conductive surface material, grounding of the mast or supporting metal structure is not required.

**Substantiation:** Problem: Since the satellite antenna and mast are electrically isolated from the power source they pose no threat of becoming a ground source for lightning or electrical surge.

Substantiation: During the installation process on dishes that are 1.2 meters in diameter or less, when the mast and/or metal mounting plate is mounted on a non-conductive surface such as wood or brick the dish is effectively isolated from the power source. In addition, all other electrical components are electrically isolated from the mast and antenna. This design (if left ungrounded) provides no conduit for high voltage electrical current to enter the residence.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Reject

**Ballot Results:** Affirmative: 15

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Note: Supporting material is available for review at NFPA Headquarters.

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### 16-184 Log #780 NEC-P16

**Final Action:** Reject

**Comment on Proposal No:** 16-230

**Recommendation:** Add new text to read as follows:

810.15 Grounding. Masts and metal structures supporting antennas shall be grounded in accordance with 810.21.

Exception: In installations where masts and metal structures supporting antennas are not electrically connected to lead-in conductors and are mounted to a non-conductive surface material, grounding of the mast or supporting metal structure is not required.

**Substantiation:** Problem: The type of satellite antenna and mast used in residential installations are electrically isolated from the power source. Therefore, grounding these components to current code creates a potential ground source for lightning or electrical surge.

Substantiation: During the installation process on dishes that are 1.2 meters in diameter or less, when the mast and/or metal mounting plate is mounted on a non-conductive surface such as wood or brick the dish is effectively isolated from the power source. In addition, all other electrical components are electrically isolated from the mast and antenna. This design (if left ungrounded) provides no conduit for high voltage electrical current to enter the residence.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Reject

**Comment on Proposal No:** 16-230

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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### 16-185 Log #1134 NEC-P16

**Final Action:** Reject

**Comment on Proposal No:** 16-230

**Recommendation:** Insert:

810.15 Exception (New)  
Exception: In installations where dish antennas are one point two (1.2) meters or less in diameter and all lead in conductors are electrically isolated from the dish.

Substantiation: This will help prevent the introduction of voltage to the receiver due to lightning strikes reducing the chance of damage to the receiver that is located in the premises.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel action and statement on Comment 16-182.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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### 16-186 Log #1391 NEC-P16

**Final Action:** Reject

**Comment on Proposal No:** 16-230

**Recommendation:** Revise text to read as follows:

810.15 Grounding. Masts and metal structures supporting antennas shall be grounded in accordance with 810.21.

Exception: In installations where masts and metal structures supporting antennas are not electrically connected to lead-in conductors and are mounted to a non-conductive surface material, grounding of the mast or supporting metal structure is not required.

Substantiation: Problem: Since the satellite antenna and mast are electrically isolated from the power source they pose no threat of becoming a ground source for lightning or surges until they are grounded to current code.

Substantiation: If the mast or metal supporting structure is mounted on a non-conductive surface and all electrical components are electrically isolated from the mast and antenna there is no path for high voltage and current to enter the structure.

Note: Supporting material is available for review at NFPA Headquarters.

**Panel Meeting Action:** Reject

**Panel Statement:** See panel action and statement on Comment 16-182.

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 15

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### 16-187 Log #182 NEC-P16

**Final Action:** Accept

**Comment on Proposal No:** 16-236

**Recommendation:** It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 5-20. This action will be considered by the Panel as a Public Comment.

**Substantiation:** This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Revise the text of 810.21(F) as follows:
“(F) Electrode. The grounding conductor shall be connected as follows:
(1) In Buildings or Structures with an Intersystem Bonding Termination. If the building or structure served has an intersystem grounding bonding termination, the grounding conductor shall be connected to the nearest accessible location on the following:

Retain existing list and text:
“(3) In Buildings or Structures Without Intersystem Bonding Termination or Grounding Means. If the building or structure served has no intersystem grounding bonding termination, the grounding conductor shall be connected to the nearest accessible location on the following:”

Panel Statement: The panel has reconsidered this proposal per the TCC comment and has revised the text as indicated to correlate with the panel action on Proposal 5-20.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-188 Log #183 NEC-P16 Final Action: Accept (810.21(F))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-237
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 16-236. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Relocate the text to follow 810.21(F)(2)(f) and revise as follows:
“A bonding device intended to provide a termination point for the grounding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on non-removable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is non-removable.”

Panel Statement: The panel has reconsidered Proposal 16-188 and has also considered the affirmative comment expressed in the voting. The panel has determined that the proper location of the text is 810.21(F)(2)(f), not 810.21(F)(e), as indicated in the affirmative comment. That is, where equipment (service) enclosures are discussed. The panel has also added editorial clarification as indicated in the panel action on this comment. The panel notes that the text is presently located incorrectly in the preprint.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-189 Log #1111 NEC-P16 Final Action: Reject (810.21(F))
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-236
Recommendation: The Panel action should be to Accept in Principle with the following additional revisions to the Proposal:
Change “has no” to “does not have a” in 810.21(F)(2), 810.21(F)(3), and 810.21(F)(3)(b).
Substantiation: This is a grammatical change that makes the sentences read better and does not change any of the requirements.

Panel Meeting Action: Reject
Panel Statement: The requirements are clear as presented and are not improved by the submitter’s suggested editorial revision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-190 Log #1527 NEC-P16 Final Action: Accept (810.21(F))
Comment on Proposal No: 16-236
Recommendation: Continue to accept the proposal, but change the term “Intersystem Bonding Termination” to “Intersystem Bonding Termination,”
Substantiation: This is a correlating comment to correlating with the actions of CMP-5 taken on proposal 5-20 as directed by the TCC. CMP-5 changed the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-187.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

ARTICLE 820 — COMMUNITY ANTENNA TELEVISION AND RADIO DISTRIBUTION SYSTEMS

16-191 Log #252 NEC-P16 Final Action: Accept in Part (820.2)
Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-250
Recommendation: Accept this proposal in principle in part by continuing to accept/excise modification to the definition of the point of entrance and rejection the addition of the fine print notes. Add the following additional definitions:
Intermediate Metal Conduit (Type IMC). The definition in 342.2 shall apply.
Rigid Metal Conduit (Type RMC). The definition in 342.4 shall apply.
Substantiation: Article 820 uses the terms Intermediate Metal Conduit and Rigid Metal Conduit. These terms are defined in Notes 342g and 344 respectively. Because of 90.3 (excepted below), these definitions do not apply to Chapter 8. They will apply if this comment is accepted.

“Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.”

Panel Meeting Action: Accept in Part
Delete FPNs No. 1 and No. 2.

Panel Statement: The panel accepts the deletion of the FPNs and rejects the addition of the two definitions, as they are covered by references to Chapter 3 within 820.110.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-192 Log #253 NEC-P16 Final Action: Reject (820.2)

Panel Meeting Action: Reject
Panel Statement: The panel rejects Proposal 16-245. The panel intends to delete the definition. The listing requirements for CATV Raceway are in section 820.182. It is appropriate to have a definition in this article.

Substantiation: The listing requirements for CATV Raceway are in section 820.182. They will apply if this comment is accepted.

Panel Meeting Action: Reject
Panel Statement: The panel rejects Proposal 16-245. The panel intends to delete the definition. The listing requirements for CATV Raceways are in section 800.182.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-193 Log #663 NEC-P16 Final Action: Reject (820.2)
Comment on Proposal No: 16-252
Recommendation: Delete text to read as follows:
“802.2 Air Duct. A conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilating equipment, but not including the provisions of NFPA 90A.”

Substantiation: The term “air duct” is not contained in Article 820 and should not, thus, be defined in the Article.

The same change is being proposed for the definition of “air duct” in article 800.

The committee rejected the proposal based on, and I quote: “NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:
“[S]o as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.”

However, Standards Council has since issued two new decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address CMP decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits the NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154.

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-187.
The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue. The later decision states, in pertinent part, as follows: “if the fine print notes are not a helpful reference to NEC Article 820, then perhaps an additional clarification is needed. However, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not others (Articles 725 and 760).” The decision also states: “nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. The question whether the fine print notes should be in the NEC is hardly new. Aside from the fact that their presence was debated in the previous edition cycle, Proposals to remove them were duly filed and rejected by the responsible Code-Making Panel based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is, therefore, clearly open for further consideration and action during the Comment phase.” It would appear to me that these Standards Council decisions by implication would indirectly permit the deletion of definitions that violate the NEC manual of style.

Panel Meeting Action: Reject
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision. Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2
Explanation of Negative:
JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.
We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.
We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.

ODHE, H.: This comment should have been accepted as this is no need for this definition of “air duct”. The term “air duct” is not contained in this Article therefore should not be defined.
The panel meeting reflects that Standards Council decision relative to NFPA 90A Decision is remain status quo regarding plenum issues. I do not believe that the Standards Council decision would prohibit the definition of air duct from being deleted.

16-195 Log #1582 NEC-P16 Final Action: Reject (820.2)

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-243
Recommendation: This proposal should be accepted.
Substantiation: The term “air duct” is not used in Article 800 and, therefore, it should be deleted from 800.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to “air duct”. I do not believe that this Standards Council decision would prohibit the definition of “air duct” from being deleted. I do believe that expansion of, or a new definition of, air duct in another Article would be a violation of Standards Council Decision D#05-24. Standards Council recently issued another decision (D#06-03) which decided that 770.154(A) FPN, 800.154(A) FPN and 820.154(A) FPN may be deleted and this deletion would not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision. Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2
Explanation of Negative:
JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.
We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.
We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.

We believe that the interpretation of whether being allowed to address the Standards Council recently issued another decision (D#06-03) which decided that 770.154(A) FPN, 800.154(A) FPN and 820.154(A) FPN may be deleted and this deletion would not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject

Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:
JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.

We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.

We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.


16-198 Log #1788 NEC-P16 Final Action: Accept
(820.2)

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-247

Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to add this definition to 820.2 because the term “concealed space” is used 820.154(A) FPN is misleading. This definition does not belong in the NEC. The 820.154(A) FPN provided no guidance to designers, installers or code officials. This FPN has misled the designer, installer and code officials to believe, install and enforce what constitutes a concealed space even with small openings such as those used as return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1) A.8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1* Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1.1) For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, to a typical office building due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.


16-199 Log #1789 NEC-P16 Final Action: Reject
(820.2)

Submitter: Robert W. Jensen, dbi

Comment on Proposal No: 16-239

Recommendation: Accept this proposal.

080.2 Air Duct: A conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilating equipment, but not including the plenum.

Substantiation: This was an apparent over-sight in the 2005 editorial review under the Standards Council mandate to remove content related to “air duct cable”, therefore under not the NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005.

Additionally, “Air duct” is not a term used in Article 820 and therefore a violation of the NFPA Manual of Style.

Panel Meeting Action: Reject

Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:
JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.

We believe that the interpretation of whether being allowed to address the original proposal in view of the NFPA Standards Council Long Decision 05-24 (SC #05-7-4) was wrong. Indeed, during the writing of the 2005 NEC, all references where 90A issues were involved were to be untouched in the 2005 NEC. One of these issues was “air duct cable” and the definition of “air duct” (as it pertained to air duct cable). Additionally, having a definition where the term is not used in the text of the code is in violation of the Style Guide.

We agree with deleting the term “air duct” as it was evidently an oversight that it was not removed during the last code cycle. Air duct was introduced for use with “air duct cable” which was not to be used in the 2005 code. Additionally, the term is not used within 800. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.

16-202 Log #1116 NEC-P16 Final Action: Accept in Part (820.2, Point of Entrance)

Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-251
Recommendation: The Panel Action should continue to be Accept in Principle with the following additional revisions to the Panel Action.

In the definition for Point of Entrance, delete the last phrase “connected by a grounding conductor to an electrode in accordance with 820.100(B)” because it is an integral and necessary part of the definition. See panel action and statement on Comment 16-87.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-204 Log #1230 NEC-P16 Final Action: Accept in Part (820.3(A))

Submitter: John Burke, Fusion Cable Systems
Comment on Proposal No: 16-256
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal regarding what is meant by “reorder subsections of 820.3." This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-202 Log #1116 NEC-P16 Final Action: Accept in Part (820.2, Point of Entrance)

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-252
Recommendation: Accept this proposal.

800.2 Air Duct: A conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilating equipment, but not including the plenum. [NFPA 70: 2007, 3.1.6.5]

Substantiation: This was an apparent oversight in the 2005 editorial review under the Standards Council mandate to remove content related to “air duct cable”, therefore not under the NEC Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005.

Additionally, “air duct” is not a term used in Article 820 and therefore a violation of the NFPA Manual of Style.

Panel Meeting Action: Reject

Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative: JENSEN, R.: We disagree that there was no opportunity for public review. To the contrary, there were nineteen (19) comments received on proposals involving this definition, thereby showing that this proposal was indeed reviewed.

We believe that the interpretation of whether being allowed to address the OHDE, H.: See my Explanation of Negative for Comment 16-193.

JENSEN, R.: We disagree that there was no opportunity for public review. To further not using this term, in proposal 16-29, the panel revised the proposal to not use “air duct”, but instead to harmonize code language by using the term “ventilation or air handling ducts”.


16-203 Log #184 NEC-P16 Final Action: Accept (820.3(A))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-256
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 16-257. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Reject

Panel Statement: The panel has reconsidered the panel action on Proposal 16-256 and determines that it is correct and correlates with the panel action on Proposal 16-257. The panel desires to relocate the text on abandoned cable removal to a more appropriate section as indicated in the panel statement for Proposal 16-257. The panel did not intend to delete the text.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-201 Log #1114 NEC-P16 Final Action: Accept in Part (820.2, Point of Entrance)

Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-250
Recommendation: The Panel Action should continue to be Accept in Principle with the following additional revisions to the Panel Action.

In the definition for Point of Entrance, delete the last phrase in the Proposal “grounded to an electrode in accordance with 820.100(B)” because it is an integral and necessary part of the definition. See panel action and statement on Comment 16-87.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to review clarification of the panel action.

The panel accepted the deletion of 800.3(A), which was moved to 820.26. Hence, the remaining subsections of 820.3 had to be reordered, i.e., (B) becomes (A), (C) becomes (B), etc.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-206 Log #186 NEC-P16 Final Action: Accept
(820.3(A), 820.25 (new) & 820.26 (new))

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-260
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

See panel action and statement on Comment 16-207.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-207 Log #187 NEC-P16 Final Action: Accept
(820.3(A), 820.25 (new) & 820.26 (new))

TCC Action: The Technical Correlating Committee understands that 820.3(C) should not be deleted.
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-261
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

The action corrects a typographical error.

The substantiation for the change to 300.21 is in Proposal 16-259.

The panel took parallel action in Articles 770, 800, and 830.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-208 Log #2058 NEC-P16 Final Action: Reject
(820.3(A), 820.25, and 820.26)

Submitter: Harold C. Ohde, IBEW #134
Comment on Proposal No: 16-260
Recommendation: This Proposal should have been Rejected.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Reject
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

This Proposal should have been Rejected.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with minimal limited combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1.4 of NFPA 13 has been revised to read as follows:
8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection
8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).
16-210 Log #188 NEC-P16  Final Action: Accept  (820.24)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-273
Recommendation: The Technical Correlating Committee notes that neither the panel statement nor the revised statement shown in the affirmative vote are responsive to the submitter’s substantiation for the recommendation. The Technical Correlating Committee directs the panel to act on the merits of the recommendation. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting and continues to reject the proposal. The requirements of 300.11(C) are applicable to CATV cables, are not overly restrictive and are appropriate.
Requiring any and all cables to be properly supported is not overly restrictive and is appropriate. Securing an additional cable to an existing properly supported cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative:
BRUNSSEN, J.: Proposal 16-273 should have been accepted. See my explanation of negative vote on Comment 16-216.

16-211 Log #189 NEC-P16  Final Action: Accept  (820.24)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-274
Recommendation: The Technical Correlating Committee notes that neither the panel statement nor the revised statement shown in the affirmative vote are responsive to the submitter’s substantiation for the recommendation. The Technical Correlating Committee directs the panel to act on the merits of the recommendation. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting and continues to reject the proposal. The requirements of 300.11 are applicable to CATV cables, are not overly restrictive and are appropriate.
Requiring any and all cables to be properly supported is not overly restrictive and is appropriate. Securing an additional cable to an existing properly supported cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative:
BRUNSSEN, J.: Proposal 16-273 should have been accepted. See my explanation of negative vote on Comment 16-216.

16-212 Log #374 NEC-P16  Final Action: Reject  (820.24)

Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA
Comment on Proposal No: 16-272
Recommendation: Reject the Proposal.
Substantiation: Although I agree with the proposal and the submitter’s intent to introduce consistency, the material is used in plenums and other air handling spaces. Consequently, the proposal should have been subject to the direction given by the Standards Council, as were many other proposals which were rejected.
The investigation of these products includes consideration of the rated strength and the addition of the FPN are as follows:

**Substantiation:**

- Adding a requirement that all hardware be "listed" is far from editorial as asserted in the substantiation accompanying the proposal. The panel is asked to consider the long-standing practices of CMP-7 and CMP-8 that do not require support hardware to be "listed". Above all else, consistency in the NEC seems to be what the original submitter values most. No substantiation has been provided in the proposal that would differentiate treatment of antenna television and radio distribution cables from other wiring systems with respect to supporting the various types of hardware that are listed. These cables are subject to supporting cables and wire raceways are called upon to provide both primary support required in the NEC and very often secondary support or wire management functions. All hardware need not be held to the highest standard.

The comment provided by Mr. Dorna with his negative vote references two UL categories under which cable ties and other hardware are "listed": the correct UL category for hardware for Support of Conduit, Tubing and Cable (UL 2239) is DWMU, not DWFY. Nevertheless, this standard and UL 1565, Positioning Devices (ZODZ) establishes a 23 kg test load for all support products for flexible conduits and cables in accordance with the requirements for primary support throughout the NEC. For cable ties, "minimum tensile strength" is commonly marked on packages. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The proposed new text will add value to inspectors in acceptance of appropriate cable ties without requiring lists.

Companion proposals have been submitted for 640.6, 725.8, 760.8, 770.24, 800.24 and 830.24.

**Panel Meeting Action:** Reject

**Panel Statement:** There is more to listing than mechanical strength. Also, the mechanical strength should be based on the use and ratings of the device. Cable ties can be used for securing and supporting cables in a number of Chapter 3 wiring methods without any requirements for a minimum loop tensile strength of 23 kg (50 lbs) or any particular strength. For example, Section 334.30 covering securing and supporting of "nonmetallic-sheathed cable requires supporting and securing by staples, cable ties, straps, hangers, or similar fittings designed and installed so as not to damage the cable, at intervals not exceeding 1.4 m (4 1/2 ft) and within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting." Notice it does not have any recommendation for the support strength, nor does it need this additional marking or special consideration. The cables may not be providing any support at all where the tie wrap is simply anchoring it to a beam or joist. Types AC and MC cable also give permission to use cable ties for securing and supporting these cables in 320.30 and 330.30, respectively. In addition, this added text could be considered to be new information that has not been reviewed as part of the process.

Listing includes an evaluation of the particular device that goes beyond the ability to support cable. The guide information for ZODZ, Wire Positioning Devices states that:

"The testing of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance and weatherability characteristics as appropriate for the product."

These are all characteristics that we should be concerned about for electrical installations.

- Listed devices are evaluated using UL1565; Standard for Positioning Devices. The scope of this standard states:

  "1.1 This standard applies to metallic and nonmetallic devices used for positioning - which may include bundling and securing - or to a limited extent supporting cable, wire, conduit, or tubing of a wiring system in electrical installations, to reduce the risk of fire, electric shock, or injury to persons."

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 12 Negative: 3

**Explanation of Negative:**

- BOYER, J.: See my explanation of vote on Comment 16-29.

- The trend by the CMPs over the last several code cycles has been to limit the use of FPNs.
- There is also a correlation issue. There is a conflict between those panels that accepted the proposal and those that rejected the proposal.

16-214 Log #1547 NEC-P16

**Final Action:** Reject

16-216 Log #1544 NEC-P16

**Final Action:** Reject

16-217 Log #1545 NEC-P16

**Final Action:** Reject

16-215 Log #874 NEC-P16

**Final Action:** Reject

16-215 Log #874 NEC-P16

**Final Action:** Reject

16-216 Log #1544 NEC-P16

**Final Action:** Reject

16-217 Log #1545 NEC-P16

**Final Action:** Reject

**Submitter:** Timothy P. McNeive, Thomas & Betts Corporation

**Comment on Proposal No:** 16-275

**Recommendation:** Accept the panel action but delete the requirement that hardware be "listed" in 820.24. Add the following sentence before the last sentence in 820.24:

"Cable ties that provide primary support for optical fiber cables and raceways shall have a minimum loop tensile strength of 23 kg (50 lbs)."

**Substantiation:**

- The comment provided by Mr. Dorna with his negative vote references two UL categories under which cable ties and other hardware are "listed". The correct UL category for hardware for Support of Conduit, Tubing and Cable (UL 2239) is DWMU, not DWFY. Nevertheless, this standard and UL 1565, Positioning Devices (ZODZ) establishes a 23 kg test load for all support products for flexible conduits and cables in accordance with the requirements for primary support throughout the NEC. For cable ties, "minimum loop tensile strength" is commonly marked on packages. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239, Hardware for Support of Conduit, Tubing and Cable. The proposed new text will add value to inspectors in acceptance of appropriate cable ties without requiring lists.

Companion proposals have been submitted for 640.6, 725.8, 760.8, 770.24, 800.24 and 830.24.

**Panel Meeting Action:** Reject

**Panel Statement:** There is more to listing than mechanical strength. Also, the mechanical strength should be based on the use and ratings of the device. Cable ties can be used for securing and supporting cables in a number of Chapter 3 wiring methods without any requirements for a minimum loop tensile strength of 23 kg (50 lbs) or any particular strength. For example, Section 334.30 covering securing and supporting of "nonmetallic-sheathed cable requires supporting and securing by staples, cable ties, straps, hangers, or similar fittings designed and installed so as not to damage the cable, at intervals not exceeding 1.4 m (4 1/2 ft) and within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting." Notice it does not have any recommendation for the support strength, nor does it need this additional marking or special consideration. The cables may not be providing any support at all where the tie wrap is simply anchoring it to a beam or joist. Types AC and MC cable also give permission to use cable ties for securing and supporting these cables in 320.30 and 330.30, respectively. In addition, this added text could be considered to be new information that has not been reviewed as part of the process.

Listing includes an evaluation of the particular device that goes beyond the ability to support cable. The guide information for ZODZ, Wire Positioning Devices states that:

"The testing of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance and weatherability characteristics as appropriate for the product."

These are all characteristics that we should be concerned about for electrical installations.

- Listed devices are evaluated using UL1565; Standard for Positioning Devices. The scope of this standard states:

  "1.1 This standard applies to metallic and nonmetallic devices used for positioning - which may include bundling and securing - or to a limited extent supporting cable, wire, conduit, or tubing of a wiring system in electrical installations, to reduce the risk of fire, electric shock, or injury to persons."

**Number Eligible to Vote:** 15

**Ballot Results:** Affirmative: 12 Negative: 3

**Explanation of Negative:**

- BOYER, J.: See my explanation of vote on Comment 16-29.
assemblies that are heavier and larger than communications cables, operate at
much greater power levels (CATV cables often contain no power), and present
a greater risk of injury if not properly installed. If the Panel continues to reject
Proposal 16-274 then, at the very least, 300.11(C) should be excepted. See my
preliminary on Proposal on 16-273. Panel Meeting Action: Reject
Panel Statement: Securing an additional cable to an existing cable does
not constitute support. Additional cables must be directly supported by the
same structural member that supports the first cable. In such installations, the
additional cable is being supported by the same structural member.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
BRUNSON, J.: This comment should have been accepted, as should the
original Proposal 16-274. Lashing (tie-wrapping) of additional CATV coaxial
cables to existing CATV coaxial cables is accepted industry practice, and has
been done extensively without detriment to safety. The CATV coaxial cables
are of small diameter, light in weight and operate at very low voltage, current
and power levels. The argument is not one of whether to support the
additional CATV coaxial cable, but the adequacy of lashing (tie-wrapping) to
existing CATV coaxial cables(s). For further substantiation, see my explanation
of negative on Proposal 16-274 and my substantiation to Comment 16-217.
Additionally, the final sentence of the panel statement is unclear.
JOHNSON, S.: See my explanation of negative vote on Comment 16-31.
JONES, R.: See my Explanation of Negative Vote on Comment 16-216.

16-219 Log #715 NEC-P16 (820.24) Final Action: Reject

Submitter: Noël Williams, Herriman, UT
Comment on Proposal No: 16-272
Recommendation: This proposal should have been accepted without
modification by the panel.
Substantiation: Cable ties of different types, materials, and configurations are
widely used without problems and probably fall under the existing language
“or similar fittings,” so they would still continue to be used even if the proposal were
rejected. However, much of the hardware that was already specifically
permitted are not even available as listed products. For example, most straps,
staples, and “hangers” are not listed products. Entire lines of one-hole and two-
hole straps, standoff brackets, ring hangers, and the strut-type hardware used
for all types of even the most heavy electrical wiring methods are not listed.
The requirement should rest on the basic requirement that all such materials be
acceptable to the authority having jurisdiction (approved). The proposed
wording in the Explanation of Negative by Mr. Boyer would also be usable, as
there is a listing standard for the cable ties and this language, since it refers to
primary support, would not restrict the use of cable ties that are used only for
cable management. The language accepted by the panel would eliminate most
of the products currently in use by this industry, without any evidence being
provided of a problem with those products.
Panel Meeting Action: Reject
Panel Statement: The guide information for ZODZ, Wire Positioning Devices
states that:
“The investigation of these products includes consideration of the rated
mechanical strength, maximum operating temperature, smoke and heat
generation, corrosion resistance and weatherability characteristics as
appropriate for the product.”
These are all characteristics that we should be concerned about for electrical
installations.
Listed devices are evaluated using UL1565 – Standard for Positioning
Devices. The scope of this standard states:
“1.1 This standard applies to those metallic and nonmetallic devices used for
positioning - which may include bundling and securing - or to a limited extent
supporting cable, wire, conduit, or tubing of a wiring system in electrical
installations, to reduce the risk of fire, electric shock, or injury to persons.”
The evaluation of positioning devices includes:
• Classification by mechanical strength, material, maximum temperature, and
environmental conditions
• Required Markings giving critical information to the installer / inspector
• Mechanical strength tests
• Flammability classification of polymeric materials and coatings (NOT air-
handling space requirements)
• Relative thermal index
• Material requirements (Including blending and substitution)
• Corrosion resistance
• Sharp edges
• Installation
• Mechanical strength
• Vibration
• Tests for mounting blocks and other mounting hardware and devices
Environmental conditioning....

16-220 Log #775 NEC-P16 (820.24, FPN) Final Action: Reject

Submitter: John P. Masarick, Independent Electrical Contractors Inc.
Comment on Proposal No: 16-276
Recommendation: The panel is encouraged to continue to Reject Proposal 16-
276
Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the
use of FPNs.
2. There is also a correlation issue. There is a conflict between those panels
that accepted the proposal and those that rejected the proposal.
3. These standards are also covered by a Fine Print Note in 110.12.
4. The FPN should not be accepted because numerous standards and
installation manuals exist and to only mention one does not adequately inform
the public about accepted industry practices. The NEC is not intended to be an
instruction manual for untrained persons. If the FPNs are allowed to reference
these standards, then they should list all applicable standards.
5. Since the referenced installation standards are intentionally general to
cover different models of equipment, approval of the FPN may lead many to
believe these standards can be used instead of listed or labeled manufacturer’s
instructions which would be in violation of 110.3(B).
6. If the CMP would like to include the reference, it should be placed in the
Annex with the other references.
Panel Meeting Action: Reject
Panel Statement: The comment substantiation is inconsistent with the
recommended action. The panel does not agree to delete the FPN. The panel
did not delete that FPN, as the original proposal was to update the reference
date.
See panel action and statement on Comment 16-107a (Log #CC1602).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative:
PREZIOSO, L.: See my explanation of affirmative vote on Comment 16-34.
4. The FPN should not be accepted because numerous standards and grounded, no other protective devices shall be required.

Coaxial cables entering buildings or attaching to buildings shall comply within the premises shall be permitted.

The outer conductive shield of the coaxial cable shall be grounded at the 820.93 Grounding of the Outer Conductive Shield of Coaxial Cables.

FPN: Selecting a grounding location to achieve the shortest practicable grounding conductor helps limit potential differences between CATV and other metallic systems.

(A) Entering Buildings. In installations where the coaxial cable enters the building, the outer conductive shield shall be grounded as close as practicable to the point of entrance.

(B) Terminating Outside of the Building. In installations where the coaxial cable is terminated outside of the building, the outer conductive shield shall be grounded as close as practicable to the point of attachment or termination.

(C) Mobile Homes. For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

FPN: Selecting a grounding location to achieve the shortest practicable grounding conductor helps limit potential differences between CATV and other metallic systems.

Move the current 820.93(B) to 820.100 and renumber it to be 820.100(E).

Substantiation: The suggested text is an editorial clarification intended to bring this section into compliance with section 3.3.1(2) of the NEC Style Manual which states:

2. Use simple declarative sentence structure, and keep sentences short.

Writing rules in long sentences full of commas, dependent clauses, and parenthetical expressions often creates confusion and misunderstanding. The requirement can be written in two or more short sentences, expressed using a list or table, or both.

The existing paragraph deals with three scenarios, 1) installations where the cable enters the building, 2) installations where the cable is terminated outside of the building and 3) cables serving mobile homes. It is clearer to deal with each scenario in a separate subsection. The suggested text retains these options. The current 820.93(A) is merged into the opening paragraph of the recommended text. The current 820.93(B) should be moved to 820.100(E).

The changes accepted in proposal 16-287 are incorporated into (C).

Panel Meeting Action: Accept in Principle

Move the current 820.93(B) to 820.100 and renumber it to 820.100(E). Review 820.93 to read as follows:

"820.93 Grounding of the Outer Conductive Shield of Coaxial Cables. Coaxial cables entering buildings or attached to buildings shall comply with (A) or (B). Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required. For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section."

FPN: Selecting a grounding location to achieve the shortest practicable grounding conductor helps limit potential differences between CATV and other metallic systems.

(A) Entering Buildings. In installations where the coaxial cable enters the building, the outer conductive shield shall be grounded in accordance with 820.100. The grounding shall be as close as practicable to the point of entrance.

(B) Terminating Outside of the Building. In installations where the coaxial cable is terminated outside of the building, the outer conductive shield shall be grounded in accordance with 820.100. The grounding shall be as close as practicable to the point of attachment or termination.

Panel Statement: This revised text achieves the submitter’s purpose with improved clarity and achieves parallelism with the text the panel accepted in Comments 16-40 and 16-126. Section 820.93(B) Shield Protection Devices in Part III Protection is moved to 820.100. Cable Grounding in Part IV Grounding Methods because a shield protection device is a grounding method.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

(TCC Action: The Technical Correlating Committee directs that this comment be reported as “Accept” to correlate with the action taken on Comment 16-223.

Submitter: Stanley Kaufman, CableSafe Inc.

Comment on Proposal No: 16-286

Accept this proposal in principle by revising 820.93 and 820.100 as shown below.

820.93 Grounding of Outer Conductive Shield of a Coaxial Cable. The outer conductive shield of the coaxial cable shall be grounded at the building premises as close to the point of cable entrance or attachment as practicable.

For purposes of this section, grounding located at mobile home service equipment located in sight from, and not more than 9.0 m (30 ft) from, the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located in sight from and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.

FPN: Selecting a grounding location to achieve the shortest practicable grounding conductor helps limit potential differences between CATV and other metallic systems.

(A) Shield Guarding. Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required.

(B) Shield Protection Devices. Grounding of a coaxial drop cable shield by means of a protective device that does not interrupt the grounding system within the premises shall be permitted.

820.93 Grounding of Outer Conductive Shield of Coaxial Cables. Coaxial cables entering buildings or attaching to buildings shall comply with (A), (B) or (C). Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required.
Submitter: Technical Correlating Committee on National Electrical Code on Proposal No: 16-289
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. The first sentence in new (C) references compliance with (B)(1) and there is not a (B)(1). This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The Panel accepts the direction of the TCC to review clarification of the panel action.
The panel was in error to include the first sentence of (C). It refers back to (B)(1) of the text which was not accepted by the panel. Hence, the first sentence should be deleted, and the text identified with (1) should be identified as (C) Location.
See panel action and statement on Comment 16-227.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Submitter: Technical Correlating Committee on National Electrical Code on Proposal No: 16-290
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. The first sentence in new (C) references compliance with (B)(1) and there is not a (B)(1). This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The Panel accepts the direction of the TCC to review clarification of the panel action.
The panel is unable to make a change as it was a rejected Proposal. The panel rejected Proposal 16-290 as the submitter neither provided text for the new section nor justification for the proposed new requirements.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

TCC Action: The Technical Correlating Committee directs that 820.93(C) be revised to correct an error in the panel action as follows: “820.93(C) Location. Where installed, a listed primary protector shall be applied on each community antenna and radio distribution the CATV cable external to the premises. The listed primary protector shall be located as close as practicable to the entrance point of the cable on either side or integral to the ground block.”
Comment on Proposal No: 16-289
Recommendation: Correct the panel action text as indicated.
Substantiation: The panel action was to reject the part of the proposal requiring a primary protector. The added text was intended to indicate the location where the protector was to be installed, when optionally used. Therefore, the word “required” is incorrect and should be replaced with the word “installed.”
Panel Meeting Action: Accept in Principle
Revise 820.93(C) as follows:
(C) Location. Where a listed primary protector shall be applied on each community antenna and radio distribution the CATV cable external to the premises. The listed primary protector should be located as close as practicable to the entrance point of the cable on either side or integral to the ground block.
Panel Statement: The panel agrees with the submitter’s comment but revised the text as shown in the panel action to correlate with similar text in 820.93(D) (of the draft).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Submitter: George Bish, Mastec
Comment on Proposal No: 16-302
Recommendation: Insert: (8) the noncurrent carrying metal parts of cord and plug connected equipment, if grounded per 250.138(A) or (B).
Substantiation: This would allow for a coaxial cable to use the receiver as a ground point.
Panel Meeting Action: Reject
Panel Statement: Grounding protects insulation in the equipment and reduces electric shock hazards.
These comments should be rejected even if limited only to satellite dish installations on the basis that where grounding is required a cord connected product ground is a poor substitute for a more permanent grounding method.
• The receptacle itself may not be grounded properly (Many older buildings, especially those built before the 1960’s, were not even required to have branch circuit equipment grounding provisions).
• If a grounded receptacle is not be available a “cheater” plug may be used with no ground connection
• If the equipment is unplugged you lose the ground
• The equipment may be replaced by a non-grounded piece of equipment
These comments are considered by the Panel as a Public Comment.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-228.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-230 Log #461 NEC-P16 Final Action: Reject
(820.100(A)(3))
Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 16-296
Recommendation: Accept in Part the proposed revision to (A)(3), second sentence.
Substantiation: Present wording is vague and subjective; proposed wording is specific.
Panel Meeting Action: Reject
Panel Statement: The panel has reviewed and affirms their panel action on Proposal 16-296. The present wording ensures that the grounding conductor will be no smaller than AWG # 14 and is consistent with similar requirements in 800.100(A)(3) and 830.100(A)(3).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-231 Log #193 NEC-P16 Final Action: Accept
(820.100(B))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-299
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the use of the word “and” in the sentence “The grounding conductor shall be connected in accordance with 820.100(B)(1), (B)(2), and (B)(3).” This action will be considered by the Panel as a Public Comment.
Panel Meeting Action: Accept
Revise 820.100(B) as follows:
“(B) Electrode. The grounding conductor shall be connected in accordance with 820.100(B)(1), (B)(2), and (B)(3).”
Revise 820.100(B)(1) as follows:
“(1) In Buildings or Structures with an Intersystem Bonding Grounding Termination. If the building or structure served has an intersystem grounding bonding termination, the grounding conductor shall be connected to the intersystem grounding bonding termination.”
Revise 820.100(B)(2) as follows:
“(2) In Buildings or Structures with Grounding Means. If the building or structure served has no intersystem grounding bonding termination, the grounding conductor shall be connected to the nearest accessible location on the building or structure.”
Panel Meeting Action: Accept
Revise 820.100(B)(3) as follows:
“(3) In Buildings or Structures Without Intersystem Bonding Grounding Termination or Grounding Means. If the building or structure served has no intersystem grounding bonding termination or grounding means, as described, as follows:
Revise 820.100(B)(3)(2) as follows:
“(2) If the building or structure served has no intersystem grounding bonding termination or has no grounding means, as described in 800.100(B)(2) or…”
Panel Statement: The panel accepts the action of the TCC to clarify the panel action.
The panel has clarified the panel action on Proposal 16-299 with respect to the word “and” as indicated in the panel action on this comment. It is not the intent to accomplish the grounding connections of 820.100 (B)(1), (B)(2), and (B)(3) simultaneously.
The panel has reconsidered Proposal 16-299 in light of the panel action on Proposal 5-20 as directed by the TCC and has revised “intersystem grounding termination” to “intersystem bonding termination” as indicated in the panel action on this comment.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Revise the text to follow 820.100(B)(2)(7) and revise as follows:
“A bonding device intended to provide a termination point for the grounding conductor (intersystem bonding shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on non-removable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is non-removable.”
Panel Statement: The panel accepts the direction of the TCC to review clarification of the panel action.
The panel action on Proposal 16-300 to accept in principle is correct. The panel has reviewed the comments expressed in the voting and determined that the proper location of the text is 820.100(B)(2)(7), not 820.100(B)(5), as indicated in the comment. That is where equipment (service) enclosures are discussed. The panel has also added editorial clarification as indicated in the panel action on this comment. The panel notes that the text is presently located incorrectly in the preprint.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-233 Log #685 NEC-P16 Final Action: Accept in Part
(820.100(B))
Submitter: James M. Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-299
Recommendation: The Proposal should be Accepted in Principle by incorporating the following changes:
In 820.100(B), change “and” to “or” so it reads: “...with 820.100(B)(1), (B)(2), or (B)(3).”
Change “has no” to “does not have an” in 820.100(B)(2), (B)(3), and (B)(3)(2)
Revise 820.100(B)(3)(2) as follows:
“If the building or structure served has no intersystem grounding bonding termination of grounding means, as described in 820.100(B)(5), or if none of the individual electrodes listed in (B)(3)(1) exist, to any one of the individual electrodes described in 250.52(A)(5), (A)(6), and (A)(7),”
Substantiation: While the 2005 Code erroneously contains the word “and” in reference to two conditions, the installation can only comply with one of the three conditions so “or” is appropriate. This change will also address the first part of the TCC Action.
The text revision is editorial.
The deleted phrase in 820.100(B)(3)(2) is identical to the first phrase in 820.100(B)(3) so it has already been determined that the condition exists. The revised text now states that if the individual electrodes in (B)(3)(1) exist, one of them must be used. If none of those electrodes exist, then the individual electrodes in (B)(3)(2) must be used. The change from “and” to “or” is appropriate since there is a choice between the three electrodes. This change is for editorial clarity and was not intended to change any of the requirements. If the revision to 820.100(B)(3)(2) is accepted, then the editorial text revision to that section is no longer necessary.
Panel Meeting Action: Accept in Part
Revise “and” to “or” in 820.100(B). Panel Statement: The panel has accepted the part to revise “and” to “or” in 820.100(B). See panel action and statement on Comment 16-231. The panel accepts the editorial revisions to 820.100(B)(3)(2).
The panel rejects the portion of the comment to revise “has no” to “does not have an” in 820.100(B)(2), (B)(3), and (B)(3)(2). The text is clear as written. See panel action and statement on Comments 16-17 and 16-189.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-234 Log #1526 NEC-P16 Final Action: Accept
(820.100(B))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-300
Recommendation: Continue to accept the proposal, but change the term “Intersystem Bonding Termination” to “Intersystem Bonding Termination.”
Substantiation: This is a correlating comment to correlating with the actions of CMP-5 taken on proposal 5-20 as directed by the TCC. CMP-5 changed the term “Intersystem Bonding Termination” to “Intersystem Bonding Termination.”
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-231.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-235 Log #1526 NEC-P16 Final Action: Accept
(820.100(B))
Comment on Proposal No: 16-299
Recommendation: Continue to accept the proposal, but change the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”
Substantiation: This is a correlating comment to correlating with the actions of CMP-5 taken on proposal 5-20 as directed by the TCC. CMP-5 changed the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-231.
16-235 Log #1547 NEC-P16  Final Action: Accept (820.100(B))
Comment on Proposal No: 16-299
Recommendation: Revise the text of 820.100(B) as follows:
“(B) Electrode. The grounding conductor shall be connected in accordance with 820.100(B)(1) and (B)(2).”
Substantiation: “The present text is incorrect as 820.100(B) refers to three individual requirements that are appropriate under three separate circumstances. They are not to be done simultaneously. Hence, “and” should be replaced by “or”.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-231.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-236 Log #1546 NEC-P16  Final Action: Accept (820.100(B)(2)(7))
Comment on Proposal No: 16-4
Recommendation: Add new text to read as follows:
“820.100 Cable Grounding.
(B) Electrode. The grounding conductor shall be connected in accordance with 820.100(B)(1) and (B)(2).
1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:
(a) The building or structure grounding electrode system as covered in 250.50
(b) The grounded interior metal water piping system, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52
(c) The service equipment enclosure
(d) The metallic power service raceway
(e) The non-current-carrying metal parts of cord-and-plug-connected equipment, if grounded as covered in 250.138(A) or (B)
(f) The metallic power service raceway
(g) The non-current-carrying metal parts of cord-and-plug-connected equipment, if grounded as covered in 250.138(A) or (B)
(h) The non-current-carrying metal parts of cord-and-plug-connected equipment, if grounded as covered in 250.138(A) or (B)
(i) The ground connection listed in 250.138 is substantial enough to protect the equipment and the occupants of the building, the manner of grounding proposed above should also be considered an acceptable ground.
2) The grounded interior metal water piping system, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52
3) The power service accessible means external to enclosures as covered in 250.94
4) The metallic power service raceway
5) The service equipment enclosure
6) The grounding electrode conductor or the grounding electrode conductor metal enclosure, or
7) The grounding conductor or the grounding electrode of a building or structure disconnecting means that is grounded to an electrode as covered in 250.30.32
8) The non-current-carrying metal parts of cord-and-plug-connected equipment, if grounded as covered in 250.138(A) or (B)
250.138 Cord-and-Plug-Connected Equipment. Non-current-carrying metal parts of cord-and-plug-connected equipment, if grounded, shall be grounded by one of the methods in 250.138(A) or (B).
(A) By Means of an Equipment Grounding Conductor. By means of an equipment grounding conductor run with the power supply conductors in a cable assembly or flexible cord properly terminated in a grounding-type attachment plug with one fixed grounding contact.
The ground connection listed in 250.138 is substantial enough to protect the equipment and the occupants of the building, the manner of grounding proposed above should also be considered an acceptable ground.

Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-228.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-237 Log #775 NEC-P16  Final Action: Reject (820.100(B)(8) (New))
Submitter: David Lettkeman, Dish Network Service, LLC
Comment on Proposal No: 16-302
Recommendation: Add new text to read as follows:
820.100 Cable Grounding.
(B) Electrode. The grounding conductor shall be connected in accordance with 820.100(B)(1) and (B)(2).
1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:
(a) The building or structure grounding electrode system as covered in 250.50
(b) The grounded interior metal water piping system, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52
2) The ground connection listed in 250.138 is substantial enough to protect the equipment and the occupants of the building, the manner of grounding proposed above should also be considered an acceptable ground.
Substantiation: The ground connection listed in 250.138 is substantial enough to protect the equipment and the occupants of the building, the manner of grounding proposed above should also be considered an acceptable ground.

Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-228.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-239 Log #195 NEC-P16  Final Action: Accept (820.106(A))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-305
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlate with the action on Proposal 16-4 based on text in the affirmative comments. This action will be considered by the Panel as a Public Comment.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider and correlate with the action on Proposal 16-4.
Proposal 16-305 was accepted in principle, as the appropriate revisions were to have been made in Proposal 16-4. They were not. The text of 820.106(A)(1) and (2) in the preprint is incorrect with respect to Proposals 16-4 and 16-305. See the panel action on Comment 16-3.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-240 Log #1549 NEC-P16  Final Action: Accept (820.106(A))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-306
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlate with the action on Proposal 16-4 based on text in the affirmative comments. This action will be considered by the Panel as a Public Comment.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-228.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-243 Log #779 NEC-P16  Final Action: Accept (820.106(A))
Submitter: Steve C. Hill, Satellite Broadcast and Communications Association
Comment on Proposal No: 16-302
Recommendation: Add new text to read as follows:
820.100 Cable Grounding.
(B) Electrode. The grounding conductor shall be connected in accordance with 820.100(B)(1) and (B)(2).
1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:
(a) The building or structure grounding electrode system as covered in 250.50
(b) The grounded interior metal water piping system, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52
(c) The service equipment enclosure
(d) The metallic power service raceway
(e) The service equipment enclosure
(f) The ground connection listed in 250.138 is substantial enough to protect the equipment and the occupants of the building, the manner of grounding proposed above should also be considered an acceptable ground.
Substantiation: The ground connection listed in 250.138 is substantial enough to protect the equipment and the occupants of the building, the manner of grounding proposed above should also be considered an acceptable ground.

Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-228.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-249 Log #1546 NEC-P16  Final Action: Accept (820.106(A))
Comment on Proposal No: 16-307
Recommendation: Revise the text of 820.106(A) in the ROP draft of the 2008 NEC is incorrect per Proposal 16-305.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-3.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-250 Log #1547 NEC-P16  Final Action: Accept (820.106(A))
Comment on Proposal No: 16-308
Recommendation: Revise the text of 820.106(A) in the ROP draft of the 2008 NEC is incorrect per Proposal 16-305.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-3.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
The Technical Correlating Committee directs that Fine Print Note No.1 be deleted since it is more than explanatory, and that Fine Print Note No. 2 also be deleted to be consistent with the Technical Correlating Committee action on Comment 16-41.

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 16-309
Recommendation: It was the action of the Technical Correlating Committee that the proposal be reconsidered with the action on Proposal 16-284. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Governing Committee Projects.

Panel Meeting Action: Accept

The panel clarifies that the text of 820.48 and 820.113, and the first paragraph of 820.179 should be as follows:

"Unlisted outside plant coaxial cables shall be permitted to be installed in locations as described in 820.154(C) where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated at a grounding block."

FPN No. 1: This section limits the length of unlisted outside plant cable to 15 m (50 ft), while 820.93 requires that the outer conductive shield of the coaxial cable be grounded at the building premises as close to the point of cable entrance or attachment as practicable. Therefore the outside plant coaxial cable may not be permitted to extend 15 m (50 ft) into the building if it is practicable to ground the outer conductive shield closer than 15 m (50 ft) to the entrance point.

FPN No. 2: See 820.2 for the definition of Point of Entrance.

820.113 Installation of Coaxial Cables. Coaxial cables installed in buildings shall be listed.

Exception: As permitted in 820.48.

820.179 Coaxial Cables. Coaxial cables shall be listed in accordance with 820.179(A) through 820.179(D) and marked in accordance with Table 820.179. The cable voltage rating shall not be marked on the cable.

FPN: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for the use requiring Class Electric light, and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

Panel Statement: The panel accepts the direction of the TCC to reconsider and correlate with the action on Proposal 16-284.

The panel also correlated the text with Proposal 16-319 renumbering. Section 820.113 has been revised to establish parallelism with 770.113.

Number Eligible to Vote: 15
Final Action: Hold
Ballot Results: Affirmative: 15

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The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-309
Recommendation: The Panel action should have been to Accept in Part by not accepting the FPN to 820.179.

Substantiation: The FPN is not necessary since the reason for not marking the voltage rating on the cable is obvious. There are numerous other instances in the Code where similar requirements to the last sentence in 820.179 are included and there are no explanatory FPNs included with them.

Panel Meeting Action: Hold
Panel Statement: Proposal 16-309 is an editorial proposal that relocated the cable marking requirements from 820.113 to 820.179. The FPN is not new text; it is relocated text. Deleting it would be a concept that has not had public review.

The proposed revision(s) constitutes new material that had not had the benefit of public review and cannot be considered at this stage of the code-making cycle. Refer to 4.4.6.2.2 of the Regulations Governing Committee Projects.

See panel action and statement on Comment 16-26.

Number Eligible to Vote: 15
Final Action: Reject
Ballot Results: Affirmative: 15

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The Technical Correlating Committee understands that the new Exception should be written as a comment in accordance with the Section 3.1.4.1 of the NEC Style Manual as follows:

"Exception: Coaxial cables that comply with 800.48 shall not be required to be listed."


Comment on Proposal No: 16-306
Recommendation: The revision in the first sentence clarifies that the listing requirements are specified in 820.182 and the installation requirements in 820.154. These revisions will also provide consistency with 770.110 and 800.110. 362.22 should also apply if the requirements for ENT are to be utilized. Using the term “listed CATV raceways” will still permit the installation of CATV coaxial cables in CATV raceways (plenum, riser, or general-purpose) or in any type of listed raceway permitted in Chapter 3 without adding additional text to the Code. This revision will also permit the installation of other types of listed CATV coaxial cables and CATV raceways that may be included in future Code without having to revise 820.110.

The Exception should have been deleted rather than including it as positive text in the last sentence. The first sentence in 820.110 already states “installed in accordance with Chapter 3” which would include all of Chapter 3 requirements pertaining to raceways including the maximum percentage fill limitations in Chapter 9. The Proposal and the panel action perpetuates conflicting requirements between that sentence and the Exception.

No substantiation was submitted to support the deletion of the conduit fill restrictions of Chapters 3 and 9. The fill restrictions are based on the physical limitations of being able to pull conductors or cables into raceways without damaging the conductors or cables, particularly when there are bends in the run, and to avoid conductor/cable jamming. The maximum percentage fill requirements are independent of whether they are electrical conductors or not; they could be empty tubes. The maximum percentage fill requirements in Chapters 3 and 9 are an integral part of the permitted uses of the raceways contained in Chapter 3 and if CATV cables are to be installed in a Chapter 3 raceway, then the maximum percentage fill requirements must also apply.

Panel Meeting Action: Hold
Panel Statement: Changing the installation requirements for raceways is new material.

The proposed revision(s) constitutes new material that has not had the benefit of public review and cannot be considered at this stage of the code-making cycle. Refer to 4.4.6.2.2 of the Regulations Governing Committee Projects.

See panel action and statement on Comment 16-26.

Number Eligible to Vote: 15
Final Action: Accept
Ballot Results: Affirmative: 15

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The Technical Correlating Committee directs that the new Exception should be written as a comment in accordance with the Section 3.1.4.1 of the NEC Style Manual as follows:

"Exception: Coaxial cables that comply with 800.48 shall not be required to be listed."
Identified" is not the same as "listed" which means that some sort of mandatory language. This comment will bring the cable substitution figures into compliance with the style manual by making the cable substitution figures part of the mandatory text.

The panel action on Proposal 16-322 should have read, "The panel accepts the submitter’s deletion in subsection (B) and (D)."

Recommendation:
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-322
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.
The panel action on Proposal 16-322 should have read, “The panel accepts the submitter’s deletion in subsection (B) and (D).”
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-247 Log #924 NEC-P16 Final Action: Accept in Principle (820.154)
Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-319
Recommendation: Accept this proposal in principle.
(E) Cable Substitutions. The uses and permitted substitutions for CATV coaxial cables listed in Table 820.154 and illustrated in Figure 800.154 shall be considered suitable for the purpose and shall be permitted.
FPN No. 1: See Figure 820.154, Cable Substitution Hierarchy.
FPN No. 2: The substitute cables in Table 820.154 are only coaxial-type cables.
Substantiation: Section 2.3 of the NEC Style Manual provides for two options for figures, either they are mandatory and can have mandatory language (shall) or they are non-mandatory and are in a fine print note and do not contain mandatory language. This comment will bring the cable substitution figures into compliance with the style manual by making the cable substitution figures part of the mandatory text.
Similar corrections for Articles 770 and 800 are in another comment.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 16-248.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-248 Log #936 NEC-P16 Final Action: Accept (820.154)
Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA
Comment on Proposal No: 16-319
Recommendation: Accept this proposal in principle making the following changes and renumbering the titles of the Tables and Figures as shown:
(E) Cable Substitutions. The uses and substitutions for CATV coaxial cables listed in Table 820.154(E) and illustrated in Figure 820.154(E) shall be permitted.
FPN No. 1: See Figure 820.154, Cable Substitution Hierarchy.
FPN No. 2: The substitute cables in Table 820.154(E) and Figure 820.154(E) are only coaxial-type cables.
Renumber Table 820.154 to be Table 820.154(E) and Figure 820.154 to be Figure 820.154(E).
Substantiation: Section 2.3 of the NEC Style Manual provides for two options for figures, either they are mandatory and can have mandatory language (shall) or they are non-mandatory and are in a fine print note and do not contain mandatory language. This comment will bring the cable substitution figures into compliance with the style manual by making the cable substitution figures part of the mandatory text.
Similar corrections for Articles 725, 760, 770 and 800 are contained in other Comments.
This Comment has been prepared by a Task Group established by the Technical Correlating Committee. The Task Group includes R. Owen, M. Ode, S. Owen, J. Brunssen, S. Kaufman, S. Johnson, S. L. Stiene and S. D. Kahn.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-249 Log #1291 NEC-P16 Final Action: Accept (820.154)
Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-321
Substantiation: The Standards Council issued two decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address Code Making Panel (CMP) decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification whether the Standards Council directive prohibits this NEC project from deleting the Fine Print Notes to sections 770.154, 800.154 & 820.154. The Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC project would not violate the directive by deleting the fine print notes at issue.”
The later decision states, in pertinent part, as follows: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.” The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).” The decision also states: “Nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Code development process. Proposals to the fine print notes were filed and rejected by the responsible CMP based on its then understanding of the Council’s directive. The subject was explicitly raised during the Report on Proposals phase of the process and is clearly open for further consideration and action during the Comment phase.”
For FPN is being misinterpreted and used in aggressive marketing attempts to require the installation of limited combustible cable” (one such example is found at http://www.dupont.com/cablingsolutions/products/codes.html). The FPN has had a profound effect in which it is used in misleading the AHJ to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. As an example, an AHJ Massachusetts would not provide a certificate of occupancy until the communications cabling was either replaced with limited combustible cable, the CMP cable was placed in conduit, or a sprinkler system installed above the suspended ceiling. Although the installer had met all the requirements of the NEC, the FPN misled the AHJ causing project delays and the potential of inordinate cost to the project. A plea to the NFPA aided the communications installer in which clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The installation of the CMP cable was allowed.
To further the removal of this FPN, the Report on Proposals A2006 from NFPA 13 (copy provided), the NFPA committee specifically added an annex
A.8.14.1.2.1 in 13-284 log #551 stating that, “Some minor quantities of combustible materials, such as communication wiring, can be present in some concealed spaces but should not typically be viewed as requiring sprinklers” (see 8.14.1.1). The threshold value at which sprinklers become necessary in the concealed space is not defined. For example, the usual amounts of data or telephone wiring found above a ceiling would not typically constitute a threat. If bundles of unshielded computer wiring are installed above the ceiling or beneath the floor in a manner where fire propagation in all directions is likely, then the concealed space should be treated the same as a combustible space, thereby requiring appropriate sprinkler protection.

In addition to the above, Panel 3 rejected the last minute introduction of this proposal that was made in the ROC stage. BICSi, which represents 24,000 installers, designers and manufacturers, feels that this last minute interjection of a FPN was not sufficiently vetted to industry and that the TCC should review this matter.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50. OHDE, H.: This comment should have been accepted as this FPN does not provide useful guidance as indicated in the Panel Statement. This FPN which references 8.14.1.1 of NFPA 13 (2002) Installation of Sprinkler Systems has shown to be problematic and therefore should be deleted as allowed per Standards Council Decision D#06-05. If the FPN were to be deleted this would in effect restore the NEC to the 2002 edition.

The panel also noted that the 2007 Edition of NFPA 13 would automatically eliminate the possibilities of misinterpretation. There was no opportunity for CMP 16 or the public to review the new proposed edition to see if this would eliminate the possibilities of misinterpretation. There was no opportunity to clarify the proposed FPNs to 820.179(A) and (B) do not comply with the NEC Style Manual.

The Proposal as submitted defines the damage and specifies performance requirements in the FPNs.

The panel is acting on this and other proposals related to wire and cable in plenum and other air-handling spaces based on NFPA Standards Council Decision D#05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

“So as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.”

This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected proposal.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-251 Log #2057 NEC-P16  Final Action: Accept  (820.154)

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-320

Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to create a new cable designation (CATV50) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s substantiation would have misled the designer, installer and code official to believe, install and enforce that limited combustible cable, conduit, or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13, Section 8.14.1. The submitter’s substantiation references NFPA 2002 NFPA 13 Section 8.14.1. It is important to note that the NEC does not have a definition of “construction” therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1.1 of NFPA 13 has been revised to read as follows: 8.14.1.2 Concealed Spaces Not Requiring Sprinkler Protection. 8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as through joists. (For additional information on combustible loading see A.8.14.1.2.1). 8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc...can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined. In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-253 Log #749 NEC-P16  Final Action: Reject  (820.154, FPN)

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-321

Recommendation: This proposal should be Accepted.

Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 and is included for your review. It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provide directions for as follows: “If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC.”

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:
(1) Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards

(2) Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations

(3) Promote Fine Print Notes referencing NFPA 13 in the NEC

(4) Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required

(5) Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13

(6) Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted)

(7) Provide instructions for building officials to threaten and harass building owners to use the proponents products

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one many “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 13 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cable do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Note will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.


16-254 Log #750 NEC-P16 Final Action: Reject (820.154, FPN)

Submitter: James T. Dollard, Jr., IBEW Local Union 98

Comment on Proposal No: 16-329

Recommendation: This proposal should be Accepted.

Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 and is included for your review. It is important to note that Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council.

The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:

"If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC.”


16-255 Log #751 NEC-P16 Final Action: Reject (820.154, FPN)

Submitter: James T. Dollard, Jr., IBEW Local Union 98

Comment on Proposal No: 16-331

Recommendation: This proposal should be Accepted.

Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 and is included for your review. It is important to note that Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council.

The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:

"If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC.”
These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:

1. Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards
2. Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations
3. Promote Fine Print Notes referencing NFPA 13 in the NEC
4. Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required
5. Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13
6. Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted)
7. Provide instructions for building officials to threaten and harass building owners to use the proponents products

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one example field guide titled “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 13 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Note will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-250.

16-256 Log #752 NEC-P16
(820.154, FPN )

Final Action: Reject

Submitter: James T. Dollard, Jr., IBEW Local Union 98

Comment on Proposal No: 16-332

Recommendation: This proposal should be Accepted.

Substantiation: The submitter of this proposal to delete the Fine Print Note referencing NFPA 13 is correct in his substantiation. However, CMP-16 rejected this proposal on the basis of the directive from Standards Council D#05-24, to remain “status quo” on issues with respect to NFPA 90A. The Standards Council has recently decided that the Fine Print Notes under the purview of CMP-16 which reference NFPA 13 may be deleted, and such deletion is not in conflict with the Standards Council directive. This final Standards Council decision is titled D#06-03 and is included for your review. It is important to note that, Standards Council clearly recognizes the 2002 edition of the NEC, in which these Fine Print Notes were not included, as the status quo.

An appeal was made by Mr. A. Weidman in an attempt to overturn the previous decision by Standards Council to allow CMP-16 to delete the Fine Print Notes referencing NFPA 13. The appeal was soundly denied by Standards Council. The final decision, D#06-19 is also included for your review. It is extremely interesting to note that the last sentence of the decision by Standards Council provides directions for CMP-16 as follows:

“If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC.”

These Fine Print Notes are problematic. Following the advice of Standards Council, they should be deleted. These Fine Print Notes exist solely to manipulate, misinform and threaten end users of the NEC. The proponents of fluoropolymer products have developed an elaborate, financially driven scheme outlined as follows:

1. Develop an Association (CFRA), funded by manufacturers, to coordinate and orchestrate unethical marketing plans by manipulation NFPA codes and standards
2. Place consultants, hired to push fluoropolymer interests, on CMP-3 and CMP-16 under the cloak of other organizations
3. Promote Fine Print Notes referencing NFPA 13 in the NEC
4. Use the Fine Print Notes to develop deceiving literature and presentations to manipulate the NFPA family of codes and standards to promote products which are not required
5. Misinform and manipulate building code officials with a propaganda campaign based on Fine Print Notes in the NEC which reference NFPA 13
6. Label this deceptive literature, designed for building officials, as “Field Guides” and “Inspection Checklists” (See an example field guide that I have submitted)
7. Provide instructions for building officials to threaten and harass building owners to use the proponents products

In summary, the proponents of retaining these Fine Print Notes are engaged in an effort to misrepresent and manipulate the NFPA Family of Codes and Standards for their own financial gain. Provided for your review is just one example field guide titled “Field Guides” supplied by the Cable Fire Research Association to Building Officials across the United States. As you read this “field guide” take note of the serious manipulation and misrepresentation of the NEC and NFPA 13, designed specifically to sell products in which the proponents have financial interests.

The efforts of this same group to manipulate the NFPA family of codes and standards in NFPA 90A led to the “return to committee” of the entire document. The NFPA 13 committee has taken serious steps to stop this runaway propaganda campaign by adding informational text explaining that usual amounts of cabling do not represent a problem. This is referenced in the original proposal to delete the Fine Print Note.

CMP-16 has been lied to by the proponents of these Fine Print Notes referencing NFPA 13. The only reason they exist is to fuel a financially driven propaganda campaign. Retaining these Fine Print Note will lead to continued deception, misrepresentation and manipulation which will lead to the lack of adoption of the NEC.

Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-250.

16-257 Log #1593 NEC-P16
(820.154, FPN )

Final Action: Reject

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute

Comment on Proposal No: 16-321

Recommendation: This proposal should be accepted.

Substantiation: This submitter’s substantiation states that this FPN has misled the AHJ to believe and enforce limited combustible cable, conduit or a sprinkler system to be installed within the concealed space or plenums. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore, making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling, or is it a space above a plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1.2 of NFPA 13 has been revised to read as follows: 8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection. 8.14.1.2 Concealed spaces of noncombustible and limited combustible...
construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc...can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined. In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A. Standards Council recently issued another decision (D#06-03) which decided that this FPN may be deleted and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo. This FPN referencing NFPA 13 was added to the 2005 NEC, therefore, it can and should be deleted.

Panel Meeting Action: Reject

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: JENSEN, R.: This FPN, as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space. In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.


Final Action: Reject
or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.
OHDE, H.: See my Explanation of Negative for Comment 16-250.

16-260 Log #198 NEC-P16 Final Action: Accept
(Figure 820.154)

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-325
Recommendation: The Technical Correlating Committee directs that the Panel
clarify the placement of the additional text added by the proposal as follows:
"Type BM-Network-Powered Broadband Communications Medium Power
cable" should be placed in the figure directly below the similar text for CATV
cm. and CM. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations
Governing Committee Projects.
Panel Meeting Action: Accept
Add the following legend beneath “Type CATV…” and “Type CM…”
below the figure to read as follows: “Type BL network-powered broadband
communications low power cable” and “Type BM network-powered broadband
communications medium power cable”.
Panel Statement: The panel accepts the direction of the TCC to clarify the
panel action.
The panel also added reference to Type BL cable, as it was also missing.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-261 Log #1769 NEC-P16 Final Action: Reject
(820.154(A))

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-332
Recommendation: Accept proposal to delete Fine Print Note
for requirements for sprinklers in concealed spaces containing exposed-
combustible materials.
Substantiation: The Standards Council issued two decisions, NFPA Standards
Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA
Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These
decisions address Code Making Panel (CMP) decisions on Fine Print Notes
referencing NFPA 13. The former (earlier) decision states, in pertinent part:
"Mr. Dollard asks for clarification whether the Standards Council directive
prohibits the NEC project from deleting the Fine Print Notes to sections
770.154, 800.154 & 820.154. The Council, after due consideration, believes
that clarification is appropriate in this instance and responds that the NEC
project would not violate the directive by deleting the fine print notes at issue."
The later decision states, in pertinent part, as follows: “if the fine print notes
are not a helpful reference to NFPA 13 or engender confusion, the NEC Project
should have the ability to delete them and nothing in the Council’s status quo
directive prohibits this.” The decision also states: “It has also been pointed out
that deletion of the fine print notes would provide further consistency within
the NEC itself since, currently, the fine print notes at issue only appear in some
relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles
725 and 760).” The decision also states: “nothing in NFPA procedures prevents
the NEC Project from considering and acting on deletion of the fine print notes
during the Comment phase of the code development process. Proposals to the
fine print notes were filed and rejected by the responsible CMP based on its
then understanding of the Council’s directive. The subject was explicitly raised
during the Report on Proposals phase of the process and is clearly open for
further consideration and action during the Comment phase.”
This FPN is being misinterpreted and used in aggressive marketing attempts
to require the installation of “limited combustible cable” (one such example is
found at http://www.dupont.com/cablingsolutions/products/codes.html). The
FPN has had a profound effect in which it is used in misleading the AHJ to
require limited combustible cable, conduit, or a sprinkler system to be installed
within the concealed space.

As an example, an AHJ Massachusetts would not provide a certificate of
occupancy until the communications cabling was either replaced with limited
combustible cable, the CMP cable was placed in conduit, or a sprinkler system
installed above the suspended ceiling. Although the installer had met the
requirements of the NEC, the FPN misled the AHJ causing project delays and the
potential of inordinate cost to the project. A plea to the NFPA aided the
clarification was given that the CMP cabling was indeed sufficient to meet code and that NFPA 13 allowed some quantities (which is not defined) of communications cabling within concealed spaces. The
installation of the CMP cable was allowed.

16-262 Log #1793 NEC-P16 Final Action: Reject
(820.154(A))

Submitter: Robert W. Jensen, dbi
Comment on Proposal No: 16-329
Recommendation: Accept proposal to delete Fine Print Note
for requirements for sprinklers in concealed spaces containing exposed-
combustible materials.
Substantiation: The Standards Council issued two decisions, NFPA Standards
Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA
Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These
decisions address Code Making Panel (CMP) decisions on Fine Print Notes
referencing NFPA 13. The former (earlier) decision states, in pertinent part:
“Mr. Dollard asks for clarification whether the Standards Council directive
prohibits the NEC project from deleting the Fine Print Notes to sections
770.154, 800.154 & 820.154. The Council, after due consideration, believes
that clarification is appropriate in this instance and responds that the NEC
project would not violate the directive by deleting the fine print notes at issue.”
The later decision states, in pertinent part, as follows: “if the fine print notes
are not a helpful reference to NFPA 13 or engender confusion, the NEC Project
should have the ability to delete them and nothing in the Council’s status quo
directive prohibits this.” The decision also states: “It has also been pointed out
that deletion of the fine print notes would provide further consistency within
the NEC itself since, currently, the fine print notes at issue only appear in some
relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles
725 and 760).” The decision also states: “nothing in NFPA procedures prevents
the NEC Project from considering and acting on deletion of the fine print notes
during the Comment phase of the code development process. Proposals to the
fine print notes were filed and rejected by the responsible CMP based on its
then understanding of the Council’s directive. The subject was explicitly raised
during the Report on Proposals phase of the process and is clearly open for
further consideration and action during the Comment phase.”
This FPN is being misinterpreted and used in aggressive marketing attempts
to require the installation of “limited combustible cable” (one such example is
found at http://www.dupont.com/cablingsolutions/products/codes.html). The
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require the installation of “limited combustible cable” (one such example is
during the Report on Proposals phase of the process and is clearly open for
clarification is appropriate in this instance and responds that the NEC
770.154, 800.154 & 820.154. The Council, after due consideration, believes
prohibits the NEC project from deleting the Fine Print Notes to sections
referencing NFPA 13. The former (earlier) decision states, in pertinent part:
decisions address Code Making Panel (CMP) decisions on Fine Print Notes
Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These
Recommendation:
Submitter:
Robert W. Jensen, dbi
Comment on Proposal No: 16-331
Recommendation: Accept proposal to delete Fine Print Notes
Substantiation: The Standards Council issued two decisions, NFPA Standards
Council Decision 06-19 (SC 906-7-33) dated 28 July 2006. These
decisions address Code Making Panel (CMP) decisions on Fine Print Notes
referring to NFPA 13. The former (earlier) decision states, in pertinent part:
“Mr. Dollard asks for clarification whether the Standards Council directive
prohibits the NEC project from deleting the Fine Print Notes to sections
770.154, 800.154 & 820.154. Although the NEC project should have the ability to delete them and nothing in the Council’s status quo
directive prohibits this.” The decision also states: “It has also been pointed out
that deletion of the fine print notes would provide further consistency within the
NEC itself since, currently, the fine print notes at issue only appear in some
relevant NFPA 13 (copy provided) and those Notes to sections 770.154, 800.154 & 820.154. The
Council, after due consideration, believes that clarification is appropriate in this instance and responds that the NEC
project would not violate the directive by deleting the fine print notes at issue.”
The latter decision states, in pertinent part, as follows: “if the fine print notes are not
required to NFPA 13 or engender confusion, the NEC project should have
the ability to delete them and nothing in the Council’s status quo
directive prohibits this.” The Association also states: “The FPN continues to provide useful guidance. Possibilities
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to
market limited combustible cable. The NEC should not be used for this
purpose. The FPN has had a profound effect in which it is used in misleading
the AHJ, designers and installers to require limited combustible cable, conduit,
or a sprinkler system to be installed within the concealed space.
In addition to the above, Panel 3 rejected the last minute introduction of this
proposal that was made in the ROC stage. BICSI, which represents 24,000
installers, designers and manufacturers, feels that this last minute interjection of
a FPN was not sufficiently vetted to industry and that the TCC should review
this matter.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to
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Ballot Results: Affirmative: 12 Negative: 3
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Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities
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Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities
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Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
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a FPN was not sufficiently vetted to industry and that the TCC should review
this matter.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN, R.: This FPN, as informative text to the NEC, is being used to
market limited combustible cable. The NEC should not be used for this
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or a sprinkler system to be installed within the concealed space.
In addition to the above, Panel 3 rejected the last minute introduction of this
proposal that was made in the ROC stage. BICSI, which represents 24,000
installers, designers and manufacturers, feels that this last minute interjection of
a FPN was not sufficiently vetted to industry and that the TCC should review
this matter.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The FPN continues to provide useful guidance. Possibilities
8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustibles shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic, plumbing piping, non-structural wood, etc. can be present in concealed spaces constructed of limited or noncombustible materials but should not be so distributed as to be viewed as required. For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

The same change is being proposed to the corresponding Fine Print Notes in articles 770 and 800, all of which deal with the same type of cables.

The committee rejected the proposal based on, and I quote: “NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows: “[S]o as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.””

However, Standards Council has since issued two new decisions, NFPA Standards Council Decision 06-03 (SC #06-3-18) dated 22 March 2006 and NFPA Standards Council Decision 06-19 (SC #06-7-33) dated 28 July 2006. These decisions address CMP decisions on Fine Print Notes referencing NFPA 13. The former (earlier) decision states, in pertinent part: “Mr. Dollard asks for clarification when the fine print notes are not a helpful reference to NFPA 13 and engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.”

The decision also states: “It has also been pointed out that deletion of the fine print notes would provide further consistency within the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).”

The decision also states: “Nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the Comment phase of the code development process. The question whether the fine print notes should be in the NEC itself since, currently, the fine print notes at issue only appear in some relevant NEC Articles (Articles 770, 800, and 820), but not in others (Articles 725 and 760).”

Thus, clearly these Standards Council decisions directly permit the deletion of the Fine Print Note addressed by this comment. Technically this Fine Note need not be deleted for two reasons:

1. This Fine Print Note is misleading by pointing the reader to NFPA 13 which does not require the use of sprinklers, as both Bob Jensen and Harry Ohde point out in their negative votes and as is shown by the sections of NFPA 13 reproduced above.

2. This Fine Print Note is identical to the ones in 770.154 (A) and in 800.154 (A), both of which are equally misleading. On the other hand there are no Fine Print Notes in articles 725 and 760. Thus, deleting this Fine Print Note will provide further consistency within the NEC.

Panel Meeting Action: Reject


Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: JENSEN, S.: This FPN as informative text to the NEC, is being used to market limited combustible cable. The NEC should not be used for this purpose. The FPN has had a profound effect in which it is used in misleading the AHJ, designers and installers to require limited combustible cable, conduit, or a sprinkler system to be installed within the concealed space.

In addition to the above, Panel 3 where there is not a marketing influence, rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820 are interchangeable in many applications, yet there is no correlation of such a FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-250.

Submitter: Donald Hall, Corning Cable Systems

Comment on Proposal No: 16-329

Recommending Note: The commenter is also submitting analogous comments to Proposal 16-197 (ROP Log #3097) and Proposal 16-78 (ROP Log #3098) pertaining to FPNs referencing NFPA 13 section 8.14.1. Accept the proposal to delete the FPN leading to the following:

820.154 Applications of Listed CATV Cables and CATV Raceways.

CATV cables shall comply with the requirements of 820.154(A) through 820.154(D) or where cable substitutions are made as shown in 820.154(F).

(A) Plenums. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type CATVP. Abandoned cables shall not be permitted to remain. Types CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted. Listed plenum CATV raceways shall be permitted to be installed in ducts and plenums as described in 820.154(A) and in other spaces used for environmental air as described in 300.22(C). Only Type CATVP cables shall be permitted to be installed in these raceways.


Substantiation: The committee rejected this proposal without any consideration of its merits, based on its belief at the time that it fell within the scope of Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005. Since that time, however, the Standards Council has issued two new decisions as shown below: Decision 06-03 (SC #06-7-33) dated 28 July 2006 states: “If the fine print notes are not a helpful reference to NFPA 13 or engender confusion, the NEC Project should have the ability to delete them and nothing in the Council’s status quo directive prohibits this.”

And

“Nothing in NFPA procedures prevents the NEC Project from considering and acting on deletion of the fine print notes during the comment phase of the code development process.”

And

“If the fine print notes are in any way problematic, they should now be deleted, restoring the NEC in this regard to the status quo on plenum cable issues represented by the 2002 edition of the NEC”.

In view of the above decisions, the commenter requests that the proposal be considered on its merits as stated in the original proposal substantiation and as further substantiated below.

Since the original proposal was submitted, the following Annex Note was added to the 2007 Edition of NFPA 13:

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, nonstructural wood, etc. can be present in concealed spaces constructed of limited or noncombustible materials but should not typically be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers which would not otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

Additionally, the standard approach of the NEC is to require the use of listed products which are tested and approved by a Nationally Recognized Test Laboratory (NRTL) as being suitable for use in a particular application. Normal fire hazards associated with an application space and the application of wiring methods are considered a concealed space that requires assessment of risks from fire hazards associated with these spaces. The safety record of the NEC or the NRTLs has failed to adequately recognize the hazards associated with these spaces. The safety record ofNormal fire hazards associated with an application space and the application of wiring methods are considered a concealed space that requires assessment of risks from fire hazards associated with these spaces. The safety record of the NEC or the NRTLs has failed to adequately recognize the hazards associated with these spaces. The safety record of

Ballot Results: Affirmative: 12 Negative: 3
16-266 Log #1595 NEC-P16 Final Action: Reject
(820.154(A), FPN )

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute

Comment on Proposal No: 16-331

Recommem: This proposal should be accepted.

Substantiation: This FPN should be deleted as the submitter proposed. In the
submitter’s substantiation he states that this FPN has misled the AHJ to believe
and enforce limited combustible cable, conduit or a sprinkler system to be
installed within the concealed space.

In the above, Panel 3 where there is not a marketing influence,
rejected the inclusion of this FPN in Article 725. Cables used in 725 and 820
are interchangeable in many applications, yet there is no correlation of such a
FPN.

JOHNSON, S.: See my explanation of negative vote on Comment 16-50.

OHDE, H.: See my Explanation of Negative for Comment 16-250.

16-267 Log #1293 NEC-P16 Final Action: Accept
(820.154(D))

Submitter: James M. Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-334

Recommendation: The panel action should be Accept in Part by continuing to
accept the deletion of the last sentence and adding the words “in accordance”
between “shall be” and “with” in the first sentence.

Substantiation: The current text is incomplete. Addition of the two words does
not change any of the requirements.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-268 Log #1464 NEC-P16 Final Action: Reject
(820.154(E) (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Comment on Proposal No: 16-320

Recommendation: Reconsider proposal 16-320 and revise 820.154 as shown
below.

(E) CATV Fire Hazard (FHC) Cable. CATV Fire hazard (FHC) cable shall be
permitted for use in communications systems as other wiring within buildings.

Substantiation: The application of the Standards Council’s decision on NFPA
90A was an error. The proposed marking on the cable did not include a “P”
added to CATV Type CATV cable is permitted to be installed in this section.
This comment creates a new section for the fire hazard cable. The new
section provides a requirement that clearly identifies that the fire hazard
cable is permitted to be installed as “Other Wiring Within Buildings.”

To better clarify that the Standards Council’s decision on NFPA does not
apply and to better clarify where the cable is permitted to be installed, the
marking on the cable is changed to Type CATV-FHC. The “FHC” suffix stands
for fire hazard cable. There is a companion comment to revise the marking
found in my comment to Proposal 16-344.

Some installations require large amounts of cable. A typical application of a
fire hazard cable would be above a suspended ceiling or under a raised floor,
norther of which is a plenum. The proposed cable has a very low fuel load, as
compared to other types of cable insulation. Some cable constructions use one
type of insulation on the conductor and another type for the jacket.

The Type CATV-FHC cable suggested for listing and marking in 820.179(E)
(comment to proposal 16-244) has parameters (e.g. 3500 BTU/lb) that are
standard in the building industry, and useful to system designers and fire
protection engineers.

To put cable insulation heat release in perspective, here are relative values:
Fire Hazard Cable insulation: less than 8 MJ/kg (3,500 BTU/lb)

PVC insulation: As high as 25 MJ/kg (11,000 BTU/lb)

Polyolefin insulation: As high as 66 MJ/kg (24,000 BTU/lb)

Panel Meeting Action: Reject
Panel Statement: Proposal 16-320 is reconsidered.

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-337

Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to create a new cable
designation (CATV50) is nothing more than a marketing ploy. A backdoor
approach you might say to get NFPA 255 and NFPA 259 cables in the cable
hierarchy. The submitter’s recommendation to add this FPN to this section is
in grave error. This FPN would not provide guidance to designers, installers
or code officials. This FPN would have misled the designer, installer and
code officials to believe, install and enforce that limited combustible cable,
conduit or a sprinkler system to be installed in the concealed space or plenums
would be a requirement because of NFPA 13, Section 8.14.1.4. The submitter’s
substantiation references 2002 NFPA 13 Section 8.14.1. It is important to
note that the NEC does not have a definition of “concealed spaces”, therefore
making it impossible to enforce. What constitutes a concealed space? Is it
the space above a dropped ceiling; or is it a space above plastered or drywall
ceiling? Is it the wall cavity of typical wall construction?

16-269 Log #2060 NEC-P16 Final Action: Accept
(820.154(E))

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-337

Recommendation: Continue to Reject.

Substantiation: The submitter’s recommendation to create a new cable
designation (CATV50) is nothing more than a marketing ploy. A backdoor
approach you might say to get NFPA 255 and NFPA 259 cables in the cable
hierarchy. The submitter’s recommendation to add this FPN to this section is
in grave error. This FPN would not provide guidance to designers, installers
or code officials. This FPN would have misled the designer, installer and
code officials to believe, install and enforce that limited combustible cable,
conduit or a sprinkler system to be installed in the concealed space or plenums
would be a requirement because of NFPA 13, Section 8.14.1. It is important to
note that the NEC does not have a definition of “concealed spaces”, therefore
making it impossible to enforce. What constitutes a concealed space? Is it
the space above a dropped ceiling; or is it a space above plastered or drywall
ceiling? Is it the wall cavity of typical wall construction?
8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

Panel Statement:

Panel Meeting Action: Hold

shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

The number, title, and the date of the latest edition of the UL standard were corrected to reflect the current applicable standard. The reference in the CSA standard and the date of the CSA standard were also corrected.

Panel Meeting Action: Hold

Panel Statement: The proposal was editorial, seeking no changes to the fine print note. A technical change in the fine print note would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-273 Log #2292 NEC-P16 (820.179(C))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN as shown:

FPN: One method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in UL1685-2000 Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.

Another method of determining that the cable is resistant to the spread of fire is the “Vertical Flame Test - Cables in Cable Trays,” in CSA C22.2 No. 0.3-M-2001, Test Methods for Electrical Wires and Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

The sentence “The smoke measurements in the test method are not applicable.” is mandatory language.

Panel Meeting Action: Hold

Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in ANSI/UL 1666-2002 Standard for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold

Panel Statement: The proposal was editorial, seeking no changes to the fine print note. A technical change in the fine print note would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold

Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold

Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

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Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold

Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold

Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-340

Recommendation: The Panel Action should have been to Accept in Principle and reword the FPN to read:

FPN: One method of determining that the cable is resistant to the spread of fire is the VW-1 (vertical-wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

Panel Meeting Action: Hold

Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-274 Log #2294 NEC-P16 (820.179(D))

Final Action: Hold
8.15.1 Concealed Spaces

To put cable heat release in perspective, here are relative values:
PVC insulation: As high as 25 MJ/kg (11,000 BTU/lb)

A backdoor approach you might say to get NFPA 255 and NFPA 259 cables designation (concealed space cable) is nothing more than a marketing ploy.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Comment on Proposal No: 16-344

Recommendation: Reconsider proposal 16-344 and revise 820.179 as shown below.

(E) CATV Limited Fire Hazard (-FHC) Cable. Cables used to reduce potential heat release shall be listed as fire hazard (-FHC) cable and shall have a low potential heat release. Fire hazard cables specified in 820.154(E), and used to reduce potential heat release shall have an additional classification using the suffix “-FHC”.

FPN No. 1: One method of defining a low potential heat release cable is that the cable exhibits a maximum potential heat value of exceeding 8141 kJ/kg (3500 Btu/lb) when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Burning Materials, as well as a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials.

Substantiation: The application of the Standards Council’s decision on NFPA 90A was an error. The proposed marking on the cable did not include a “P” added to CATV, Type CATVP cable is permitted to be installed in plenums.

To better clarify that the Standards Council’s decision on NFPA does not apply and to better clarify where the cable is permitted to be installed, the marking on the cable is changed to Type CATV-FHC. The “FHC” suffix stands for fire hazard cable. There is a companion comment to revise the application of fire hazard cable in my comment to Proposal 16-329.

The proposed cable provides listing parameters useful to system designers and fire protection engineers.

The key parameter in the listing requirements is potential heat release. To put cable heat release in perspective, here are relative values:
Fire Hazard Cable insulation: less than 8 MJ/kg (3,500 BTU/lb)
PVC insulation: as high as 25 MJ/kg (11,000 BTU/lb)

Polylefin insulation: As high as 46 MJ/kg (20,000 BTU/lb)

Polylefin insulation is sometimes used as insulation on conductors, and is covered by a PVC jacket. Polylefin insulation provides better electrical properties (dielectric constant) than PVC insulation.

Additionally, flame spread and smoke developed parameters identify the robustness of the cable.

A flame spread index of 25 is found in a number of NFPA publications, for example:
NFPA 13:2007
8.15.1 Concealed Spaces
8.15.1.2.10 Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less, and the materials have been demonstrated not to propagate fire when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, extended for an additional 20 minutes in the form in which they are installed, shall not require sprinkler protection.

NFPA 13 use of “concealed spaces” corresponds to a typical dictionary definition: out of sight, hidden. This definition add “spaces” to “concealed” and represents a different meaning from how the NEC defines “concealed.” Where both the NEC and NFPA 13 apply, “concealed” cable can be removed from a “concealed space.” After removal of the cable, the “concealed space” would remain.

A smoke developed index of 50 is more rigorous than the typical smoke developed index of 450 for interior finishes. Interior finishes can be considered a “fixed” application: one sheet or one coat. Cable installations are a “variable” application: one cable or hundreds of cables. It seems reasonable to establish a robust requirement, due to the variable application. Electronic equipment is susceptible to damage from smoke and heat, both components of a fire.

Panel Meeting Action: Rej

Panel Statement: Cable meeting specifications as described in this comment is not prohibited by the Code, and the panel sees no need for an additional marking.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-277 Log #2061 NEC-P16 Final Action: Accept
(820.179(E))

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-344

Recommendation: Continue to reject.

Substantiation: The submitter’s recommendation to create a new cable designation (concealed space cable) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s substantiation would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does have a definition of “concealed spaces”, therefore, the confusion and making it impossible to enforce. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:
8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access but not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building soffit where the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-277 Log #2061 NEC-P16 Final Action: Accept
(820.179(E))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Comment on Proposal No: 16-344

Recommendation: Consider to reject.

Substantiation: The submitter’s recommendation to create a new cable designation (concealed space cable) is nothing more than a marketing ploy. A backdoor approach you might say to get NFPA 255 and NFPA 259 cables in the cable hierarchy. The submitter’s substantiation would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13 Section 8.14.1. It is important to note that the NEC does have a definition of “concealed spaces”, therefore, the confusion and making it impossible to enforce. What does constitute a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:
8.14.1.2 Concealed Spaces not Requiring Sprinkler Protection.

8.14.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1)

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access but not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, non-structural wood, etc... can be present in concealed spaces constructed of limited or noncombustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For example, it is not the intent of this section to require sprinklers, which would not otherwise be required, in the interstitial space of a typical office building soffit where the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-277 Log #2061 NEC-P16 Final Action: Accept
(820.179(E))
16-278 Log #2296 NEC-P16  Final Action: Accept  
(820.179(E))

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-344
Recommendation: The Panel action should continue to be Reject.
Substantiation: The proposed FPN No. 1 does not comply with the NEC Style Manual.
3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements in the FPNs.
Panel Meeting Action: Accept
Panel Statement: The panel rejected Proposal 16-344 and reaffirms its rejection by accepting Comment 16-277. The panel action does not indicate agreement or disagreement with the substantiation for the comment.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-279 Log #2297 NEC-P16  Final Action: Accept  
(820.179(E))

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-345
Recommendation: The Panel action should continue to be Reject.
Substantiation: The proposed FPN does not comply with the NEC Style Manual.
3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The FPN proposed defines the damage and specifies the performance requirements.
Panel Meeting Action: Accept
Panel Statement: The panel is acting on this and other proposals related to wire and cable in plenum and other air handling spaces based on NFPA Standards Council Decision 05-24 (SC #05-7-4) dated 29 July 2005 that states, in pertinent part, as follows:

“So as not to inject the problems identified in the 2002 edition of NFPA 90A into the NEC®, and in order to give the Technical Committee on Air Conditioning the opportunity to fully address all technical issues related to plenum cables by processing the issues through the entire upcoming NFPA 90A revision cycle, the Council directs the NEC Project to maintain the status quo in the NEC until the Technical Committee on Air Conditioning has, through the processing of NFPA 90A, addressed the issues and released the next edition of NFPA 90A.”

This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected proposal.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-280 Log #2304 NEC-P16  Final Action: Accept  
(820.179(E) (New))

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-346
Recommendation: The panel rejected Proposal 16-346 and reaffirms its rejection by accepting Comment 16-276. The panel action does not indicate agreement or disagreement with the substantiation for the comment.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

ARTICLE 830 — NETWORK-POWERED BROADBAND COMMUNICATIONS SYSTEMS

16-280a Log #CC1603 NEC-P16  Final Action: Accept  
(820.2)

Submitter: Code-Making Panel 16,  
Comment on Proposal No: 16-245
Recommendation: Delete the definition of CATV Raceway including the FPN in 820.2.
Substantiation: The panel intends to delete the definition. The listing requirements in 820.182 adequately describe a CATV raceway.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-281 Log #251 NEC-P16  Final Action: Accept in Part  
(830.2)

Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-357
Recommendation: Accept this proposal in principle in part by continuing to accept the modification to the definition of the point of entrance and rejection the addition of the fine print notes. Add the following additional definitions: Intermediate Metal Conduit (Type IMC). The definition in 342.2 shall apply. Rigid Metal Conduit (Type RMC). The definition in 344.2 shall apply.
Substantiation: Article 830 uses the terms Intermediate Metal Conduit and Rigid Metal Conduit. These terms are defined in Articles 342 and 344 respectively. Because of 90.3 (excerpted below), these definitions do not apply to Chapter 8. They will apply if this comment is accepted.

“Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.”
Panel Meeting Action: Accept in Part
Panel Statement: The panel accepts the deletion of the FPNs and rejects the addition of the new definitions. See panel action and statement on Comment 16-100.

The panel continues to accept the modification to the definition of the Point of Entrance.
The panel rejects the addition of the definitions of IMC and RMC.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-282 Log #1551 NEC-P16  Final Action: Accept  
(830.2)

Comment on Proposal No: 16-352
Recommendation: Continue to reject this proposal.
Substantiation: This proposal should continue to be rejected as the application of the “block” concept by the telecommunications utilities has resulted in an exemplary safety record. The many reasons for rejecting the proposal as it was is discussed in the Panel Statement accompanying Proposal 16-383 are appropriate and support continued rejection.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-283 Log #1584 NEC-P16  Final Action: Accept  
(830.2)

Submitter: Harold C. Ohde, IBEW-NECA Technical Institute
Comment on Proposal No: 16-350
Recommendation: Continue to reject.
Substantiation: The term “air duct” is not used in Article 830 and, therefore, it does not need to defined in 830.2. Defining a term that is not being used (such as air duct) in that Article is in direct violation with the National Electrical Code Style Manual. CMP 16 rejected this proposal based on the Standards Council decision D#05-24 to remain “status quo” on issues that pertain to NFPA 90A.

I do believe that expansion of or a new definition of air duct in another Article would be a violation Standards Council Decision D#05-24. Standards Council recognizes the 2002 edition of the NEC as being status quo.
Panel Meeting Action: Accept
Panel Statement: As there was no opportunity for public review and comment, the panel continues to affirm its original action on the referenced proposal in accordance with the action taken to comply with the Standards Council relative to the 90A Decision.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
16-284 Log #2305 NEC-P16  Final Action: Accept in Part
(830.2)

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-357

Recommendation: The Panel Action should continue to be Accept in Principle with the following additional revisions to the Panel Action.

In the definition for Point of Entrance, delete the last phrase in the Proposal “grounded to an electrode in accordance with 830.100(B)”

Delete the two FPNs.

Substantiation: The deletion of the phrase is required to comply with 2.2.2 of the NEC Style Manual which states “Definitions shall not contain requirements or recommendations.” and 2.3.2.2 of the Manual of Style for NFPA Technical Committee Documents which states “Definitions shall not contain requirements.”

The comments expressed by the Technical Correlating Committee on Proposals 16-116 and 16-117 provide valid reasons for the deletion of the FPNs.

Panel Meeting Action: Accept in Part

Panel Statement: The panel accepts the deletion of the FPNs. See panel action and statement on Comment 16-100.

The panel rejects the deletion of the phrase “connected by a grounding conductor to an electrode in accordance with 830.100(B)” because it is an integral and necessary part of the definition. See panel action and statement on Comment 16-87, which also applies to Article 830.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-285 Log #1118 NEC-P16  Final Action: Accept in Part
(830.2.Point of Entrance)

Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-357

Recommendation: The Panel Action should be continue to be Accept in Principle with the following additional revisions to the Panel Action.

In the definition for Point of Entrance, delete the last phrase in the Proposal “grounded to an electrode in accordance with 830.100(B)”

Delete the two FPNs.

Substantiation: The deletion of the phrase is required to comply with 2.2.2 of the NEC Style Manual which states “Definitions shall not contain requirements or recommendations.” and 2.3.2.2 of the Manual of Style for NFPA Technical Committee Documents which states “Definitions shall not contain requirements.”

The comments expressed by the Technical Correlating Committee on Proposals 16-116 and 16-117 provide valid reasons for the deletion of the FPNs.

Panel Meeting Action: Accept in Part

Panel Statement: The panel accepts the deletion of the FPNs. See panel action and statement on Comment 16-100.

The panel rejects the deletion of the phrase “connected by a grounding conductor to an electrode in accordance with 830.100(B)” because it is an integral and necessary part of the definition. See panel action and statement on Comment 16-87, which also applies to Article 830.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-289 Log #2062 NEC-P16  Final Action: Reject
(830.3(A), 830.25, and 830.26)

Submitter: Harold C. Ohde, IBEW #134

Comment on Proposal No: 16-365

Recommendation: This Proposal should have been Rejected.

Substantiation: The submitter’s recommendation to add a new 830.26 with this FPN No 2. to this section is in grave error. This FPN would not provide guidance to designers, installers or code officials. This FPN would have misled the designer, installer and code officials to believe, install and enforce that limited combustible cable, conduit or a sprinkler system to be installed in the concealed space or plenums would be a requirement because of NFPA 13, Section 8.14.1. It is important to note that the NEC does not have a definition of “concealed spaces”, therefore making it impossible to enforce. What constitutes a concealed space? Is it the space above a dropped ceiling; or is it a space above plastered or drywall ceiling? Is it the wall cavity of typical wall construction?

NFPA 13 just completed their revision process for the 2006 NFPA 13 Standard. 8.14.1 of NFPA 13 has been revised to read as follows:

8.14.1.2 Concealed Spaces
not Requiring Sprinkler Protection.

8.14.1.2.1 Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those as a return air for a plenum. (For additional information on combustible loading see A.8.14.1.2.1).

8.14.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustible shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

A.8.14.1.2.1 Minor quantities of combustible materials such as but not can be present in concealed spaces constructed of limited or non combustible materials but should not be viewed as requiring sprinklers (see 8.14.1.1). For otherwise be required, in the interstitial space of a typical office building solely due to the presence of the usual amount of cabling within the space. The threshold value at which sprinklers become necessary in the concealed space is not defined.

In the 2006 NFPA 13 committee’s substantiation, they wanted to clarify that the normal amount of cabling would not require sprinklers due to the construction of the space. They also expanded the list of combustibles to provide examples of potential combustible loading.
Requiring any and all cables to be properly supported is not overly restrictive.

The panel accepts the part of the proposal to delete existing subsection (A) given by the Standards Council, as were many other proposals which were rejected because of that direction given by the Standards Council decision (D#05-24) which decided that this FPN may be deleted from Sections 770.154, 800.154, and 820.154 (all under CMP 16 purview) and this deletion will not be in conflict with the Standards Council decision (D#05-24). Standards Council recognizes the 2002 edition of the NEC as being status quo.

Panel Meeting Action: Reject

Panel Statement: The panel rejected the text that the submitter of the comment objected to.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-290 Log 920 NEC-P16 Final Action: Accept (830.3(E))

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 16-367

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal and give further consideration to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

The panel accepts the direction of the TCC to clarify the panel action.

The panel accepts the part of the proposal to delete existing subsection (A) from 830.3, as it has been moved to 830.26. This was accomplished by panel action on Proposal 16-361.

It was not clearly stated in the panel action that the text was relocated in Proposal 16-367.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-291 Log 9201 NEC-P16 Final Action: Accept (830.24)

Submitter: Technical Correlating Committee on National Electrical Code

Comment on Proposal No: 16-373

Recommendation: The Technical Correlating Committee notes that neither the panel statement nor the revised statement shown in the affirmative vote are responsive to the submitter’s substantiation for the recommendation. The Technical Correlating Committee directs the panel to act on the merits of the recommendation. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting and continues to reject the proposal.

The requirements of 300.11 are applicable to network-powered broadband cables, are not overly restrictive, and are appropriate.

Securing an additional cable to an existing properly supported cable does not constitute support. Additional cables must be supported by the same structural member that supports the first cable. In such installations, additional cables are being supported by the same structural member.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative: BRUNNENSEN, J.: Proposal 16-373 should have been accepted. See my explanation of negative on Comment 16-297.

16-292 Log 9377 NEC-P16 Final Action: Reject (830.24)

Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA

Comment on Proposal No: 16-372

Recommendation: Reject the Proposal.

Substantiation: Although I agree with the proposal and the submitter’s intent to introduce consistency, the material is used in plenums and other air handling spaces. Consequently, the proposal should have been subjected to the direction given by the Standards Council, as were many other proposals which were rejected.

As Mr. Dorna noted in his “Explanation of Negative Vote”, “The UL Directory (2005), shows that category ZODZ covers “cable ties, cable tie mounts and similar types of related hardware”. Likewise, Conduit and Fittings, category DWV covers “cable ties, conduit straps, staples and similar hardware...” Both categories list as “Suitable for use in air handling spaces in accordance with Sec 300.22(C) and (D) of the National Electrical Code.”

This proposal should have been rejected because of the Standards Council decision concerning NFPA 90A. Code Making Panels must be consistent in their handling of all submitted proposals.

Panel Meeting Action: Reject

Panel Statement: This is not a 90A issue. The guide information for ZODZ, Wire Positioning Devices states that: “The investigation of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance and weatherability characteristics as appropriate for the product.”

These are all characteristics that we should be concerned about for electrical installations.

This reference to air handling spaces is only a reference and is stated as: “...for those devices which have been investigated to determine their suitability for use in air handling areas...”

This is in a standard statement that is found in a wide variety of listing categories including the category for IT and Telecom equipment to cover situations where a special investigation is done to evaluate a device for air handling spaces. It no way implies that devices in the category are automatically intended for air handling spaces.

Listed devices are evaluated using UL1565 – Standard for Positioning Devices. The scope of this standard states: “1.1 This standard applies to those metallic and nonmetallic devices used for positioning - which may include bundling and securing - to a limited extent supporting cable, wire, conduit, or tubing of a wiring system in electrical installations, to reduce the risk of fire, electric shock, or injury to persons.”

Devices are evaluated for properties that we are concerned about. It is NOT a requirement for a listed device to be evaluated for use in air handling spaces.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative: JOHNSON, S.: See my explanation of negative vote on Comment 16-27.

16-293 Log 9378 NEC-P16 Final Action: Reject (830.24)

Submitter: S. D. Kahn, Tri-City Electric Company, Inc. / Rep. NECA

Comment on Proposal No: 16-374

Recommendation: Reject the Proposal.

Substantiation: This proposal should be rejected as the term “listed” should not be introduced at this time. The panel accepted moving the abandoned cable requirement but did not accept deleting “The accessible portion of”. The panel rejected the remainder of the proposal except for adding the word “listed”.

Other proposals move the abandoned cable requirement. I agree with the submitter’s intent with reference to “listed” in order to introduce consistency, is used in plenums and other air handling spaces. Consequently, the proposal should have been subjected to the direction given by the Standards Council, as were many other proposals which were rejected because of that direction.

As Mr. Dorna noted in his “Explanation of Negative Vote”, “The UL Directory (2005), shows that category ZODZ covers “cable ties, cable tie mounts and similar types of related hardware”. Likewise, Conduit and Fittings, category DWV covers “cable ties, conduit straps, staples and similar hardware...” Both categories list as “Suitable for use in air handling spaces in accordance with Sec 300.22(C) and (D) of the National Electrical Code.”

The proposal portion that introduces “listed” should have been rejected because of the Standards Council decision concerning NFPA 90A. Code Making Panels must be consistent in their handling of all submitted proposals.

Panel Meeting Action: Reject

Panel Statement: This is not a 90A issue. The guide information for ZODZ, Wire Positioning Devices states that: “The investigation of these products includes consideration of the rated mechanical strength, maximum operating temperature, smoke and heat generation, corrosion resistance and weatherability characteristics as appropriate for the product.”

These are all characteristics that we should be concerned about for electrical installations.

The reference to air handling spaces is only a reference and is stated as: “…for those devices which have been investigated to determine their suitability for use in air handling areas...”

This is a standard statement that is found in a wide variety of listing categories including the category for IT and Telecom equipment to cover situations where a special investigation is done to evaluate a device for air handling spaces. It no way implies that devices in the category are automatically intended for air handling spaces.
Listed devices are evaluated using UL1565 – Standard for Positioning Devices. The scope of this standard states:

"1.1 This standard applies to those metallic and nonmetallic devices used for positioning - which may include bundling and securing - or to a limited extent supporting cable, wire, conduit, or tubing of a wiring system in electrical installations, to reduce the risk of fire, electric shock, or injury to persons."

The evaluation of positioning devices includes:
- Classification by mechanical strength, material, maximum temperature, and environmental conditions
- Required Markings giving critical information to the installer / inspector
- Mechanical strength tests
- Flammability classification of polymeric materials and coatings (NOT air-handling space requirements)
- Relative thermal index
- Material requirements (including blending and substitution)
- Corrosion resistance
- Sharp edges
- Installation
- Mechanical strength
- Vibration
- Tests for mounting blocks and other mounting hardware and devices
- Environmental conditioning.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 2
Explanation of Negative:
BOYER, J.: See my explanation of negative vote on Comment 16-29.
JOHNSON, S.: See my explanation of negative vote on Comment 16-29.

The comment provided by Mr. Dorna with his negative vote references two UL categories under which cable ties and other hardware are “listed”. The correct UL category for Hardware for Support of Conduit, Tubing and Cable (UL 2239) is DWMU, not DWFV. Nevertheless, this standard and UL 1565, Positioning Devices (ZODZ) establishes a 23 kg test load for all support products for flexible conduits and cables in accordance with the requirements for primary support throughout the NEC. For cable ties, “minimum loop tensile strength” is commonly marked on packages. The 23 kg minimum for cable support is well representative of typical straps, hangers and staples listed for flexible conduit and cable support in accordance with UL 2239. Hardware for Support of Conduit, Tubing and Cable. The proposed new text will add value to inspectors in acceptance of appropriate cable ties without requiring lists. Companion proposals have been submitted for 640.6, 725.8, 770.24, 800.24 and 820.24.
16-297 Log #1552 NEC-P16 Final Action: Reject (830.24)


Comment on Proposal No: 16-377
Recommendation: Accept this proposal.

Substantiation: This proposal should be accepted. The requirement added by Panel 16 during the 2005 revision cycle is overly restrictive and inappropriate for network-powered broadband communications cables. The Fine Print Note associated with 830.24 directs the reader to the appropriate installation standards. The Panel has enhanced the Fine Print Note during this cycle by the addition of three new references covering the installation of network-powered broadband communications cables (see Proposal 16-376). These references are all that is necessary and sufficient for such cables without imposing the burdensome requirements of 300.11. Section 300.11 is directed toward power cable assemblies that are heavier and larger than network-powered broadband communications cables and does not impose a greater risk of injury if not properly installed. If the Panel continues to reject Proposal 16-373 then, at the very least, 300.11(C) should be clarified. See my companion comment on Proposal 16-377.

Panel Meeting Action: Reject
Panel Statement: Securing an additional cable to an existing cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative: BRUNSSEN, J.: This comment should have been accepted, as should the original Proposal 16-377. If the Panel continues to support the addition of the securing and supporting requirements of 300.11 then at the very least 300.11(C) should be exempted. It is clearly not applicable to network-powered broadband communications cables. For further substantiation, see my explanation of negative on Proposal 16-377 and the substantiation accompanying my Comment 16-298. Additionally, the final sentence of the panel statement is unclear.

JOHNSON, S.: See my explanation of negative vote on Comment 16-31.

JONES, R.: See my Explanation of Negative Vote on Comment 16-297.

16-299 Log #714 NEC-P16 Final Action: Reject (830.24, FPN)

Submitter: Robert Kelleher, Paramount Electrical Services

Comment on Proposal No: 16-375
Recommendation: The action should be to delete this Fine Print Note.

Substantiation: The addition of these NEC Fine Print Notes, serves no benefit to the user of the National Electrical Code. These are not standards, they are a compilation of generic information and do not serve as information to the user. These must be purchased through NECA. This FPN as written is nothing more than free advertisement for generic, readily available information which must be purchased by the code user. Code Making Panel 16 should consider taking an action to delete this FPN to coordinate with the other technical committees in the NEC project. A total of seventeen new Fine Print Notes were proposed to reference NECA standards. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as "...a tool to assist untrained electricians to make safer and better installations." The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP16 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IEAI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: Proposal 16-375 pertained to updating the FPN, not to delete it.

The comment requests that the FPN be deleted. The FPN provides valuable information, and the panel intends that it be retained but the date updated. The references provided in the FPN provide guidance for installation in a neat and workmanship like manner.

See panel action and statement on Comment 16-107a (Log #CC1602).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative: PREZIOSO, L.: See my explanation of affirmative vote on Comment 16-34.

16-300 Log #879 NEC-P16 Final Action: Reject (830.24, FPN)

Submitter: John P. Masarick, Independent Electrical Contractors Inc.

Comment on Proposal No: 16-375
Recommendation: The panel is encouraged to continue to Reject Proposal 16-375.

Substantiation: The reasons to continue to Reject the Proposal are as follows:
1. The trend by the CMPs over the last several code cycles has been to limit the number of Fine Print Notes. Sixteen were unanimously rejected. Inclusion of this Fine Print Note is in direct conflict with 90.1(C). In the action to reject proposal 8-3, one technical committee member promotes NECA standards as "...a tool to assist untrained electricians to make safer and better installations." The TCC should intervene, uphold the provisions of 90.1(C) and prohibit these types of Fine Print Notes. CMP16 should reject this FPN. Failure to do so will mean adding Fine Print Notes for IEC, EEL, IEAI, ACC, NETA, NEI, SEIA, AISI, API, ASHE, AHAM, ICEAI, NYBFU and dozens of others when they decide to develop income through generic standards development. If this type of Fine Print Note is placed anywhere in the NEC an Annex should be included with coupons for the code user. If the NEC is to be used for advertisement purposes, coupons should be included.

Panel Meeting Action: Reject
Panel Statement: Proposal 16-375 pertained to updating the FPN, not to delete it.

The comment requests that the FPN be deleted. The FPN provides valuable information, and the panel intends that it be retained but the date updated. The references provided in the FPN provide guidance for installation in a neat and workmanship like manner.

See panel action and statement on Comment 16-107a (Log #CC1602).

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

Comment on Affirmative: PREZIOSO, L.: See my explanation of affirmative vote on Comment 16-34.
Panel Meeting Action: Reject
Panel Statement: The comment substantiation is inconsistent with the recommended action. The panel does not agree to delete the FPN. The panel did not delete that FPN, as the original proposal was to update the reference date.
See panel action and statement on Comment 16-107a (Log #CC1602).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative: PREZIOSO, L: See my explanation of affirmative vote on Comment 16-34.

16-301 Log #202 NEC-P16 (830.24 Exception) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-377
Recommendation: The Technical Correlating Committee notes that neither the panel statement nor the revised statement shown in the affirmative vote are responsive to the submitter’s substantiation for the recommendation. The Technical Correlating Committee directs the panel to act on the merits of the recommendation. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the comments expressed in the voting and continues to reject the proposal. The requirements of 300.11(C) are applicable to Network-Powered Broadband cables, are not overly restrictively and are appropriate.
Requiring any and all cables to be properly supported is not overly restrictive and is appropriate. Securing an additional cable to an existing properly-supported cable does not constitute support. Additional cables must be directly supported by the same structural member that supports the first cable. In such installations, the additional cable is being supported by the same structural member.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15
Comment on Affirmative: BRUNSEN, J: Proposal 16-377 should have been accepted. See my explanation of negative vote on Comment 16-298.

16-302 Log #203 NEC-P16 (830.40) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-380
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-303.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-303 Log #204 NEC-P16 (830.40(C) (New)) Final Action: Accept
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-381
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC. The panel accepts the comment expressed in the voting and acknowledges that the correct panel action was to reject, since the action on Proposal 16-369 met the submitter’s intent in a different manner.
The panel notes that the text of 830.40 is correct in the preprint with respect to Proposal 16-08.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-304 Log #1554 NEC-P16 (830.90(A)) Final Action: Accept
Comment on Proposal No: 16-383
Recommendation: Continue to reject this proposal.
Substantiation: This proposal should continue to be rejected as the existing protection practices employed by the telecommunications utilities have resulted in an exemplary safety record. The many reasons for rejecting the proposal as iterated in the Panel Statement are appropriate and support continued rejection.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-305 Log #243 NEC-P16 Final Action: Accept in Principle (830.93)
Submitter: Stanley Kaufman, CableSafe Inc.
Comment on Proposal No: 16-386
Recommendation: Accept this proposal in principle by changing 830.93 as shown below:
830.93 Grounding or Interruption of Metallic Members of Network-Powered Broadband Communications Cables.
The shield of network powered broadband communications cables used for communications or powering shall be grounded at the building or at the point of entrance or attachment of the NIU. Metallic cable members not used for communications or powering shall be grounded or interrupted by an insulating joint or equivalent device as close as practicable to the point of entrance or attachment of the NIU.
Network-powered communications cables entering buildings or attaching to buildings shall comply with (A) or (B) or (C).
(A) Entering Buildings. In installations where the network-powered communications cable enters the building, the shield shall be grounded and metallic members of the cable not used for communications or powering shall be grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.
(B) Terminating Outside of the Building. In installations where the network-powered communications cable is terminated outside of the building, the shield shall be grounded and metallic members of the cable not used for communications or powering shall be grounded or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment of the NIU.
(C) Mobile Homes.... The only change this comment suggests for the second paragraph and the FPN is to add this section title. Other proposals change the text.
Substantiation: The suggested text is an editorial clarification intended to bring this section into compliance with section 3.3.1(2) of the NEC Style Manual which states:
2. Use simple declarative sentence structure, and keep sentences short.
Writing rules in long sentences full of commas, dependent clauses, and parenthetical expressions often creates confusion and misunderstanding. The requirement can be written in two or more short sentences, expressed using a list or table, or both. The existing paragraph deals with three scenarios, 1) installations where the cable enters the building, 2) installations where the cable is terminated outside of the building and 3) cables serving mobile homes. It is clearer to deal with each scenario in a separate subsection. The current text requires grounding of a shield (if the cable has a shield) and allows interruption as an alternate to grounding for other non-current-carrying members. The suggested text retains these options.
Panel Meeting Action: Accept in Principle
Revise 830.93 to read as follows:
830.93 Grounding or Interruption of Metallic Members of Network-Powered Broadband Communications Cables.
Network-powered communications cables entering buildings or attaching to buildings shall comply with (A) or (B).
For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, shall be considered to meet the requirements of this section.
FPN: Selecting a grounding location to achieve the shortest practicable ground conductor helps limit potential differences between the network-powered broadband communications circuits and other metallic systems. (A) Entering Buildings. In installations where the network-powered communications cable enters the building, the shield shall be grounded in accordance with 830.100 and metallic members of the cable not used for communications or powering shall be grounded in accordance with 830.100, or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of entrance.

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(B) Terminating Outside of the Building. In installations where the network-powered communications cable is terminated outside of the building, the shield shall be grounded in accordance with 830.100 and metallic members of the cable not used for communications or powering shall be grounded in accordance with 830.100 or interrupted by an insulating joint or equivalent device. The grounding or interruption shall be as close as practicable to the point of attachment of the NIU.

Panel Statement: This revised text achieves the submitter's purpose with improved clarity and achieves parallelism with the text the panel accepted in Comments 16-40 and 16-126.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-306 Log #1113 NEC-P16  Final Action: Reject
(830.93, FPN (New ))
Submitter: James Daly, Upper Saddle River, NJ

Comment on Proposal No: 16-388
Recommendation: The Panel Action on the Proposal should be Reject.
Substantiation: I agree with the Explanation of Negative submitted by H. Ohde.

Also, the Technical Correlating Committee action on Proposals 16-116 and 16-117, which states in part "It is the intention of Fine Print Notes to provide explanatory information and they are not intended as a vehicle to provide unnecessary cross-references." provides a valid reason to not include the FPN.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 16-224.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-307 Log #825 NEC-P16  Final Action: Accept
(830.100(B))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-394

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. The Panel Action text addresses the change in 830.110(B), rather than the correct section of 830.100(B). This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to clarify the panel action.

The panel action on Proposal 16-394 referenced 830.110(B) in error. The correct reference is 830.100(B). See panel action and statement on Proposal 16-395 and Comment 16-308.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-308 Log #206 NEC-P16  Final Action: Accept
(830.100(B))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-395

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal with respect to the use of the word “and” in the sentence “The grounding conductor shall be connected in accordance with 830.100(B)(1), (B)(2), and (B)(3).”

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the action on Proposal 5-20. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: Revise 830.100 as follows:

“(B) Electrode. The grounding conductor shall be connected in accordance with 830.100(B)(1), (B)(2), or (B)(3).”

Revise 830.100(B)(1) as follows:

“(1) In Buildings or Structures with an Intersystem Bonding Termination. If the building or structure served has an intersystem bonding termination, the grounding conductor shall be connected to the intersystem bonding termination.”

Revise 830.100(B)(2) as follows:

“(2) In Buildings or Structures with Grounding Means. If the building or structure served has no intersystem bonding termination, the grounding conductor shall be connected to the nearest accessible location on the following.”

Revise 830.100(B)(3) as follows:

“(3) In Buildings or Structures Without Intersystem Bonding Termination or Grounding Means. If the building or structure served has no intersystem bonding termination or grounding means, as described...”.

The panel has reconsidered Proposal 16-395 in light of the panel action on Proposal 5-20 as directed by the TCC and has revised “intersystem grounding termination” to “intersystem bonding termination” as indicated in the panel action on this comment.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-309 Log #207 NEC-P16  Final Action: Accept
(830.100(B))
Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-396

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal based on the affirmative comment. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept
Panel Statement: Relocate the text to follow 830.100(B)(2)(7) and revise as follows:

“A bonding device intended to provide a termination point for the grounding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on non-removable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is non-removable.”

Panel Statement: The panel action on Proposal 16-396 to accept in principle is correct. The panel has reviewed the comment expressed in the voting and determined that the proper location of the text is 830.100(B)(2)(7), not 830.100(B)(5) as indicated in the proposal. That is where equipment (service) enclosures are discussed. The panel has also added editorial clarification as indicated in the panel action on this comment. The panel notes that the text is presently located incorrectly in the draft.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-310 Log #1525 NEC-P16  Final Action: Accept
(830.100(B))
Comment on Proposal No: 16-395

Recommendation: Continue to accept the proposal, but change the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”

Substantiation: This is a follows a correlating comment to correlating with the actions of CMP-5 taken on proposal 5-20 as directed by the TCC. CMP-5 changed the term “Intersystem Grounding Termination” to “Intersystem Bonding Termination.”

Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 16-308.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

70-581
Revise 830.106(A) as follows:

“(A) Grounding. Grounding shall comply with 830.106(A)(1) or (A)(2).”

Revise 830.106(A)(2) as follows:

“(B) Electrode. The grounding conductor shall be connected in accordance with 830.100(B)(1), B(2) or B(3).”

Ballot Results:

- Number Eligible to Vote: 15
- Ballot Results: Affirmative: 15

16-312 Log #780 NEC-P16

(A) Submitter: Technical Correlating Committee on National Electrical Code

Final Action: Accept

Comment on Proposal No: 16-401

Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal by determining whether an “and” should be used or an “or” should be used in the accepted text as follows: “shall comply with 830.106(A)(1) and (A)(2)” or “shall comply with 830.106(A)(1) or (A)(2)”. The Technical Correlating Committee also directs that consideration be given to the comments expressed in the voting. This action will be considered by the Panel as a Public Comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3.4.2 and 3.4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Revise 830.106(A) as follows:

“(A) Grounding. Grounding shall comply with 830.106(A)(1) or (A)(2).”

Revise 830.106(A)(1) as follows:

“(1) Where there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, the network-powered broadband communications cable, network interface unit, and primary protector ground shall be connected to a grounding conductor in accordance with 830.100(B)(2).”

Revise 830.106(A)(2) as follows:

“(2) Where there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) from the exterior wall of the mobile home it serves, the network-powered broadband communications cable, network interface unit, and primary protector ground shall be connected to a grounding conductor in accordance with 830.100(B)(2).”

Panel Statement: The panel has considered the comments expressed in the voting as directed by the TCC.

The panel has clarified the panel action on Proposal 16-401 with respect to the word “and”, revising 830.106(A) as indicated in the panel action on this comment. It is not the intent to accomplish the grounding connections of 830.106(A)(1) and (2) simultaneously.

The panel has considered the comment on affirmative as directed by the TCC and made the indicated revisions to the text of 830.106(A)(1) and (2) as currently contained in the draft. These revisions are consistent with the panel action on proposals affecting similar requirements in Articles 770, 800, and 820.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-313 Log #7556 NEC-P16


Final Action: Accept in Principle

Comment on Proposal No: 16-401

Recommendation: There are a number of typographical errors in the revised text as provided by the Panel. Revise the Panel’s revised text under “Panel Meeting Action” as follows:

“(A) Grounding. Grounding shall comply with 830.106(A)(1) and (A)(2).

(1) Where there is no mobile home service equipment located in sight of, and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, the network-powered broadband communications cable, network interface unit, and primary protector ground shall be connected to a ground conductor in accordance with 830.100(B)(2).”

(2) Where there is no mobile home disconnecting means grounded in accordance with 250.32 and located within sight of, and not more than 9.0 m (30 ft) from the exterior wall of the mobile home it serves, the network-powered broadband communications cable, network interface unit, and primary protector ground shall be connected to a grounding conductor in accordance with 830.100(B)(2).”

Substantiation: The text as shown in the Panel Statement and the text of 830.106(A) in the ROP draft of the 2008 NEC is incorrect. The text as revised by this comment satisfies the submitter’s intent and is consistent with the Panel action on Proposal 16-170 (800.106(A)).

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 16-312.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-314 Log #1294 NEC-P16

(A) Submitter: James M. Daly, Upper Saddle River, NJ

Final Action: Reject

Comment on Proposal No: 16-402

Recommendation: The Proposal should have been Accept in Part. Accept the addition of 830.110 but do not accept the Exception.

Substantiation: No substantiation was submitted to support the deletion of the conduit fill restrictions that apply to Chapter 3 raceways. While I support the effort to correlate similar text between articles, new material cannot be introduced without providing technical substantiation.

The first sentence in 830.110 states “installed in accordance with Chapter 3” which would include all of Chapter 3 requirements pertaining to raceways including the maximum percentage fill limitations in Chapter 9. Including the Exception introduces a conflict between the 830.110 rule and the Exception.

The fill restrictions are based on the physical limitations of being able to pull conductors or cables into raceways without damaging the conductors or cables, particularly when there are bends in the run, and to avoid conductor cable jamming. The maximum percentage fill requirements are independent of whether they are electrical conductors or not.

The maximum percentage fill requirements in Chapters 3 and 9 are an integral part of the permitted uses of the raceways contained in Chapter 3 and if broadband communications cables are to be installed in a Chapter 3 raceway, then the maximum percentage fill limitations must also apply.

Chapter 9, Table 1 permits 53 percent fill when one conductor or cable is installed in a raceway; 31 percent for two; and 40 percent for three or more.

Panel Meeting Action: Reject

Panel Statement: Throughout Article 830 low-power network-powered communications cables have the same requirements as communications cables.

The fill requirements are not applicable to communications cables.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-315 Log #1959 NEC-P16

(A) Submitter: Frederic P Hartwell, Hartwell Electrical Services, Inc.

Final Action: Reject

Comment on Proposal No: 16-408

Recommendation: Accept the proposal as submitted.

Substantiation: The submitter is well aware of the differences between circuit separation as covered in this location and as covered for adjacent snap switches. However, the CMP 9 approach will accommodate CMP 16’s requirements without disadvantaging one segment of the market. By using the term “identified” as the standard of product acceptance (See Article 100), you can have a plastic divider in a plastic box (both will be listed because nonmetallic boxes must be listed); or you have a metal divider in a steel box (the box will likely be listed but doesn’t have to be and divider probably won’t be listed.) The CMP 16 conclusion that this wording would allow a barrier to be installed such that it would void a box listing is untrue. The identification requirement means that the partitions will be covered on factory cut sheets, etc., which would be the boxes for which they were designed. You will not find a divider that will meet this standard and be usable for this application. and, in the case of nonmetallic boxes, all identified products will also be listed, so any improper barrier would provoke a citation under 110.3(B). In the case of steel boxes, the barriers will probably not be listed, but the anchoring methods are obvious to any installer and inspector, and they can easily be made secure for obvious reasons. The submitter has been an electrician for a long time, and are obvious to any installer and inspector, and they can easily be made secure.

Panel Meeting Action: Reject

Panel Statement: The listing of dividers is important given current trends and wiring methods.

“Identified” is not the same as “listed” which means that some sort of evaluation for suitability of the divider and its installation has been performed. Mounting, compatibility, material type and thickness, maintenance of spacings, etc. are all items of concern that a listing would address.
In recent years there has been a flood of devices and configurations utilizing standard outlet box dimensions and configurations for mix and matching of ac outlets, Ethernet, CATV and telecomm connectors and receptacles. There is great concern regarding the separation of circuits, “storage” of excess cabling, routing of cables through or within the box, lack of expertise related to the installation of non-power cabling, and the like.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-316 Log #9209 NEC-P16 (830.154)
Final Action: Accept

Submitter: Technical Correlating Committee on National Electrical Code
Comment on Proposal No: 16-412
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. The accepted action changes the title of old “(A)(1) FPN No. 1” to new “830.179(A)(1) FPN No. 1.”

Affirmative: 15 Negative: 3

Panel Meeting Action: Hold
Panel Statement: The proposal was editorial, seeking no changes to the fine print note. A technical change in the fine print note would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-318 Log #2301 NEC-P16 (830.179(A) FPN No. 1)
Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-416
Recommendation: The Panel Action should have been to Accept in Principle and reword FPN No. 1 to read:

Another method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in UL1685-2000 Standard for Safety for Vertical-Flame Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.” The Proposal as submitted defines the damage and specifies performance requirements.

The sentence “The smoke measurements in the test method are not applicable.” is mandatory language.

Panel Meeting Action: Hold
Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-319 Log #2302 NEC-P16 (830.179(A) FPN No. 2)
Final Action: Hold

TCC Action: The Technical Correlating Committee understands that the panel action was to Hold the Comment only.
Submitter: James Daly, Upper Saddle River, NJ
Comment on Proposal No: 16-417
Recommendation: The Panel Action should be to continue to Accept in Principle, however, FPN No. 2 should be reworded to read:

Another method of determining that the cable is resistant to the spread of fire is the UL Flame Exposure, Vertical Tray Flame Test in UL1685-2000 Standard for Safety for Vertical-Flame Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.

Substantiation: 3.1.3 of the NEC Style Manual stipulates that “Fine print notes contain explanatory information. They shall not contain requirements and shall not be written in mandatory language.”

The Proposal as submitted defines the damage and specifies performance requirements.

The sentence “The smoke measurements in the test method are not applicable.” is mandatory language.

Panel Meeting Action: Hold
Panel Statement: A technical change in the fine print note as proposed in this comment would be new material that has not had public review.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

TABLES

8-87 Log #525 NEC-P08 (Chapter 9, Table 1)
Final Action: Accept

Submitter: Dan Leaf, Seneca, SC
Comment on Proposal No: 8-200
Recommendation: Accept as revised:
A multiconductor cable or flexible cord of two or more conductors shall be treated as a single conductor for calculating conduit raceway fill.

Substantiation: Where cords are permitted or not prohibited in raceways other than conduit, this rule should also apply.

Panel Meeting Action: Accept
Proposal Eligible to Vote: 12
Ballot Results: Affirmative: 9 Negative: 3
Table 1 clearly applies to conduit and tubing and in every place in this section the term “conduit” and not “raceway” is used, with a single exception FPN No. 2 which likely is an error.

Changing Note 9 to “raceway” will mislead users and lead to possible misinterpretation and confusion in the field.

Finally, the original ROP 8-200 was to add flexible cords to Note (9). The ROC substantiation implies that the addition of flexible cords to this note should broaden the applicability to all raceways, a conclusion that is not justified by the substantiation provided.

GRIFFITH, M.: Panel action should have been to “Reject” this comment rather than “Accept.” Upon close examination of Table 1 in Chapter 9, it is apparent that the table applies to conduit (only) and not raceways in general. Note 9, therefore, should not be changed from how it now reads.

Comment on Affirmative:

BURNS, J.: I recognize the concerns of Mr. Dabe, Mr. Dwight, and Mr. Griffith for not accepting the panel action on Comment 8-87, however, Article 100 does not define “Conduit,” but does define “Raceway.” There are also other areas of the NEC that use the term “raceway” and would imply conduit; such as Table 310.15(B)(2)(a). Therefore, the panel action was correct, and I continue to vote Affirmative on the panel action.

8-87 Log #183 NEC-P08
(Chapter 9, Table 4)

Final Action: Accept

Comment on Proposal No: 8-204a

Recommendation: This Proposal should continue to be Accepted as proposed.

Substantiation: The panel’s statement indicated that it disagreed with the substantiation provided for Proposal 8-204a, which indicated that HDPE is RNC. However, prior to the separation of Article 352 for the 2005 and 2008 editions of the NEC, Type PVC, Type HDPE, and Type RTRC were each included in Article 352 as “Rigid Nonmetallic Conduit: Type RNC.” Type HDPE was first covered as a Rigid Nonmetallic Conduit in Article 397 NEC. Therefore, I do not believe that the panel’s statement on this issue is correct.

Panel Meeting Action: Accept

Panel Statement: The panel does not necessarily agree with all points of the submitter’s substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

6-72 Log #2011 NEC-P06
(Chapter 9, Table 9)

Final Action: Reject

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11
ANNEX A

1-115 Log #838 NEC-P01     Final Action: Accept in Principle (Annex A)

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 1-169
Recommendation: Reject the addition of UL 60947-1 to the product standards list. (Item 5 in the proposal recommendation)
Substantiation: This standard is a set of general rules applicable to industrial control equipment only. However, it is a horizontal standard that must be used in conjunction with other standards in the 60947 series (e.g. 60947-5-1). None of these other standards have been added to the list. As such, it is inappropriate to add the horizontal standard because it has no application and is misleading to indicate that a listing can be completed to that standard only.

In addition, although the title proposed for this standard reflects the title used by UL, it is misleading in this context. The title is Low-Voltage Switchgear and Controlgear. However, the UL adoption is for control products only. Since the list in Annex A does not have (and wasn’t intended to have) a cross reference to specific NEC sections, the title implies that the standard is used for LV switchgear as well. This, of course, is incorrect.

Panel Meeting Action: Accept in Principle
The panel replaces the reference to “UL 60947-1” with “UL 60947-4-1, Electromechanical Contactors and Motor-Starters”.
Panel Statement: The submitter is correct that UL 60947-1 is a horizontal standard, containing requirements that are applicable to a broad range of switchgear and controlgear. UL 60947-1 itself is not used alone to list equipment. As is the case with many standards harmonized with IEC standards, UL 60947-1 is supplemented by many daughter standards that apply to specific product types and include inherent references to the applicable requirements of UL 60947-1. One of these daughter standards, UL 60947-4-1, Electromechanical Contactors and Motor-Starters, has a very specific scope that is relevant for users of the Code and is a valid alternative for UL 508, which is referenced in Annex A.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

ANNEX G ADMINISTRATION AND ENFORCEMENT

20-17a Log #CC2005 NEC-P20     Final Action: Accept (Annex G)

TCC Action: The Technical Correlating Committee directs that the following text be added to Annex G, after the title, to read as follows: “This annex is not a part of the requirements of this NFPA document, but is included for informational purposes only.”

The Technical Correlating Committee directs that a new FPN No. 7 be added to the Scope of the Article that reads: “FPN No. 7: See Annex G for information on Supervisory Control and Data Acquisition”.
Submitter: Code-Making Panel 20,
Comment on Proposal No: 20-1
Recommendation: Place the text on testing and maintenance of SCADA systems shown in 585.6(F) of Proposal 20-1 (page 70-616 in the Report on Proposals) in Annex I as shown in the panel meeting action on Proposal 20-1 (page 70-624 in the Report on Proposals). The text will be identified as 585.60(D) in Annex I. The text is as follows:
(D) Maintenance and Testing. SCADA systems shall be maintained and tested periodically under actual or simulated contingency conditions.
(1) Maintenance. The maintenance program for SCADA systems shall consist of the following components:
(1) Shall have a documented Preventive Maintenance program.
(2) Shall have concurrent maintenance capabilities, so that the testing, troubleshooting, repair, and/or replacement of a component or subsystem while redundant component(s) or subsystem(s) are serving the load.
(3) Operational data shall be retained – the deleted material goes well beyond requirements to ensure proper maintenance and operation.
(2) Testing, SCADA systems shall be tested periodically under actual or simulated contingency conditions.
FPN No. 1: Periodic system testing procedures can duplicate or be derived from the recommended functional performance testing procedures of individual components, as provided by the manufacturers.
FPN No. 2: For more information on Maintenance and Testing of SCADA, see NFPA 70B-2002, Recommended Practice for Electrical Equipment Maintenance.
Substantiation: The text was deleted from 585.6(F) in the panel meeting action and was supposed to be relocated to the informational Annex I covering SCADA systems as shown in the panel meeting action on Proposal 20-1. This comment corrects that inadvertent omission.
Panel Meeting Action: Accept
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16