

2012 Fall Revision Cycle

Report on Proposals

A compilation of NFPA® Technical Committee Reports on Proposals for public review and comment

Public Comment Deadline: March 2, 2012

NOTE: The proposed NFPA documents addressed in this Report on Proposals (ROP) and in a follow-up Report on Comments (ROC) will only be presented for action at the NFPA June 2013 Association Technical Meeting to be held June 10–13, 2013, at the McCormick Place Convention Center, Chicago, IL, when proper Amending Motions have been submitted to the NFPA by the deadline of October 5, 2012. Documents that receive no motions will not be presented at the meeting and instead will be forwarded directly to the Standards Council for action on issuance. For more information on the 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.



National Fire Protection Association®

1 BATTERYMARCH PARK, QUINCY, MA 02169-7471

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 (Regs)*. 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*. Most of these rules and regulations are contained in the *NFPA Directory*. For copies of the *Directory*, contact Codes and Standards Administration at NFPA Headquarters; all 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. The Technical Committee Report is defined as “the Report of the Technical Committee and Technical Correlating Committee (if any) on a document. A Technical Committee Report consists of the Report on Proposals (ROP), as modified by the Report on Comments (ROC), published by the Association.”

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.” 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).” 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 *Regs* 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 *Regs* 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 (NITMAM) 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 *Regs*). Time constraints for filing an appeal must be in accordance with 1.6.2 of the *Regs*. 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 75 days from the date of the recommendation from the Association Technical Meeting, unless this period is extended by the Council (see 4.8 of *Regs*). 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 4.5.6 and 4.8 of *Regs*).

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 *Regs*.

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.

2012 Fall Revision Cycle ROP Contents

by NFPA Numerical Designation

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70B	P	Recommended Practice for Electrical Equipment Maintenance.....	70B-1
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289	P	Standard Method of Fire Test for Individual Fuel Packages.....	289-1
290	P	Standard for Fire Testing of Passive Protection Materials for Use on LP-Gas Containers.....	290-1
495	P	Explosive Materials Code.....	495-1
496	P	Standard for Purged and Pressurized Enclosures for Electrical Equipment.....	496-1
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1851	P	Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting	1851-1
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TYPES OF ACTION

P Partial Revision

N New Document

R Reconfirmation

W Withdrawal

**2012 Fall Revision Cycle ROP
Committees Reporting**

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Explosion Protection Systems		
67 Guideline on Explosion Protection for Gaseous Mixtures in Pipe Systems	N	67-1
68 Standard on Explosion Protection by Deflagration Venting	P	68-1
Explosives		
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498 Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives	P	498-1
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Emergency Medical Services Protective Clothing and Equipment		
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1852 Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)	P	1852-1
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Special Operations Protective Clothing and Equipment		
1855 Standard on Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents	N	1855-1
Structural and Proximity Fire Fighting Protective Clothing and Equipment		
1851 Standard for Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting	P	1851-1
Fire Hose		
1962 Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose	P	1962-1
1964 Standard for Spray Nozzles	P	1964-1
Fire Protection for Nuclear Facilities		
801 Standard for Fire Protection for Facilities Handling Radioactive Materials	P	801-1
Fire Risk Assessment Methods		
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Fire Service Training			
1404	Standard for Fire Service Respiratory Protection Training	P	1404-1
1451	Standard for a Fire Service Vehicle Operations Training Program	P	1451-1
Fire Tests			
259	Standard Test Method for Potential Heat of Building Materials	P	259-1
260	Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture	P	260-1
261	Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes	P	261-1
270	Standard Test Method for Measurement of Smoke Obscuration Using a Conical Radiant Source in a Single Closed Chamber	P	270-1
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505	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations	P	505-1
Manufactured Housing			
225	Model Manufactured Home Installation Standard	P	225-1
501	Standard on Manufactured Housing	P	501-1
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FORM FOR COMMENT ON NFPA REPORT ON PROPOSALS
2012 Fall Revision CYCLE
FINAL DATE FOR RECEIPT OF COMMENTS: 5:00 pm EDT, March 2, 2012

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249 or visit www.nfpa.org/codes.

For technical assistance, please call NFPA at 1-800-344-3555.

FOR OFFICE USE ONLY

Log #: _____

Date Rec'd: _____

Please indicate in which format you wish to receive your ROP/ROC electronic paper download
(Note: If choosing the download option, you must view the ROP/ROC from our website; no copy will be sent to you.)

Date 8/1/200X Name John B. Smith Tel. No. 253-555-1234

Company _____ Email _____

Street Address 9 Seattle St. City Tacoma State WA Zip 98402

***If you wish to receive a hard copy, a street address MUST be provided. Deliveries cannot be made to PO boxes.

Please indicate organization represented (if any) Fire Marshals Assn. of North America

1. (a) NFPA Document Title National Fire Alarm Code NFPA No. & Year NFPA 72, 200X ed.

(b) Section/Paragraph 4.4.1.1

2. Comment on Proposal No. (from ROP): 72-7

3. Comment Recommends (check one): new text revised text deleted text

4. Comment (include proposed new or revised wording, or identification of wording to be deleted): [Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

Delete exception.

5. **Statement of Problem and Substantiation for Comment:** (Note: State the problem that would be resolved by your recommendation; give the specific reason for your Comment, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

A properly installed and maintained system should be free of ground faults. The occurrence of one or more ground faults should be required to cause a 'trouble' signal because it indicates a condition that could contribute to future malfunction of the system. Ground fault protection has been widely available on these systems for years and its cost is negligible. Requiring it on all systems will promote better installations, maintenance and reliability.

6. Copyright Assignment

(a) I am the author of the text or other material (such as illustrations, graphs) proposed in the Comment.

(b) Some or all of the text or other material proposed in this Comment was not authored by me. Its source is as follows: (please identify which material and provide complete information on its source)

I hereby grant and assign to the NFPA all and full rights in copyright in this Comment and understand that I acquire no rights in any publication of NFPA in which this Comment in this or another similar or analogous form is used. Except to the extent that I do not have authority to make an assignment in materials that I have identified in (b) above, I hereby warrant that I am the author of this Comment and that I have full power and authority to enter into this assignment.

Signature (Required)

John B. Smith

PLEASE USE SEPARATE FORM FOR EACH COMMENT

Mail to: Secretary, Standards Council · National Fire Protection Association
1 Batterymarch Park · Quincy, MA 02169-7471 OR
Fax to: (617) 770-3500 OR Email to: proposals_comments@nfpa.org

SAMPLE

FORM FOR COMMENT ON NFPA REPORT ON PROPOSALS
2012 Fall Revision CYCLE
FINAL DATE FOR RECEIPT OF COMMENTS: 5:00 pm EDT, March 2, 2012

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249 or visit www.nfpa.org/codes.

For technical assistance, please call NFPA at 1-800-344-3555.

FOR OFFICE USE ONLY

Log #: _____

Date Rec'd: _____

Please indicate in which format you wish to receive your ROP/ROC electronic paper download
(Note: If choosing the download option, you must view the ROP/ROC from our website; no copy will be sent to you.)

Date _____ Name _____ Tel. No. _____

Company _____ Email _____

Street Address _____ City _____ State _____ Zip _____

*****If you wish to receive a hard copy, a street address MUST be provided. Deliveries cannot be made to PO boxes.**

Please indicate organization represented (if any) _____

1. (a) NFPA Document Title _____ NFPA No. & Year _____

(b) Section/Paragraph _____

2. Comment on Proposal No. (from ROP): _____

3. Comment Recommends (check one): new text revised text deleted text

4. Comment (include proposed new or revised wording, or identification of wording to be deleted): [Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

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(a) I am the author of the text or other material (such as illustrations, graphs) proposed in the Comment.

(b) Some or all of the text or other material proposed in this Comment was not authored by me. Its source is as follows: (please identify which material and provide complete information on its source)

I hereby grant and assign to the NFPA all and full rights in copyright in this Comment and understand that I acquire no rights in any publication of NFPA in which this Comment in this or another similar or analogous form is used. Except to the extent that I do not have authority to make an assignment in materials that I have identified in (b) above, I hereby warrant that I am the author of this Comment and that I have full power and authority to enter into this assignment.

Signature (Required) _____

PLEASE USE SEPARATE FORM FOR EACH COMMENT

Mail to: Secretary, Standards Council · National Fire Protection Association
1 Batterymarch Park · Quincy, MA 02169-7471 OR
Fax to: (617) 770-3500 OR Email to: proposals_comments@nfpa.org

COMMITTEE MEMBER CLASSIFICATIONS^{1,2,3,4}

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.

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, Report goes forward. Lacking two-thirds approval, Report returns to Committee.

▼ Report on Comments (ROC) is published for public review.

Step 4 Association Technical Meeting

▼ “*Notices of intent to make a motion*” are filed, are reviewed, and valid motions are certified for presentation at the Association Technical Meeting. (“Consent Documents” that have no certified motions bypass the Association Technical Meeting and proceed to the Standards Council for issuance.)

▼ NFPA membership meets each June at the Association Technical Meeting 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 Association Technical 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 Association Technical Meeting that takes place at the NFPA Annual Meeting.

The Association Technical Meeting 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 an Association Technical Meeting. The following presents some of the main features of how a Report is handled.

The Filing of a Notice of Intent to Make a Motion. Before making an allowable motion at an Association Technical Meeting, 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 Association Technical Meeting.

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 Association Technical Meeting and head straight to the Standards Council for issuance. The remaining documents are then forwarded to the Association Technical Meeting for consideration of the NFPA membership.

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 Conference & Expo, 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, the NFPA Regs should be consulted.

Action on Motions at the Association Technical Meeting. In order to actually make a Certified Amending Motion at the Association Technical Meeting, 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 Association Technical Meeting 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.

Report of the Committee on

Fire and Emergency Services Protective Clothing and Equipment
(FAE-AAC)**William E. Haskell, III, Chair**

National Institute for Occupational Safety & Health, MA [E]

Eric J. Beck, SecretaryMine Safety Appliances Company, PA [M]
Rep. Compressed Gas Association

Jason L. Allen, Intertek Testing Services, NY [RT]
Leslie Anderson, US Department of Agriculture, MT [E]
Roger L. Barker, North Carolina State University, NC [SE]
Brian D. Berchtold, US Department of the Navy, DE [RT]
Steven D. Corrado, Underwriters Laboratories Inc., NC [RT]
Nicholas J. Curtis, Lion Apparel, Inc., OH [M]
Richard M. Duffy, International Association of Fire Fighters, DC [L]
Cristine Z. Fargo, International Safety Equipment Association, VA [M]
Robert A. Freese, Globe Manufacturing Company, NH [M]
Patricia A. Gleason, Safety Equipment Institute (SEI), VA [RT]
James S. Johnson, Lawrence Livermore National Laboratory, CA [RT]
David G. Matthews, Fire & Industrial (P.P.E) Ltd., United Kingdom [SE]
 Rep. International Standards Organization
Gary L. Neilson, Sparks, NV [U]
 Rep. NFPA Fire Service Section
Anthony D. Putorti, Jr., National Institute of Standards & Technology, MD [RT]
Jeffrey O. Stull, International Personnel Protection, Inc., TX [SE]
William A. Van Lent, Veridian Ltd., Inc., IA [M]
 Rep. Fire & Emergency Manufacturers & Services Association
Richard H. Young, DuPont Protection Technologies, VA [M]

Alternates

Chris Bain, Oklahoma State Firefighters Association, OK [C]
 (Voting Alt. to OSFA Rep.)
Louis Carpentier, Innotex Inc., Canada [M]
 (Alt. to William A. Van Lent)
Brandi L. Chestang, US Department of the Navy, FL [RT]
 (Alt. to Brian D. Berchtold)
Patricia A. Freeman, Globe Manufacturing Company, LLC, NH [M]
 (Alt. to Robert A. Freese)
David V. Haston, US Department of Agriculture, CA [E]
 (Alt. to Leslie Anderson)
Kimberly M. Henry, PBI Performance Products, Inc., NC [M]
 (Alt. to Richard H. Young)
Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
 (Alt. to Jason L. Allen)
Karen E. Lehtonen, Lion, OH [M]
 (Alt. to Nicholas J. Curtis)
Robin B. Royster, Underwriters Laboratories Inc., NC [RT]
 (Alt. to Steven D. Corrado)
Michael T. Rupert, Mine Safety Appliances Company, PA [M]
 (Alt. to Eric J. Beck)
Stephen R. Sanders, Safety Equipment Institute (SEI), VA [RT]
 (Alt. to Patricia A. Gleason)
Grace G. Stull, International Personnel Protection Inc., TX [SE]
 (Alt. to Jeffrey O. Stull)
Donald B. Thompson, North Carolina State University, NC [SE]
 (Alt. to Roger L. Barker)

Nonvoting

Christina M. Baxter, US Department of Defense, VA [E]
 Rep. TC on Hazardous Materials PC&E
Dean W. Cox, Fairfax County Fire & Rescue Department, VA [U]
 Rep. TC on Special Operations PC&E
Stephen J. King, Babylon, NY [SE]
 Rep. TC on Structural and Proximity Fire Fighting PC&E
Daniel N. Rossos, Portland Fire & Rescue, OR [U]
 Rep. TC on Respiratory Protection Equipment
Rick L. Swan, IAFF Local 2881/CDF Fire Fighters, CA [L]
 Rep. TC on Wildland Fire Fighting PC&E
Bruce H. Varner, Goodyear, AZ [E]
 Rep. TC on Electronic Safety Equipment

Committee Scope: This Committee shall have primary responsibility for documents on the design, performance, testing, and certification of protective clothing and protective equipment manufactured for fire and emergency services organizations and personnel, to protect against exposures encountered during emergency incident operations. This Committee shall also have the primary responsibility for documents on the selection, care, and maintenance of such protective clothing and protective equipment by fire and emergency services organizations and personnel.

Report of the Committee on

Electronic Safety Equipment (FAE-ELS)

Bruce H. Varner, Chair
Goodyear, AZ [SE]**Christina Spoons, Secretary**
Westmont Fire Department, IL [C]

Jason L. Allen, Intertek Testing Services, NY [RT]
Robert J. Athanas, FDNY/SAFE-IR, Incorporated, NY [U]
Nelson P. Bryner, National Institute of Standards & Technology, MD [RT]
John P. Campman, Grace Industries, Inc., PA [M]
Louis Chavez, Underwriters Laboratories Inc., IL [RT]
Michael G. Feely, Boston Fire Department, MA [U]
Wayne C. Haase, Summit Safety, Inc., MA [M]
William E. Haskell III, National Institute for Occupational Safety & Health, MA [E]
Jeffrey L. Hull, District of Columbia Fire & EMS Department, DC [E]
Richard Katz, Mine Safety Appliances Company, PA [M]
Michael F. McKenna, Antelope, CA [SE]
John H. Morris, ISG Infrasy, GA [M]
Lawrence M. Nyberg, Motorola Solutions Inc., IL [M]
Craig Parkulo, Tyco/Scott Health and Safety, NC [M]
Kevin M. Roche, Phoenix Fire Department, AZ [U]
Stephen R. Sanders, Safety Equipment Institute (SEI), VA [RT]
Gordon R. Sletmoe, Medford Fire-Rescue, OR [U]
Steven H. Weinstein, Honeywell Safety Products, CA [M]
 Rep. International Safety Equipment Association
Timothy W. Wolf, Scottsdale Fire Department, AZ [C]

Alternates

Craig Gestler, Mine Safety Appliances Company, PA [M]
 (Alt. to Richard Katz)
Patricia A. Gleason, Safety Equipment Institute (SEI), VA [RT]
 (Alt. to Stephen R. Sanders)
Zachary Stephen Haase, Summit Safety, Inc., MA [M]
 (Alt. to Wayne C. Haase)
John Jarboe, Grace Industries, Inc., MD [M]
 (Alt. to John P. Campman)
Robert M. Knabbe, FDNY/SAFE-IR, Incorporated, NY [U]
 (Alt. to Robert J. Athanas)
Mark Krizik, Motorola, Inc., IL [M]
 (Alt. to Lawrence M. Nyberg)
Neil P. Lakomiak, Underwriters Laboratories Inc., IL [RT]
 (Alt. to Louis Chavez)
Jeffrey L. Landis, Tyco/Scott Health and Safety, NC [M]
 (Alt. to Craig Parkulo)
David A. Little, ISG Infrasy, GA [M]
 (Alt. to John H. Morris)
Nick Luzie, Honeywell Safety Products, CA [M]
 (Alt. to Steven H. Weinstein)
Chad A. Morey, Intertek Testing Services, NY [RT]
 (Alt. to Jason L. Allen)
Timothy R. Rehak, National Institute for Occupational Safety & Health, PA [E]
 (Alt. to William E. Haskell III)
Kate A. Remley, National Institute of Standards & Technology, CO [RT]
 (Alt. to Nelson P. Bryner)
Steven D. Townsend, City of Carrollton Fire Department, TX [E]
 (Voting Alt. to Carrollton F.D. Rep.)

Committee Scope: This committee shall have primary responsibility for documents on the design, performance, testing, and certification of electronic safety equipment used by fire and emergency services personnel during emergency incident operations, and shall also have primary responsibility for documents on the selection, care, and maintenance of electronic safety equipment.

Report of the Committee on**Emergency Medical Services Protective Clothing and Equipment (FAE-EMS)**

William E. Haskell III, Chair
National Institute for Occupational Safety & Health, MA [E]

Karen E. Lehtonen, Secretary
Lion, OH [M]

Jason L. Allen, Intertek Testing Services, NY [RT]
Michael L. Aries, Town of Natick Fire Department, MA [L]
Rep. International Association of Fire Fighters
Steven D. Corrado, Underwriters Laboratories Inc., NC [RT]
James E. Davis, Columbus Firefighters Local 67, OH [L]
Todd P. Davis, Town of Longmeadow Fire Department, MA [C]
William A. Fithian, Safety Equipment Institute (SEI), VA [RT]
Daniel J. Gohlke, W. L. Gore and Associates, MD [M]
Donald F. Groce, Best Glove Inc., GA [M]
Eugene M. Novak, Jr., Commonwealth of Massachusetts, MA [E]
Richard W. Patrick, US Department of Homeland Security, MD [E]

Alternates

Nicholas J. Curtis, Lion Apparel, Inc., OH [M]
(Alt. to Karen E. Lehtonen)
Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
(Alt. to Jason L. Allen)
Angie M. Shepherd, National Institute for Occupational Safety & Health, PA [E]
(Alt. to William E. Haskell III)
Gregg A. Skelly, Underwriters Laboratories Inc., NC [RT]
(Alt. to Steven D. Corrado)

Committee Scope: This Committee shall have primary responsibility for documents on protective clothing and protective equipment, except respiratory protective equipment, that provides hand, torso, limb, and face protection for fire fighters or other emergency services responders during incidents that involve emergency medical operations. These operations include first aid, cardiopulmonary resuscitation, basis life support, advanced life support, and other medical procedures provided to patients prior to arrival at a hospital or other health care facility. Additionally, this committee shall have primary responsibility for documents on the selection, care, and maintenance of emergency medical protective clothing and protective equipment by fire and emergency services organizations and personnel.

Report of the Committee on**Respiratory Protection Equipment (FAE-RPE)**

Daniel N. Rossos, Chair
Portland Fire & Rescue, OR [U]

Steven H. Weinstein, Secretary
Honeywell Safety Products, CA [M]
Rep. International Safety Equipment Association

Heinz W. Ahlers, National Institute for Occupational Safety & Health, PA [E]
Jason L. Allen, Intertek Testing Services, NY [RT]
Christopher Anaya, Sacramento Metropolitan Fire Department, CA [C]
Rep. California State Firefighters Association
David T. Bernzweig, Columbus (OH) Division of Fire, OH [L]
Rep. Columbus Fire Fighters Union
W. Lee Birch, Luxfer Gas Cylinders, CA [M]
A. Paul Bull, Charles Town, WV [SE]
Rodney V. Colbert, Fairfax County Fire & Rescue Department, VA [U]
Brian H. Cox, Clovis Fire Department, CA [U]
Deborah L. Crisher, City of Virginia Beach Fire Department, VA [U]
Nathan Dower, Dallas Fire-Rescue Department, TX [U]
Robin R. Gainey, Jacksonville Fire Rescue Department, FL [L]
Rep. International Association of Fire Fighters
Ed Golla, TRI/Air Testing, TX [RT]
A. Ira Harkness, US Department of the Navy, FL [RT]
David V. Haston, US Department of Agriculture, CA [RT]
John Jarboe, Grace Industries, Inc., MD [M]
James S. Johnson, Lawrence Livermore National Laboratory, CA [RT]
Clint Kaller, Los Angeles County Fire Department, CA [U]
Craig Martin, Avon-ISI, GA [M]
Ian Maxwell, Interspiro AB, Sweden [M]

Stephen T. Miles, National Institute for Occupational Safety & Health, WV [E]
Rep. National Institute for Occupational Safety & Health
Ruby Ochoa, Trace Analytics LLC, TX [RT]
Jerry Phifer, Tyco/Scott Health & Safety, NC [M]
Samuel C. Pitts, US Marine Corps Systems Command, VA [E]
Michael T. Rupert, Mine Safety Appliances Company, PA [M]
Stephen R. Sanders, Safety Equipment Institute (SEI), VA [RT]
Robert Sell, Draeger Safety, Inc., PA [M]
Richard S. Tobin, Jr., Fire Department City of New York, NY [U]
Kenton D. Warner, KDW Consulting, LLC, FL [SE]

Alternates

Marshall J. Black, US Department of the Navy, FL [RT]
(Alt. to A. Ira Harkness)
John P. Campman, Grace Industries, Inc., PA [M]
(Alt. to John Jarboe)
J. Michael Carlson, TRI Air Testing, TX [RT]
(Alt. to Ed Golla)
Dennis K. Davis, US Department of Agriculture, MT [RT]
(Alt. to David V. Haston)
Beverly F. Gulledge, Tyco/Scott Safety, NC [M]
(Alt. to Jerry Phifer)
David Hodson, Draeger Safety UK Ltd., United Kingdom [M]
(Alt. to Robert Sell)
John F. Kuhn, Mine Safety Appliances Company, PA [M]
(Alt. to Michael T. Rupert)
Beth C. Lancaster, US Marine Corps Systems Command, VA [E]
(Alt. to Samuel C. Pitts)
Nick Luzie, Honeywell Safety Products, CA [M]
(Alt. to Steven H. Weinstein)
Clint Mayhue, International Safety Instruments (ISI), GA [M]
(Alt. to Craig Martin)
Chad A. Morey, Intertek Testing Services, NY [RT]
(Alt. to Jason L. Allen)
William T. Mundy, Fire Department City of New York, NY [U]
(Alt. to Richard S. Tobin, Jr.)
Kenneth A. Pravetz, City of Virginia Beach Fire Department, VA [U]
(Alt. to Deborah L. Crisher)
Timothy M. Radtke, US Department of the Interior, CO [E]
(Voting Alt. to USDOJ Rep.)
Norman Seals, Dallas Fire-Rescue Department, TX [U]
(Alt. to Nathan Dower)
Dick Smith, Trace Analytics LLC, TX [RT]
(Alt. to Ruby Ochoa)
Jonathan V. Szalajda, National Institute for Occupational Safety & Health, PA [E]
(Alt. to Heinz W. Ahlers)

Nonvoting

Matthew I. Chibbaro, US Department of Labor, DC [E]
John Steelnack, US Department of Labor, DC [E]
(Alt. to Matthew I. Chibbaro)
Rep. Occupational Safety & Health Administration

Committee Scope: This Committee shall have primary responsibility for documents on respiratory equipment, including breathing air, for fire and emergency services personnel during incidents involving hazardous or oxygen deficient atmospheres. This Committee shall also have primary responsibility for documents on the selection, care, and maintenance of respiratory protection equipment and systems by fire and emergency services organizations and personnel.

Report of the Committee on**Special Operations Protective Clothing and Equipment (FAE-SCE)**

Dean W. Cox, Chair
Fairfax County Fire & Rescue Department, VA [U]

Karen E. Lehtonen, Secretary
Lion, OH [M]

Jason L. Allen, Intertek Testing Services, NY [RT]
Collin M. Byrne, Lynchburg Police Department, VA [U]
Steven D. Corrado, Underwriters Laboratories Inc., NC [RT]
Shawn G. Davis, Essex-Windsor Emergency Medical Services, Canada [U]
Keith B. Dempsey, City of Dalton Fire Department, GA [C]
James A. Frank, CMC Rescue, Inc., CA [M]
Stephen J. Geraghty, Fire Department City of New York, NY [U]
Daniel J. Gohlke, W. L. Gore and Associates, MD [M]

William E. Haskell III, National Institute for Occupational Safety & Health, MA [E]
Diane B. Hess, PBI Performance Products, Inc., NC [M]
Gavin P. Horn, University of Illinois Fire Service Institute, IL [SE]
Steve Hudson, Pigeon Mountain Industries, Inc., GA [M]
H. Dean Paderick, Special Rescue International, VA [SE]
Jack E. Reall, Columbus (OH) Division of Fire, OH [U]
Stephen R. Sanders, Safety Equipment Institute (SEI), VA [RT]
Michael T. Stanhope, TenCate/Southern Mills, Inc., GA [M]
R. Douglas Stephenson, City of Johns Creek Fire Department, GA [U]

Alternates

Charles S. Dunn, TenCate/Southern Mills, GA [M]
 (Alt. to Michael T. Stanhope)
William A. Fithian, Safety Equipment Institute (SEI), VA [RT]
 (Alt. to Stephen R. Sanders)
Kimberly M. Henry, PBI Performance Products, Inc., NC [M]
 (Alt. to Diane B. Hess)
Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
 (Alt. to Jason L. Allen)
Kim Klaren, Fairfax County Fire & Rescue Department, VA [U]
 (Alt. to Dean W. Cox)
Loui McCurley, PMI-West, CO [M]
 (Alt. to Steve Hudson)
James E. Murray, Fire Department City of New York, NY [U]
 (Alt. to Stephen J. Geraghty)
Ashley M. Scott, Lion Apparel, Inc., OH [M]
 (Alt. to Karen E. Lehtonen)
Angie M. Shepherd, National Institute for Occupational Safety & Health, PA [E]
 (Alt. to William E. Haskell III)
Beverly Wooten Stutts, Underwriters Laboratories Inc., NC [RT]
 (Alt. to Steven D. Corrado)

Committee Scope: This Committee shall have primary responsibility for documents on special operations protective clothing and protective equipment, except respiratory equipment, that provides hand, foot, torso, limb, head, and interface protection for fire fighters and other emergency services responders during incidents involving special operations functions including, but not limited to, structural collapse, trench rescue, confined space entry, urban search and rescue, high angle/mountain rescue, vehicular extraction, swift water or flooding rescue, contaminated water diving, and air operations. This Committee shall also have primary responsibility for documents on station/work uniform garments that are not of themselves primary protective garments but can be combined with a primary protective garment to serve dual or multiple functions.

Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of special operations protective clothing and equipment by fire and emergency services organizations and personnel.

Report of the Committee on

Structural and Proximity Fire Fighting Protective Clothing and Equipment (FAE-SPF)

Stephen J. King, *Chair*
 Babylon, NY [SE]

Benjamin Mauti, *Secretary (Alternate)*
 Mine Safety Appliances Company, PA [M]
 (Alt. to John F. Rihn)

Jason L. Allen, Intertek Testing Services, NY [RT]
Roger L. Barker, North Carolina State University, NC [SE]
Brian D. Berchtold, US Department of the Navy, DE [RT]
Steven D. Corrado, Underwriters Laboratories Inc., NC [RT]
Dean W. Cox, Fairfax County Fire & Rescue Department, VA [U]
Paul F. Curtis, L.N. Curtis & Sons, CA [IM]
Rick D. Davis, National Institute of Standards & Technology, MD [RT]
Scott R. Doan, Alameda County Fire Department, CA [U]
Tim Durby, Phoenix Fire Department, AZ [U]
 Rep. International Fire Service Training Association
Richard C. Edinger, Chesterfield County Fire & Emergency Medical Services, VA [E]
 Rep. International Association of Fire Chiefs
David P. Fanning, E. D. Bullard Company, KY [M]
William A. Fithian, Safety Equipment Institute (SEI), VA [RT]

Patricia A. Freeman, Globe Manufacturing Company, LLC, NH [M]
Richard O. Granger, Jr., Charlotte Fire Department, NC [U]
William E. Haskell III, National Institute for Occupational Safety & Health, MA [E]
Emeral Earl Hayden, City of El Paso Fire Department, TX [L]
 Rep. International Association of Fire Fighters
Steve L. Lakey, Northwest Safety Clean Inc., OR [IM]
 Rep. Verified Independent Services Providers Association
Karen E. Lehtonen, Lion, OH [M]
Lance Matiste, Fire-Dex, OH [M]
Michael F. McKenna, Antelope, CA [SE]
Daniel F. Melia, Fire Department City of New York, NY [U]
Andrew R. Oliver, Gear Wash LLC, WI [IM]
Louis V. Ott, Gentex Corporation, PA [M]
Matthew D. Pegg, Brampton Fire & Emergency Services, Canada [U]
 Rep. Ontario Association of Fire Chiefs
Tom Ragan, Shelby Specialty Gloves, TN [M]
John F. Rihn, Mine Safety Appliances Company, PA [M]
R. Wendell Robison, Fillmore, UT [C]
 Rep. National Volunteer Fire Council
Kelly Sisson, City of La Mesa Fire Department, CA [U]
Douglas Sloan, Honeywell First Responder Products, NY [M]
Jeffrey O. Stull, International Personnel Protection, Inc., TX [SE]
Tim W. Tomlinson, Addison Fire Department, TX [C]

Alternates

Wells Bullard, E. D. Bullard Company, KY [M]
 (Alt. to David P. Fanning)
Nicholas J. Curtis, Lion Apparel, Inc., OH [M]
 (Alt. to Karen E. Lehtonen)
Mark J. Dolim, L.N. Curtis & Sons, CA [IM]
 (Alt. to Paul F. Curtis)
Richard C. Ford, II, Chicago Fire Department, IL [E]
 (Voting Alt. to Chicago F.D. Rep.)
A. Ira Harkness, US Department of the Navy, FL [RT]
 (Alt. to Brian D. Berchtold)
Tricia Hock, Fire-Dex, OH [M]
 (Alt. to Lance Matiste)
Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
 (Alt. to Jason L. Allen)
Kim Klaren, Fairfax County Fire & Rescue Department, VA [U]
 (Alt. to Dean W. Cox)
Michael A. Laton, Honeywell First Responder Products, GA [M]
 (Alt. to Douglas Sloan)
Anthony D. Putorti, Jr., National Institute of Standards & Technology, MD [RT]
 (Alt. to Rick D. Davis)
Robin B. Royster, Underwriters Laboratories Inc., NC [RT]
 (Alt. to Steven D. Corrado)
Angie M. Shepherd, National Institute for Occupational Safety & Health, PA [E]
 (Alt. to William E. Haskell III)
Grace G. Stull, International Personnel Protection, Inc., TX [SE]
 (Alt. to Jeffrey O. Stull)
Donald B. Thompson, North Carolina State University, NC [SE]
 (Alt. to Roger L. Barker)
Robert D. Tutterow, Jr., Charlotte Fire Department, NC [U]
 (Alt. to Richard O. Granger, Jr.)
Don Welch, II, Globe Manufacturing Company, NH [M]
 (Alt. to Patricia A. Freeman)
David K. Whiting, Columbus Division of Fire, OH [E]
 (Alt. to Richard C. Edinger)
Patrick J. Woods, Fire Department City of New York, NY [U]
 (Alt. to Daniel F. Melia)

Nonvoting

William R. Hamilton, US Department of Labor, DC [E]
Andrew Levinson, US Department of Labor, DC [E]
 (Alt. to William R. Hamilton)
 Rep. Occupational Safety & Health Administration

Staff Liaison: **David G. Trebisacci**

Committee Scope: This committee shall have primary responsibility for documents on protective ensembles, except respiratory protection, that provides head, limb, hand, foot, torso, and interface protection for fire fighters and other emergency services responders during incidents involving structural fire fighting operations or proximity fire fighting operations. Structural fire fighting operations include the activities of rescue, fire suppression, and property conservation during incidents involving fires in buildings, enclosed structures, vehicles, marine vessels, or like properties. Proximity fire fighting operations include the activities of rescue, fire suppression, and property conservation during incidents involving commercial

and military aircraft fires, bulk flammable gas fires, bulk flammable and combustible liquids fires, combustible metal fires, exotic fuel fires, and other such fires that produce very high levels of radiant heat as well as convective and conductive heat.

Additionally, this committee shall have primary responsibility for documents on the selection, care, and maintenance of structural and proximity fire fighting protective ensembles by fire and emergency services organizations and personnel.

These lists represent the membership at the time each Committee was balloted on the text of this report. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of the document.

The Report of the Committee on **Fire and Emergency Services Protective Clothing and Equipment** is presenting seven Reports for adoption, as follows:

The Reports were prepared by the:

- Technical Correlating Committee on **Fire and Emergency Services Protective Clothing and Equipment** (FAE-AAC)
- Technical Committee on Electronic Safety Equipment (FAE-ELS)
- Technical Committee on Emergency Medical Services Protective Clothing and Equipment (FAE-EMS)
- Technical Committee on Respiratory Protection Equipment (FAE-RPE)
- Technical Committee on Special Operations Protective Clothing and Equipment (FAE-SCE)
- Technical Committee on Structural and Proximity Fire Fighting Protective Clothing and Equipment (FAE-SPF)

Report I: The Technical Committee proposes for adoption, amendments to NFPA 1851, **Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting**, 2008 edition. NFPA 1851-2009 is published in Volume 13 of the 2011 National Fire Codes and in separate pamphlet form.

The report on NFPA 1851 has been submitted to letter ballot of the **Technical Committee on Structural and Proximity Fire Fighting Protective Clothing and Equipment**, which consists of 33 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Since there were no TCC Actions, there is no ballot on Part I.

Part II: 16 voted affirmatively, and 4 ballots were not returned (Bain, Barker, Duffy, Putorti).

Mr. Stull voted affirmatively stating:

The TCC heard a presentation indicating the specific needs for firefighter hygiene and cleaning off ensemble elements following specific fires; this information should be incorporated into the appendix material of NFPA 1851 (and NFPA 1855).

Report II: The Technical Committee proposes for adoption, amendments to NFPA 1852, **Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)**, 2008 edition. NFPA 1852-2008 is published in Volume 13 of the 2011 National Fire Codes and in separate pamphlet form.

The report on NFPA 1852 has been submitted to letter ballot of the **Technical Committee on Respiratory Protection Equipment**, which consists of 31 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Since there were no TCC Actions, there is no ballot on Part I.

Part II: 16 voted affirmatively, and 4 ballots were not returned (Barker, Duffy, Putorti, Bain).

Mr. Stull voted affirmatively stating: The issue of continued air quality should be reviewed as it applies to new types of pressure vessels, especially for long term storage.

Report III: The Technical Committee proposes for adoption, a new document NFPA 1855, **Standard on Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents**, 2013 edition.

The report on NFPA 1855 has been submitted to letter ballot of the **Technical Committee on Special Operations Protective Clothing and Equipment**, which consists of 19 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Part I: 15 voted affirmatively, and 5 ballots were not returned (Bain, Barker, Duffy, Neilson, Putorti).

Part II: 15 voted affirmatively, and 5 ballots were not returned (Bain, Barker, Duffy, Neilson, Putorti).

Mr. Stull voted affirmatively stating: The TCC was informed of new research that shows the hazards of skin contamination that can be attenuated by improved firefighter post scene hygiene and the proper cleaning of ensemble elements. This information should be incorporated into the appendix of NFPA 1855 (and NFPA 1851).

Report IV: The Technical Committee proposes for adoption, amendments to NFPA 1981, **Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services**, 2007 edition. NFPA 1981-2007 is published in Volume 14 of the 2011 National Fire Codes and in separate pamphlet form.

The report on NFPA 1981 has been submitted to letter ballot of the **Technical Committee on Respiratory Protection Equipment**, which consists of 31 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Part I: 14 voted affirmatively, 2 negatively after circulation of negative ballots (Berchtold, Haston), and 4 ballots were not returned (Bain, Barker, Neilson, Putorti).

Mr. Berchtold voted negatively stating:

Committee Action on proposal 1981-14 (Log #CP3), (Sections 3.3, 6.2, and 6.3) is in conflict with CFR/NIOSH/Regulations/Directives.

Mr. Haston voted negatively stating:

The TCC actions for proposals 1981-7 (Log #CP1) and 1981-26 (Log #CP7) do not appear to be correlation issues. Both TCC actions involve a considerable amount of new material which was not available for public review during ROP.

The TCC direction circumvents the ROP process and is not an appropriate means of adding new material or making major revisions. Public proposals should have been submitted, this TCC direction demonstrates a lack of respect for the process.

Part II: 16 voted affirmatively, and 4 ballots were not returned (Bain, Barker, Neilson, Putorti).

Report V: The Technical Committee proposes for adoption, amendments to NFPA 1982, **Standard on Personal Alert Safety Systems (PASS)**, 2007 edition. NFPA 1982 is published in Volume 14 of the 2011 National Fire Codes and in separate pamphlet form.

The report on NFPA 1982 has been submitted to letter ballot of the **Technical Committee on Electronic Safety Equipment**, which consists of 22 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Since there were no TCC Actions, there is no ballot on Part I.

Part II: 16 voted affirmatively, and 4 ballots were not returned (Bain, Barker, Duffy, Putorti).

Report VI: The Technical Committee proposes for adoption, amendments to NFPA 1989, **Standard on Breathing Air Quality for Emergency Services Respiratory Protection**, 2008 edition. NFPA 1989-2008 is published in Volume 14 of the 2011 National Fire Codes and in separate pamphlet form.

The report on NFPA 1989 has been submitted to letter ballot of the **Technical Committee on Respiratory Protection Equipment**, which consists of 31 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Part I: 16 voted affirmatively, and 4 ballots were not returned (Bain, Barker, Duffy, Putorti).

Part II: 16 voted affirmatively, and 4 ballots were not returned (Bain, Barker, Duffy, Putorti).

Report VII: The Technical Committee proposes for adoption, amendments to NFPA 1999, **Standard on Protective Clothing for Emergency Medical Operations**, 2008 edition. NFPA 1999-2008 is published in Volume 15 of the 2011 National Fire Codes and in separate pamphlet form.

The report on NFPA 1999 has been submitted to letter ballot of the **Technical Committee on Emergency Medical Services Protective Clothing and Equipment** which consists of 12 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

This Report on Proposals has also been submitted to the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment** (TCC) in two parts. Part I is a letter ballot on the TCC Actions, if any; and Part II is an informational letter ballot on the Report as a whole. The TCC, which consists of 20 voting members, voted as follows:

Part II: 15 voted affirmatively, and 5 ballots were not returned (Bain, Barker, Duffy, Neilson, Putorti).

Part II: 15 voted affirmatively, and 5 ballots were not returned (Bain, Barker, Duffy, Neilson, Putorti).

Mr. Stull voted affirmatively stating:
As identified in the committee statements the incorporation of new test methods should be predicated on the complete validation of those test methods that includes as a minimum interlaboratory testing and correlation with field performances.

1989-1 Log #CPI FAE-RPE **Final Action: Accept**
(Entire Document)

Submitter: Technical Committee on Respiratory Protection Equipment,
Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.

Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

Committee Meeting Action: Accept

Committee Statement: The technical committee reviewed the entire document to update any extracted material, and reviewed and update references to other organizations documents. Separate proposals were prepared as required.

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

Comment on Affirmative:

AHLERS, H.: There is a pagination problem with 1989 14 log 7. The committee comment on the first page of log 7 is incomplete and then is followed by the rest of the text of log 7 before the conclusion of the comment appears. I consider this an editorial comment, not an exception

1989-2 Log #CP5 FAE-RPE **Final Action: Accept**
(1.3.2 (New))

TCC Action: The TCC directs the TC to consider the following revised text in the comments stage:

1.3.2 Air supplied pipeline systems with or without a compressor or cascade and designed for fire fighter breathing use shall meet the air quality requirements specified in NFPA 1989.

Submitter: Technical Committee on Respiratory Protection Equipment,
Recommendation: Add a new section after existing paragraph 1.3.1 as shown below, and renumber remaining paragraphs in 1.3.

1.3.2 Where fire fighters encounter an air pipeline with or without a compressor or cascade, they shall take whatever action necessary to ensure the air in this system meets the air quality standards outlined in NFPA 1989.

Substantiation: The technical committee is proposing this new text to ensure that the air in other breathing air systems or components of breathing air systems comply with the requirements of NFPA 1989.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-3 Log #CP3 FAE-RPE **Final Action: Accept**
(3.3.13)

Submitter: Technical Committee on Respiratory Protection Equipment,
Recommendation: Revise text to read as follows:

3.3.13 Delete "...also known as an airline respirator..." from the first sentence.

Substantiation: Text is redundant, it appears again at the end of the definition.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-4 Log #8 FAE-RPE **Final Action: Accept**
(4.2.3)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Revise text to read as follows:

4.2.3 The accreditation body shall ensure that the laboratory has a written program for calibrating all instruments and devices used for measurement—including colorimetric tubes.

Substantiation: Problem: Remove redundant text about colorimetric tubes.

Substantiation: The section already says "...all instruments and devices..." so calling out one specific testing technique is unnecessary.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-5 Log #1 FAE-RPE **Final Action: Accept**
(5.1.3)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Revise text to read as follows:

5.1.3 The accredited testing laboratory shall test the samples for breathing air quality levels as specified in Section 5-3 5.6.

Substantiation: Problem: Wrong paragraph referenced.

Substantiation: Air quality is discussed in section 5.6. Section 5.3 is about synthetic air.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-6 Log #2 FAE-RPE **Final Action: Accept**
(5.2.2)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Revise text to read as follows:

5.2.2 The accredited testing laboratory shall test the samples for breathing air quality levels as specified in Section 5-3 5.6.

Substantiation: Problem: Wrong paragraph referenced.

Substantiation: Air quality is discussed in section 5.6. Section 5.3 is about synthetic air.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-7 Log #3 FAE-RPE **Final Action: Accept in Part**
(5.4.2.2)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Add new text to read as follows:

5.4.2.2 All air storage cylinders and receivers must be purged of any stored contaminated air, filled with air from a compressor system with air meeting this standard and tested to the requirements of Section 5.6 prior to being placed back into service.

Substantiation: Problem: Currently there is no mention in any sections of this document specifically requiring the purge, fill and testing of storage cylinders and receivers that have contaminated air.

Substantiation: Adding above text sets a minimum level of storage system maintenance and testing.

Committee Meeting Action: Accept in Part

Add new text to read as follows:

5.4.2.1 All air storage cylinders and receivers must be purged of any stored contaminated air, filled with air from a compressor system with air meeting this standard and tested to the requirements of Section 5.6 prior to being placed back into service.

Committee Statement: The technical committee accepted the proposal in part, and added the proposal as a new section 5.4.2.1.

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-8 Log #4 FAE-RPE **Final Action: Accept**
(5.5.1 and A.5.5.1)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Revise text to read as follows:

5.5.1 Quarterly Breathing air samples required for Section 5.1 Regular Periodic Testing shall be obtained directly at the point of air transfer from the breathing air system. The point of air transfer shall be any connection where breathing air cylinders or receivers are routinely filled, downstream from purification components and prior to or bypassing any storage cylinders or receivers.

A.5.5.1 The purpose of the air samples take before and after changing the filter is to verify that the compressor is producing compressed breathing that meets this standard. The purpose is not to test the quality of air stored in cascade cylinders or receivers, or to test the air at the point of transfer to SCBAs. Therefore, these samples need to be obtained from a point downstream of the air purification system (but as close to it as possible), and upstream of any air cascade storage cylinders or receivers. The purpose of the air samples taken during periodic quarterly testing is to ensure the compressor is producing compressed breathing air that meets this standard. The cascade systems or receivers that are being filled by the compressor system being tested do not need to be tested during every quarterly periodic testing cycle as long as there are required documented tests showing that the air in the cascade system meets this standard at some point and the compressor system filling the cascade or receivers has continuously met the standards required by sections 5.1 and 5.2. The quarterly samples test the compressed breathing air that is transferred to the SCBA. Therefore, these samples need to be obtained at the point of transfer to the SCBA breathing air cylinders downstream of the cascade storage cylinders or receivers.

A.5.5.2 The purpose of the air samples taken before and after changing the filter is to verify that the compressor is producing compressed breathing that meets this standard. The purpose is not to test the quality of air stored in cascade cylinders or receivers, or to test the air at the point of transfer to SCBAs. Therefore, these samples need to be obtained from a point downstream of the air purification system (but as close to it as possible), and upstream of any air cascade storage cylinders or receivers. Any time a compressor system fails to meet this standard all cascade systems and receivers supplied by the compressor must be purged, refilled with air from the compressor that has passed this specification and tested to the requirements of this standard before

being placed back into service.

Substantiation: Problem: As currently written paragraph 5.5.1 periodic quarterly testing may not find all compressors that fail this standard since air is tested at air transfer points not necessarily as produced by the compressor. The air being produced by a failed compressor would mix with residual air in the cascade and receiver and therefore could pass this standard. Also, some components such as oil mist and particulate matter could be captured within the cascade system. Eventually the contamination could become such a load that it makes it out of the air transfer point, but by then the whole system is contaminated.

Substantiation: Performing the air sampling on the compressor system prior to where the air enters a cascade or receiver would find problems at an earlier stage and therefore bring an increased level of safety to users.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-9 Log #5 FAE-RPE **Final Action:** Accept
(5.5.2)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Revise text to read as follows:

5.5.2. When changing the breathing air system's purification components, two air samples shall be taken as required by Section 5.2 Special Testing and Procedures for Maintenance Conditions.

Substantiation: Problem: As currently written it is too easy for users to not understand where to apply the information in section 5.5.2 and its subparagraphs.

Substantiation: Specific reference to the applicable paragraph numbers makes section 5.5.2 clearer to the user.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-10 Log #CP6 FAE-RPE **Final Action:** Accept
(5.7 (New))

Submitter: Technical Committee on Respiratory Protection Equipment,
Recommendation: Add a new Section 5.7 and paragraph A.5.7 as follows:

5.7 Posting Requirements.

5.7.1 The accredited testing laboratory shall provide quality assurance signage for all cylinder recharge areas utilized by the AHJ.

5.7.2 All worded portions of the sign shall be at least in English.

5.7.1.1 The quality assurance sign shall bear the following compliance statement legibly printed, and all letters and numbers shall be at least 25 mm (1 in.) in height.

"THIS BREATHING AIR HAS BEEN TESTED TO THE REQUIREMENTS OF NFPA 1989 (2013)"

5.7.3* The sign shall have an expiration date 90 days from date of air quality testing for compressed air systems, and 365 days from the date of purge and refill for storage cylinders independent of a compressed air system, and all letters and numbers shall be at least 6 mm (1/4 in.) in height.

5.7.4 The AHJ shall post the quality assurance signage in a conspicuous location within 6 feet of the compressor and/or any storage cylinders used to recharge emergency services SCBA or as a supplied air source.

A.5.7.3 Stored compressed breathing air should be replaced at least annually.

Substantiation: The technical committee believes that this proposal facilitates quality assurance for end users and alerts them to the condition or status of the breathing air system.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-11 Log #CP4 FAE-RPE **Final Action:** Accept
(7.1.6 and 7.1.6.1 (New))

Submitter: Technical Committee on Respiratory Protection Equipment,
Recommendation: Add a new paragraph 7.1.6 as follows:

7.1.6 A breathing air system that uses a flexible line to supply air to an SCBA cylinder outside of containment or to a storage cylinder/cascade system shall have an indicating dessicant dryer installed at the discharge end of that line.

7.1.6.1 The required quarterly air sample (5.1.1) shall not be taken downstream of this extra dryer.

Substantiation: Flexible lines use metal mesh or woven fiber to provide the strength to withstand the high pressure and polymeric material to actually contain the air. All polymeric materials will allow water to permeate to some extent. When air is passed through this flexible line water vapor will be added to the dry air inside the line possibly putting it over the allowed water content. This extra dryer will remove any such water vapor. The required quarterly test should be taken without the help of this extra dryer. The system itself up stream

of the flexible line must be capable of producing air that meets the water requirement.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-12 Log #CP2 FAE-RPE **Final Action:** Accept
(7.4)

Submitter: Technical Committee on Respiratory Protection Equipment,

Recommendation: Add a new 7.4.1, and renumber the subsequent paragraphs in the current section:

7.4.1 The organization shall require that all air quality test results include the name of the testing labs' accrediting body and the lab's current designation by that body.

Substantiation: Currently fire departments have no method to verify current accreditation.

Committee Meeting Action: Accept

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-13 Log #6 FAE-RPE **Final Action:** Accept in Principle
(A.5.5.3)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Add new text to read as follows:

A.5.5.3 Allowing compressed breathing air to flow through the fill hose for 1 minute will purge the line of room air and contaminants. Rubber and other polymeric materials will slowly pass water vapor through their structure by the process of permeation. The amount of water vapor that passes through under a given set of conditions is a function of the surface area of the polymeric material involved. This means a longer length of hose will admit more water vapor into the air stream than a shorter length of hose and could result in moisture levels above the requirements of this standard. Therefore, one should try to minimize using long lengths of hose (longer than ten feet). If one does need to use longer lengths of hose the hose should be stored with dry air inside and not open to the atmosphere which contains large amounts of water. Dry air in a stored hose should be under slight positive pressure. High pressure is not required and could be dangerous.

Substantiation: Problem: Some compressed air hoses can be very long such as 100 feet. If open to the atmosphere and then used they can contribute moisture to the compressed air moving through the hose. Users need to be aware that long hoses can lead to out of specification air. Users also need a suggested method to minimize the conditions that could create out of specification air.

Substantiation: In our laboratory we have seen compressed air samples from multiple customers that failed moisture tests where the source of the moisture was attributed to the use of long lengths of hose during the air sampling.

Committee Meeting Action: Accept in Principle

See Committee Action on 1989-11 (Log #CP4)

Committee Statement: The technical committee accepted the proposal in principle, and directs the reader to 1989-11 (Log #CP4)

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.

1989-14 Log #7 FAE-RPE **Final Action:** Reject
(Chapter X (New))

Submitter: Ronny J. Coleman, FireForceone

Recommendation: Add New Chapter to document – proposed title – Firefighter Breathing Air Replenishment Systems Installed in Structures

I envision this chapter consisting of essentially the following language:

Proposed Language for insertion in NFPA Standard 1989:

Definition: **Air Support Vehicle (ASV).** See Mask Services Unit.

Definition: **FBARS.** An acronym for Firefighter Breathing Air Replenishment Systems.

Definition: **Firefighter Breathing Air Replenishment System.** A complete, self-contained breathing air replenishment system permanently installed within a high-rise building or other complex structure providing a means for fire department personnel to safely and reliably refill empty self-contained breathing apparatus cylinders within close proximity to the location of the incident. FBARS are designed to be utilized under emergency conditions by emergency personnel within that building or structure.

Definition: **High-Rise Building.** A building where the floor of an occupiable story is greater than 75 ft (23 m) above the lowest level of fire department vehicle access. [5000, 2009]

Definition: **Mask Services Unit (MSU).** A fire service vehicle that has been designed to provide additional air supplies and/or repair or replacement equipment to support the use of emergency services personnel that are wearing self-contained breathing apparatus. The vehicle shall have a portable compressor capable of providing pressures required to sustain a minimum of 32 field

units. May also be designated as an air support vehicle (ASV).

Definition: SCBA. An abbreviation for self-contained breathing apparatus. An atmosphere-supplying respirator that supplies a respirable air atmosphere to the user from a breathing air source that is independent of the ambient environment and designed to be carried by the user. [1981, 2007, 3.3.39; 3.3.40]

New Chapter

X.1 General. This chapter describes the minimum requirements for the design, fabrication, engineering, installation, testing, and maintenance of a firefighter breathing air replenishment system installed within a high-rise building or other complex structure for use under emergency conditions. Where a firefighter breathing air replenishment system is installed within a high-rise building or other complex structure the requirements of this chapter shall apply.

X.1.1 Firefighter Breathing Air Replenishment System (FBARS).

Firefighter breathing air replenishment systems may be designed to operate with or without the immediate need of a fire department air support vehicle. An FBARS consists of the following elements:

1. A method for utilizing Mask Services Units/Air Support Vehicles to provide breathing air into an air standpipe system;
2. Piping that connects all of the components together into an assembly that meets the needs of air replenishment for emergency crews;
3. A method of connecting firefighter self-contained breathing apparatus worn by emergency crews into a refilling system staged within a structure;
4. Spacing and location of filling stations to reduce travel time to refill locations;
5. Criterion for onsite air supply storage;
6. Criterion for air monitoring and quality control systems;
7. Criterion for breathing air compressors;
8. Commissioning process to ensure quality control;
9. Test and measurements for ongoing air quality control.

X.1.2 Purpose. To strategically place a breathing air replenishment system in high-rise buildings or other complex structures; to allow firefighters to replenish empty breathing air cylinders within close proximity of the incident; to reduce the amount of travel distance, time and equipment needed for logistical support; and thus maximize firefighter safety and effectiveness.

X.1.3 Provisions. This system shall be considered a “life safety system” designed to provide a safe and reliable source of breathing air replenishment. Pressurized components of the FBARS shall be listed, approved and certified by a nationally recognized testing and research facility. FBARS shall meet the requirements of Chapter 5 Air Quality Requirements, Chapter 6 Test Methods, and Chapter 7 Compressed Breathing Air Systems; NFPA 70, *National Electrical Code*; NFPA 72 *National Fire Alarm and Signal Code, 2010 Edition*, Chapter 14 and 26; NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program, 2007 Edition*; NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services, 2007 Edition*; NFPA 1901 *Standard for Automotive Fire Apparatus 2009 Edition*, Chapter 24 Air Systems.

X.1.3.1 Design criteria for all pressure containing components shall be satisfied with a minimum working pressure of 5,000 PSIG at 70° F with a safety factor of 4:1.

X.1.3.2 Compressor and booster supplied systems shall be capable of storage and operation in any ambient temperature between 32°F and 110°F (0°C and 43°C).

X.1.3.3 Cascade and bulk air systems shall be capable of storage and operation in any ambient temperature between 0°F and 110°F (-18°C and 43°C).

X.1.3.4 The air system shall be designed so that it can be operated in environments with relative humidity up to and including 100 percent.

X.1.3.5 All materials used in the air system shall be corrosion resistant or treated to resist corrosion unless the finished product will be in continual contact with a noncorrosive lubricant.

X.2 Assembly and Installation Practices.

X.2.1 All electrical, low voltage and supervisory signal components, equipment, and installation procedures shall conform to NFPA 70, *National Electrical Code*; and NFPA 72 *National Fire Alarm and Signal Code, 2010 Edition*, Chapter 14 and 26;

X.2.2 All screws, pins, bolts, and other fasteners whose failure would create a hazardous condition for personnel or equipment shall be equipped with locking devices.

X.2.3 Safety wire, self-locking nuts, cotter pins, lock washers, and liquid-locking compounds shall be acceptable.

X.2.4 Each part utilized in the fabrication of the FBARS and its components shall be designed for use in compressed breathing air service at pressures, temperatures, and flow rates that will be encountered during actual air system operation.

X.2.5 Discharge air from a compressor shall pass through a purification system prior to distribution.

X.2.6 Prior to the initial air quality test and commissioning, the FBARS shall be purged with pure air until moisture and other contaminants have been removed.

X.3 Maintainability.

X.3.1 The design of the FBARS shall provide for maintainability by including, but not necessarily being limited to, the following maintainability objectives and technical and operational constraints:

X.3.2 The design shall be such that faults can be isolated to allow access to removable assemblies or components.

X.3.3 Breathing air components, mechanical joints, electrical panels and junction boxes shall be readily accessible.

X.3.4 The physical arrangement of components shall be such that they can be inspected, serviced, calibrated, and, if necessary, adjusted without being removed and with minimum disturbance to other components.

X.3.5 The design shall be such that inspection, service, and replacement can be accomplished using a minimum of special tools and support equipment.

X.3.6 Test points shall be provided to facilitate malfunction isolation and the connection of calibration and test instrumentation.

X.3.7 If special tools are required to service or maintain the breathing air system, those tools shall be supplied by the installing contractor or manufacturer.

X.4 Performance Requirements. The FBARS shall be designed to fill at the most remote air cylinder fill station, a minimum of two (2) empty 45 standard cubic foot compressed breathing air cylinders to a maximum pressure of 4,500 PSIG simultaneously in three (3) minutes or less.

X.5 Materials of Construction. All pressurized materials used in the construction shall be suitable for high pressure breathing air at minimum operations of 5,000 PSIG at 70° F with a safety factor of 4:1. All pressurized components shall meet the requirements of ANSI 331 and ASME Section III Codes. The internal service of all components shall be kept free of contamination, especially hydrocarbons, so the air contained within the system meets Chapter 5, Air Quality Requirements.

X.6 Isolation. The FBARS shall be arranged in such a way that when an Air Support Vehicle is supplying air to the system, the supply from the ASV may be isolated from on-site air storage vessels and directed to a main riser by the use of readily accessible selector valves. This will allow breathing air to be supplied directly from the air support vehicle to remote fill stations.

X.7 Components.

X.7.1 Exterior Operator Control Panel.

X.7.1.1 Systems designed for use with a Mask Services Unit (MSU) or Air Support Vehicle (ASV) shall be designed to allow the air support vehicle to interconnect with the system from an accessible exterior panel location, allowing a constant supply of air from the vehicle to the installed FBARS system.

X.7.1.2 The exterior operator control panel shall be attached to the building or on a remote monument.

X.7.1.3 The panel shall be secured inside of a weather-resistant enclosure. The enclosure shall be visible and accessible on approach to the building and shall be maintained with unobstructed view and access.

X.7.1.4 The panel location shall be approved by the AHJ.

X.7.1.5 The panel shall meet the requirements of NFPA 1901 *Standard for Automotive Fire Apparatus 2009 Edition* Chapter 24 Air Systems, Section 24.8.

X.7.2 Interior Air Cylinder Fill Station.

X.7.2.1 Air cylinder fill stations shall be inter-connected directly to the main air supply.

X.7.2.2 Air cylinder fill stations shall be located in a fire resistive enclosure directly accessible to the fire department access paths. Air cylinder fill stations shall be located such that means of egress are not obstructed.

X.7.2.3 Intermediate air cylinder fill station(s) shall be installed in a location specified by the AHJ.

X.7.2.4 Each air cylinder fill station shall have the capability of being isolated from the remainder of the system by means of isolation valves.

X.7.2.5 The interior air cylinder fill stations shall be capable of replenishing a minimum of four (4) empty 45 cubic foot, 4,500 PSIG breathing air cylinders within six (6) minutes or less. The air cylinder fill station shall provide for the refilling of breathing air cylinders

- in accordance with NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24, Air Systems Section 24.9.
- X.7.2.6** The design of the air cylinder fill station shall, in a life threatening emergency, provide for the direct refilling of breathing air cylinders by means of a discharge outlet with a minimum of one (1) cylinder filling hose that shall have a female quick connect coupling. The female coupling shall be designed to connect to a male quick connect coupling and be compatible with the fire departments SCBA apparatus. The assembled coupling shall meet the construction, performance and dimensional requirements of NFPA 1981, *Standard on Open Circuit Self-Contained Apparatus for Fire and Emergency Services*, 2002 Edition, Chapter 6, Section 6.4. The use of the discharge outlet shall be in accordance with NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2007 Edition Section 3.3.34.
- X.7.3 Interior Air Cylinder Fill Panel.**
- X.7.3.1** Air cylinder fill panels shall be inter-connected directly to the main air supply.
- X.7.3.2** Air cylinder fill panels shall be located in a fire resistive enclosure directly accessible to the fire department access paths. Air fill panels shall be located such that means of egress are not obstructed.
- X.7.3.3** Intermediate air fill panels (s) shall be installed in a location specified by the AHJ.
- X.7.3.4** Each air cylinder fill panel shall have the capability of being isolated from the remainder of the system by means of isolation valves.
- X.7.3.5** The interior air cylinder fill panel shall be capable of replenishing a minimum of two (2) empty 45 cubic feet at 4,500 psig SCBA cylinders simultaneously within three (3) minutes or less.
- X.7.3.6** Each air cylinder fill panel shall be installed in a metal cabinet constructed of minimum 18-gauge carbon steel or equivalent.
- X.7.3.7** With the exception of the shutoff valve, pressure gauges fill hoses and ancillary components all components shall be contained behind a minimum 18-gauge interior panel.
- X.7.3.8** Hinges for the cabinet door shall be located inside of the cabinet.
- X.7.3.9** A minimum of 20% of the door surface area shall be constructed of tempered glass. The thickness of the glass shall not be greater than 1/8-inch.
- X.7.3.10** The design of the cabinet shall provide a means for storing the hose to prevent kinking. When the hose is coiled, the brackets shall be installed so that the hose bend radius is maintained at 4 inches or greater.
- X.7.3.11** The design of the air cylinder fill panel shall, in a life threatening emergency, provide for the direct refilling of breathing air cylinders by means of a discharge outlet with a minimum of two (2) cylinder filling hoses that shall have a female quick connect coupling. The female coupling shall be designed to connect to a male quick connect coupling and be compatible with the fire departments SCBA apparatus. The assembled coupling shall meet the construction, performance and dimensional requirements of NFPA 1981, *Standard on Open Circuit Self-Contained Apparatus for Fire and Emergency Services*, 2007 Edition, Chapter 6, Section 6.4. The use of the discharge outlet shall be in accordance with NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2007 Edition Section 3.3.34.
- X.7.3.12** The air cylinder fill panel shall meet the requirements of NFPA 1901 *Standard for Automotive Fire Apparatus*, 2009 Edition Chapter 24 Air Systems.
- X.7.4 Air Storage System.**
- X.7.4.1** FBARS designed with on-site air storage to supply firefighters with air replenishment prior to the arrival of an air support unit shall be capable of refilling a minimum of fifty (50) empty breathing air cylinders of 45 cubic feet at 4,500 PSIG, and shall be capable of replenishing all 50 cylinders at a minimum of two (2) empty 45 cubic feet at 4,500 PSIG SCBA cylinders simultaneously within three (3) minutes or less without fire department supplementation.
- X.7.4.2** FBARS designed with on-site air storage shall meet the requirements of Chapter 5 Air Quality Requirements, NFPA 1901 *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems, Section 24.5; and breathing air quality standards of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2007 Edition.
- X.7.5 General Piping and Installation.**
- X.7.5.1** All pneumatic fittings, tubing, and hose shall be rated for the maximum allowable working pressure that could be encountered, with a test safety factor of not less than 4:1.
- X.7.5.2** All pressurized materials used in the construction of the piping distribution system shall be compatible for use with high pressure breathing air equipment and self-contained breathing apparatus.
- X.7.5.3** Tubing shall be constructed of stainless steel or other approved materials that are compatible with high pressure breathing air.
- When stainless steel tubing is used, it shall meet ASTM A-269, Grade 316 or an equal standard.
- X.7.5.4** Fittings shall be constructed of stainless steel or other approved materials that are compatible with breathing air. Stainless steel fitting shall be at least Grade 316 and meet the requirements of ASTM A-269 or an equal standard.
- X.7.5.5** All pneumatic fittings, tubing, and hose shall be corrosion resistant or treated to resist corrosion.
- X.7.5.6** All piping and tubing shall be blown clean with clean, dry air before being installed and shall be free of contamination.
- X.7.5.7** Routing of tubing and bends shall be such as to protect the tubing from mechanical damage
- X.7.5.8** All rigid tubing shall be clamped to the structure at a minimum of 48 inches, and within 4 inches on either side of a coupling or elbow.
- X.7.5.9** Rigid piping shall run in an orderly manner with a minimum of bends and Elbows
- X.7.5.10** The piping installation shall provide room for maintenance and repairs with access panels provided where applicable.
- X.7.5.11** When making up threaded piping joints, the sealant shall be applied to the thread in a manner that will prohibit entry of the sealant into the piping system
- X.7.5.12** Air connections on equipment or panels shall be provided with a threaded dust cap on a safety chain or shall be a quick disconnect-type fitting.
- X.7.5.13** All pneumatic fittings, tubing, and hose shall be located within a fire resistive enclosure and be protected from physical damage.
- X.7.5.14** Flexible hose shall be installed in such a manner as to prevent cuts, abrasions, exposure to damage, excessive temperatures and excessive bending.
- X.7.5.15** The hose shall be installed in a manner that permits removal of the hose without removal of major breathing air components or building structure components.
- X.7.5.16** All pressurized components shall meet the requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems and breathing air quality standards of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2007 Edition; and Chapters 5 Air Quality Requirements.
- X.7.6 Air Monitoring and Quality Control.**
- X.7.6.1** FBARS shall have automatic audible and visual alarms and controls at the Exterior Operator Control Panel and within the Fire Command Center to monitor the systems moisture, carbon monoxide and pressure and shall meet the requirements of NFPA 70, *National Electrical Code*; and NFPA 72 *National Fire Alarm and Signal Code*, 2010 Edition, Chapter 14 and 26.
- X.7.6.2** The monitors shall be connected to the building's fire alarm system as a supervisory alarm and shall meet the requirements of NFPA 70, *National Electrical Code*; and NFPA 72 *National Fire Alarm and Signal Code*, 2010 Edition, Chapter 14 and 26.
- X.7.6.3** The monitors shall transmit a supervisory signal when the levels of moisture exceed 24 ppm or carbon monoxide exceeds 10 ppm for breathing air in accordance with Chapter 5 Air Quality Requirements, or when the pressure of the breathing air system is less than 80% of the operating pressure.
- X.8 Breathing Air Compressor.** FBARS designed with a breathing air compressor shall meet the requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems, Section 24.3.
- X.9 Labels and Plates.** Each component and enclosure shall be identified with a label. The marking of the enclosure shall be immediately visible and accessible to emergency response personnel. Marking shall meet the requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems, Section 24.2.11.
- X.10 Documentation.**
- X.10.1** Two complete sets of plans, specifications and calculations shall be submitted to the AHJ for review and approval. Plans, specifications and calculations shall demonstrate compliance with the requirements of this chapter and shall be stamped by a Registered Design Professional. Documents shall include system calculations, manufacturer mill reports and product data specifications sheets for all components of the FBARS installation.
- X.10.2** Two complete sets of documentation that cover the operation and maintenance of the system shall be delivered with the FBARS.
- X.10.3** The documentation shall be permitted to be in printed format, electronic format, audiovisual format, or a combination thereof.
- X.10.4** Nomenclature for components, controls, and indicators shall be consistent with that used on the diagrams required in X.8 and on equipment nameplates.
- X.10.5** The manuals shall include, but not necessarily be limited to, the following:
- (1) An illustrated component list.
 - (2) A schedule of maintenance and air quality checks.

- (3) Troubleshooting information to enable a technician to locate trouble and to make repairs or adjustments to the components.
- (4) Step-by-step procedures for operating the FBARS.
- X.10.6** Documentation shall meet the requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems, Section 24.2.12.
- X.11 Training and Instruction.**
- X.11.1** If an FBARS without a compressor/ purification system is provided, the system installer shall supply a qualified person to provide operational training to fire department personnel that includes the following:
- (1) A complete system component familiarization/walkaround
 - (2) A complete review of the system and its safety features
 - (3) A review of all operation, service, and maintenance documentation
 - (4) Hands-on familiarization of the safe operation of the air control panel and air cylinder fill station/fill panel, including actual SCBA filling and other pertinent operations of the system.
- X.11.2** If an FBARS that includes a compressor/ purification system is provided, a person certified by the breathing air compressor manufacturer in the operation of the specified air compressor system shall provide training to fire department personnel that includes the following:
- (1) A review of the compressor/purification system operations and maintenance, including the operations and maintenance documentation and the name, address, and phone number of the local distributor
 - (2) Procedures to change purification cartridges
 - (3) Hands-on familiarization of the safe operation of the compressor and purification system
- X.11.3** The fire department shall designate one or two individuals to be the resource persons for all the firefighter breathing air replenishment system training and equipment indoctrination.
- X.11.4** The fire department shall designate where the training is to take place.
- X.11.5** Training shall meet the requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems, and Section 24.2.13.
- X.12 FBARS Testing and Commissioning.**
- X.12.1** Following fabrication, assembly, and installation of the FBARS, the Authority Having Jurisdiction shall witness the pneumatic testing of the complete system at a minimum test pressure of 7,500 PSIG using oil-free dry air, nitrogen or argon. A minimum twenty four (24) hour pneumatic test shall be performed. During this test all fittings, joints and system components shall be inspected for leaks.
- X.12.2** The Authority Having Jurisdiction shall witness the filling of two (2) empty 45 cubic foot at 4,500 PSIG capacity SCBA cylinders in three (3) minutes or less using compressed air supplied by fire department mobile air equipment connected to the exterior fire department connection panel. The SCBA cylinders shall be filled at the Air Fill Panel or Air Fill Station farthest from the exterior fire department connection panel.
- X.12.3** The air storage system shall be tested to confirm its ability to meet section X.3.4. This shall be accomplished by replenishing a minimum of fifty (50) empty 45 cubic feet at 4,500 psig SCBA cylinders at the uppermost air cylinder fill panel or air cylinder fill station without fire department mobile air augmentation.
- X.12.4** Before the system is placed into service, a minimum of two air samples shall be taken from separate air cylinder fill panels and /or air cylinder fill stations and submitted to an independent certified gas analysis laboratory to verify the system's cleanliness and that the air complies with the requirements for breathing air in accordance with Section 5.3. The written report of the analysis shall be submitted to the Authority Having Jurisdiction documenting that the breathing air complies with this section.
- X.12.5** A fire department representative shall be present at all testing.
- X.12.6** Testing and Commissioning shall meet the requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*, 2009 Edition, Chapter 24 Air Systems, Section 24.14.
- X.13 Security.** To prevent unauthorized access to or tampering with the FBARS system, each enclosure shall be maintained locked by a means approved by the fire department. The enclosure shall have a tamper switch connected to the building fire alarm system indicating a supervisory signal when the enclosure is opened and shall meet the requirements of NFPA 70, *National Electrical Code*; and NFPA 72 *National Fire Alarm and Signal Code*, 2010 Edition, Chapter 14 and 26;
- X.14 Annual Maintenance – Tests and Measurements.**
- X.14.1** FBARS installed in accordance with this standard shall be properly inspected, tested and maintained in accordance with this standard

to provide at least the same level of performance and protection as initially designed. The owner shall be responsible for maintaining the system and keeping the system in good working order.

X.14.2 The FBARS shall be inspected annually and certified by the installer and/or licensed mechanical engineer specializing in high pressure breathing air systems to be in proper working condition and free of defects. All components of the system shall be included in the inspection.

X.14.3 Air samples shall be taken at least quarterly to ensure the stored air meets or exceeds breathing air quality standards in accordance with Section 5.3. A copy of the report shall be submitted to the fire department.

Substantiation: I am requesting that NFPA Standard 1989 Breathing Air Quality for Fire Emergency Services Respiratory Protection add an additional chapter to deal with the development of firefighter breathing air replenishment systems that are being installed within complex structures for the purpose of replenishing firefighter air under emergency conditions.

The standard currently states that its purpose is “to establish minimum quality requirements for breathing air, including the sampling and testing methods for determining air quality.” Furthermore, section 1.2.2 states “the purpose of this standard shall also be to establish criteria for a safe supply of breathing air for fire and emergency service personnel.”

Firefighter breathing air replenishment systems are permanently installed high pressure breathing air systems designed to allow firefighters to replenish their breathing apparatus at the scene of emergencies within close proximity of the incident. These systems are built directly into the structure as a form of “air standpipe” and contain specific breathing air components that have potential impact on firefighter safety.

The NFPA 1500 standards established for SCBA breathing air replenishment within the fire station were naturally transitioned to the Mobile Air Unit in NFPA 1901, bringing the technology for breathing air replenishment closer to the site of an emergency event. This capability has now moved into the next phase by being able to provide SCBA breathing air replenishment within the complex structures themselves via the installation of a firefighter breathing air replenishment system.

A new chapter in 1989 is required to deal with the natural evolution of this relatively new application for breathing air technology. Over 75 firefighting agencies nationwide have already adopted local ordinances and incorporated these systems into a variety of risks. They include: high-rises, subways, tunnels, and mega structures. There are now over 150 known installations in place with a potential for a significant increase in these installations over the next decade. The lack of direct reference within the NFPA process has been identified as a concern. The concern is that without an adequate nationally recognized installation standard, poorly designed breathing air replenishment systems could be installed. This could compromise the safety of firefighters.

Currently there is a document that does describe these systems. That document is the IAPMO - UPC Plumbing Code, 2009 Edition, Appendix F. However, 2009 UPC Plumbing Code is not widely adopted in all of the states in which the fire service is using breathing air replenishment systems to respond to emergencies. As an example, only 14 out of 50 states adopted the UPC code in 2009. The FBARS is currently incorporated as an appendix rather than a chapter, rendering it even less effective. In many areas where local ordinances for firefighter breathing air replenishment systems (FBARS) have been adopted, Appendix F has not been adopted by the Authority Having Jurisdiction. While breathing apparatus and breathing air systems are mentioned in many NFPA Standards, i.e. 1404, 1500, 1981, 1989 and 1901, UPC Appendix F is not cross-referenced to any of the relevant NFPA Standards. There is no correlation or coordination to the NFPA Standards making process. The IAPMO Process does not have the type of firefighter representation that is present in the NFPA Standards making process. It cannot provide the type of reference that is desirable for a technology that is being installed on such a widespread basis. An NFPA document would be more appropriate to contain these requirements.

Increasing interest in this technology is raising the visibility of this need. As recent as the May-June issue of the NFPAs Journal, there was a column by Kathleen H. Almand, writing for The Fire Protection Research Foundation where she states “One of the major tasks of the NFPA’s committees and panels is to integrate new technology into our codes and standards.” This proposal is an opportunity to accomplish that integration.

If it would be beneficial, we are prepared to send a representative to the next meeting of the NFPA 1989 Committee on October 6-8th in San Diego to present documentation to support this recommendation.

Committee Meeting Action: Reject

Committee Statement: The technical committee rejected the proposal because it does not believe it is within the scope of this standard to specify the minimum requirements for the design, fabrication, engineering, installation, testing, and maintenance of a firefighter breathing air replenishment system installed within a high-rise building or other complex structure for use under emergency conditions. However, the air from these systems shall meet the requirements of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, paragraph 7.10.

Number Eligible to Vote: 31

Ballot Results: Affirmative: 27

Ballot Not Returned: 4 Dower, N., Johnson, J., Kaller, C., Radtke, T.