Committee Comment No. 319-NFPA 70-2015 [Section No. 210.12(A)]

This was a Second Revision that failed ballot.

(A) Dwelling Units.

All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets or devices installed indwelling units shall be protected by any of the means described in 210.12(A)(1) through (6):

(1) A listed combination-type arc-fault circuit interrupter, installed to provide protection of the entire branch circuit

(2) A listed branch/feeder-type AFCI installed at the origin of the branch circuit in combination with a listed outlet branch-circuit-type arc-fault circuit interrupter installed at the first outlet box on the branch circuit. The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit.

(3) A listed supplemental arc protection circuit breaker installed at the origin of the branch circuit in combination with a listed outlet branch-circuit-type arc-fault circuit interrupter installed at the first outlet box on the branch circuit where all of the following conditions are met:

(4) The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit arc-fault circuit interrupter.

(5) The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.

(6) The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit.

(7) A listed outlet branch-circuit-type arc-fault circuit interrupter installed at the first outlet on the branch circuit in combination with a listed branch-circuit overcurrent protective device where all of the following conditions are met:

(8) The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit arc-fault circuit interrupter.

(9) The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.

(10) The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit.

(11) If RMC, IMC, EMT, Type MC, or steel-armored Type AC cables meeting the requirements of 250.118, metal wireways, metal auxiliary gutters, and metal outlet and junction boxes are installed for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed outlet branch-circuit-type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

(12) Where a listed conduit or tubing or Type MC cable is encased in not less than 50 mm (2 in.) of concrete for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed outlet branch-circuit-type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

Exception: Where an individual branch circuit to a fire alarm system installed in accordance with 760.41(B) or 760.121(B) is installed in RMC, IMC, EMT, or metal wireways or auxiliary gutters or steel-sheathed cable, Type AC or Type MC, meeting the requirements of 250.118, with metal outlet and junction boxes, AFCI protection shall be permitted to be omitted.

Informational Note No. 1: For information on combination-type and branch/feeder-type arc-fault circuit interrupters, see UL 1699-~~2011~~ 2013 , *Standard for Arc-Fault Circuit Interrupters*. For information on outlet branch-circuit type arc-fault circuit interrupters, see UL Subject 1699A, *Outline of Investigation for Outlet Branch Circuit Arc-Fault Circuit-Interrupters*. ~~For information on system combination AFCIs, see UL Subject 1699C, *Outline of Investigation for System Combination Arc-Fault Circuit Interrupters* .~~

Informational Note No. 2: See 29.6.3(5) of *NFPA 72-~~2013~~ 2016* , *National Fire Alarm and Signaling Code*, for information related to secondary power-supply requirements for smoke alarms installed in dwelling units.

Informational Note No. 3: See 760.41(B) and 760.121(B) for power-supply requirements for fire alarm systems.

Submitter Information Verification

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Submittal Date: Tue Nov 10 19:22:34 EST 2015

Committee Statement

Committee Statement: The standards have been updated to the current edition. UL 1699C has been deleted since the document has been withdrawn.

Response Message:

Public Comment No. 93-NFPA 70-2015 [Section No. 210.12(A)]

Ballot Results

This item has failed ballot

15 Eligible Voters
0 Not Returned
7 Negative with Comments
3 Affirmative All
3 Affirmative with Comments
2 Abstention

Negative with Comment

Buuck, Daniel

My negative vote is based on the intent to return to the 2014 edition language for the charging paragraph only. I voted in favor of the removal of the system combination requirement at the Second Draft Meeting and continue to support that change. I also have no problems with the other changes to the section. Reasons for my position against the expansion of AFCI requirements remain the same. No data was provided for expanding the requirements of AFCI devices throughout dwelling units based on loss of life or reducing the number of fires. No proof was given to the panel that an AFCI device has prevented a fire in the past 15 years, either. Reports show that since AFCIs were introduced, they have not made a positive impact on the number of fires. Builders continue to have substantial problems with AFCI devices which add unforeseen costs to the home buyers. Expensive callbacks for repairs such as rewiring outlets for certain equipment, such as high-end vacuum cleaners or treadmills, are a major inhibitor to the acceptance of these devices.

Domitrovich, Thomas A.

While NEMA finds the revisions in 210.12(A), (A)(5), (A)(6), the exception, and the informational note acceptable, the change to (4) is not; therefore this SR should be rejected. NEMA's Public Comment 822 which requested retention of the "Listing" requirement, should have been accepted. CMP-2's panel statement for the resolution of this comment states: "The Panel is aware that this is a reduction in parallel arc protection in the home run…" There is no need for this reduction in safety! There is no technical reason to reduce the level of safety afforded by the listed solutions in the other five installation options by deleting the requirement for a listed system combination AFCI in option 4. There is a need to verify that the circuit breaker and OBC AFCI can together provide arc fault

protection for the entire branch circuit. NEMA supports the existing 2014 NEC text in 210.12(A)(4). Standard thermal-magnetic circuit breakers are not designed, tested or listed to detect and interrupt low level arcing faults. There is no NEMA circuit breaker manufacturer that supports these claims being made about their products. By not accepting this comment, the permitted AFCI protection method in 210.12(A)(4) will require the use of a standard thermal-magnetic circuit breaker to provide protection for which it is not designed, tested or Listed to provide.

Duren, Ronald E.

The listing requirement for a combination-type AFCI device has been eliminated with the removal of 210.12(A)(4)d. This action does not improve the safety of the installation.

Manche, Alan

I am voting negative on SR-319. The 210.12(A)(4) language in SR-319 will permit a system combination which consists of a standard circuit breaker and an OBC AFCI device to provide Arc Fault protection. The system combination, without a listing requirement that is being deleted from the 2014 NEC in 210.12(A)(4)(d), may not provide protection as acknowledged by the UL voting comment on FR-329 and the panel statement on PCs-439, 822 and 855. Standard thermal-magnetic circuit breakers are not designed, Listed or intended to protect against low level arcing faults as required for AFCI protection in accordance with the UL 1699 performance requirements. When the arc fault protection method in 210.12(A)(4) of SR-319 is selected as the protection means, it requires a standard thermal magnetic circuit breaker to perform a safety function for which it is not designed, tested or Listed. Circuit breakers that do not include an arc-fault protection function have not been tested or evaluated to provide protection against arcing faults. As a manufacturer of circuit breakers, an NEC requirement to use our product for which it is not intended nor listed is unacceptable and is a misapplication of our product.

Mitchem, James E.

The IEEE supports the revisions in 210.12(A), (A)(5), (A)(6), the exception and the Informational Note, but the deletion of the text in 210.12(A)(4)(d) in the 2014 edition is not acceptable. Public Comments 439, 822 and 855 calling for the reinstatement of the listed system combination AFCI requirement should have been accepted. The Panel statement for the resolution of these comments states: “The Panel is aware that this is a reduction in parallel arc protection in the home run…” There is no need for this reduction in safety! There is no technical reason to reduce the level of safety afforded by the listed solutions in the other five installation options by deleting the requirement for a listed system combination AFCI in option 4. There is a need to verify that the circuit breaker and OBC AFCI can together provide arc fault protection for the entire branch circuit. Standard thermal-magnetic circuit breakers are not designed, tested or listed to detect and interrupt low level arcing faults.

Thorwegen, Jr., Stephen J.

A standard thermal magnetic circuit breaker cannot provide arc-fault protection as in NEC 210.12. By removal of the language, the homerun circuit conductors remain unprotected in the event of an arc-fault.

Wood, Thomas H.

I am voting to not accept this revision because section 210-12(4)d has been deleted that required a branch circuit overcurrent devise to be listed to work with an AFCI devise. The panel statement in PC855 was "The panel is aware that this is a reduction in parallel arc protection in the "home run" and considers the trade off in protection, for the sake of making alternative protection devises available in the market place"

Affirmative All

Boynton, Charles L.

Harman, Thomas L.

Hilbert, Mark R.

Affirmative with Comment

Campolo, Steve

It is important to accept SR 319, which has been shown will result in increased safety and more acceptable alternatives to meet the code rule. Additionally (to my original comments below, which should remain with these new ones); I must point out the inaccuracies in the statements made by UL. Specifically, the statement “it allows any two components, with broad ranges of performance…..”, which implies OBC AFCIs have broad ranges of performance, is wrong. OBC AFCIs are held to the same performance level as AFCI breakers because they are

evaluated to the same applicable requirements of the same standard. Let's not discount the fact that OBC AFCIs' provide upstream series arc protection that extends to the circuit breaker line stab connections, which is above and beyond what is required of AFCI breakers. The whole idea of pairing OBC AFCI with mag trip breakers (and criticizing the pairing) IS NO LONGER A VIABLE ARGUMENT BECAUSE THE NMB STUDY DISCOUNTS THE MAG TRIP ISSUE ALL TOGETHER, AND SPEAKS TO THE LACK OF IGNITION EVEN AFTER A SHORT-LIVED ARC. CMP-2 understood this simple fact that removed the mag-trip response from the argument. Simply, the arcs will not ignite nearby combustibles because there are short-lived. Continuing to rely on the mag/trip argument is an error as UL's own report shows AND CMP-2 correctly stated in FR329 panel statement. However, if there is a concern with magnetic/instantaneous trip performance, and it has been discussed when considering UL listed/certified products that are evaluated with either fuses or thermal-magnetic circuit breakers during the short circuit testing. This testing relies mainly on the thermal-magnetic breakers' magnetic trip property to terminate the test. After all if magnetic trip response is going to be criticized, it should be done uniformly and investigated broadly. Original affirmative comment: CMP-2 unanimously voted in favor of SR319 which resulted from Public Comment 93, and correctly so, The Panel should maintain that position. CMP-2 has twice voted in favor of the changes made to 210.12(A)(4). Initially by producing a First Draft that eliminated the Listed System Combination requirement as there is no standard to List to, and secondly by voting to reject Public Comments to reinstate what was correctly removed in the First Revision. Additionally, the Panel correctly realized that the action of removing the Listed System Combination (and allowing a Listed OBC AFCI to meet the Code rule) will result in increased safety by allowing acceptable alternative AFCI products to be installed instead of just one type. The submitter of the Public Comment 93 that resulted in this Second Revision solely sought to correct edition dates for standards and to remove a reference to a withdrawn standard, as well as editorial correction. This is correct and appropriate and CMP-2 voted unanimously in support at the meeting. However, some panel members may choose to vote against this Second Revision now, as a vehicle to undo what the panel twice agreed to; namely, the removal of the Listed System Combination. This issue of the removal of the Listed System Combination and the Public Comments that sought to re-instate it ARE NOT up for yet a third vote. Only those editorial changes referenced in Public Comment 93 that resulted in SR319 are to be considered and the Panel should fulfill its duty in making sure that standard edition dates are up-to-date and references to non-existent standards are removed. Voting Affirmative on SR319 accomplishes this. The removal of the Listed System Combination requirement of 210.12(A)(4) is NOT RELATED whatsoever to any editorial change suggested by SR319 and should not be associated with it. Allowing SR319 to become a vehicle to reopen what the Panel has twice made its intentions clear on would be a mistake and a violation of "The Rules Governing The Development of NFPA Standards".

Coluccio, Frank

I agree with the panel

King, Donald M.

Panel 2 should give further consideration to accepting SR319. 210.12 as written in the 2014 NEC is not clear and imposes impractical criteria on the use of OBC devices that in many cases unnecessarily precludes their use. The purpose of the code is "practical safefguarding" and providing an "installation essentially free from hazard" as described in Article 90. This premise has been the foundation for many advances in technology that provide the end user with practical and reliable protection from the hazards that arise from the use of electricity. One example is the many panel deliberations that occurred regarding the reliability of circuit breakers with respect to fuses. The reliability of fuses in many fault conditions exceeds that of circuit breakers, but circuit breakers have been accepted as a practical alternative that provides an acceptable tolerance of reliability in protecting feeders and branch circuits. The same could be said for the use of OBC Arc Fault Circuit interrupters as a reliable means of meeting the requirements of 210.12. The limited run of branch circuit that is upstream from the device is effectively protected by a standard overcurrent device. Also, OBC Arc Fault Circuit Interrupters have the added benefit of protecting against series arcing faults on the line side of the branch circuit overcurrent device. Neither device provides 100% reliability. Standard overcurrent devices have an 80% reliability rating for the criterion of their use in FR329. AFCI overcurrent devices only have an 89% reliability rating for current protection. If it is the panel's intent to fully protect all branch circuits from arcing faults, then the focus should not be on arc protection devices but rather on the wiring methods used that greatly increase the risk of arcing events. Listed wiring methods are available that provide superior physical protection of the branch circuit conductors as compared to those permitted with the use of arc fault circuit interrupters. It further should be noted that this 9% delta in reliability is debated and applies to only a small portion of the branch circuit as already limited in length by 210.12 (A)4 (b) and only for parallel arcing faults and that factors such as available fault current at the service contribute to more reliable operation of the standard overcurrent device in an arcing condition.

Abstention

McGovern, William J.

There is no harm in the NEC's permitting something that does not yet exist. There have been many examples of similar permissive rules in the past. As of this writing, there is no published or proposed standard for combination AFCI/circuit breaker protection. Thus, there is little reason to vote for or against including these combinations in the Code. As a testing agency we chose to remain neutral on the subject.

Reyes, Frederick P.

UL continues to abstain on the issue of 210.12(A)(4) and need for a system combination AFCI. See our comments on FR-329 during the first draft stage. After seeing the second revision ballot comments, we again find the panel very divided on this issue of removing 210.12(A)(4)(d). Most who do not agree with the removing of 210.12(A)(4)(d) correctly note that this will result in a reduction of parallel arc protection in the home run, and therefore have voted negative on SR-319 for that reason. However, others who continue to support the removing of 210.12(A)(4)(d) appear willing to accept some level of arc protection less than that provided by a combination AFCI as a trade-off for the wider availability of alternate arc fault protection means. Both sides make valid points, however until such time as the panel can reach consensus on the definition of the acceptable level of protection and understand the risk associated with that, we will continue to abstain.

Committee Comment No. 1004-NFPA 70-2015 [New Section after 230.70(A)(3)]

This was a Second Revision that failed ballot.

(4) Service Disconnects on One- and Two-Family Dwellings.

Where installed on one-family and two-family dwellings, the service disconnecting means or remote controlled device in accordance with 230.70(A)(3) shall be installed outside the structure at the meter location, or at nearest point of entrance of the service conductors. This requirement shall take effect on July 1, 2020.

Submitter Information Verification

Submitter Full Name: CMP 4
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Submittal Date: Thu Nov 05 12:43:48 EST 2015

Committee Statement

Committee Statement: By providing an external disconnect, this allows for the safe interruption of utility power from outside the structure. The requirement for a remote controlled device allows for exterior activation of an interior device as per 230.70(A)(3).

The effective date will allow time for implementation into new products.

Response Message:

Public Comment No. 979-NFPA 70-2015 [New Section after 230.70(A)(1)]

Public Comment No. 1082-NFPA 70-2015 [Section No. 230.70(A)(1)]

Public Comment No. 1661-NFPA 70-2015 [Section No. 230.70(A)(1)]

Ballot Results

This item has failed ballot

17 Eligible Voters
0 Not Returned
5 Negative with Comments
8 Affirmative All
3 Affirmative with Comments
1 Abstention

Negative with Comment

Allison, Malcolm

This SR is intended to (1) protect firefighters by allowing them to safely and easily disconnect power from the

exterior of one and two family dwellings, and (2) provide service entrance conductor protection before the conductors enter the dwelling. NEMA agrees with the concepts of those goals in general, but the text, as written, does not provide the required practical safeguarding as described in 90.1. (1) The language permits a remote disconnect to be placed outside the dwelling and remotely trip the breaker in the load center. The communication conductors from the remote control device to the service disconnect could be involved in the fire and place the emergency responders unnecessarily in harm's way. The remote-controlled disconnect therefor should not be an option. In its place, (2) and (3) below will provide the needed relief. (2) As written, and because of the economics, the text would encourage the entire branch-circuit panelboard to be installed outdoors, where it is not in the best interest of the homeowner in many parts of the country. It is the branch-circuit circuit breakers that the homeowner normally needs to reach, whether tripping occurred due to an overcurrent, a ground-fault, or an arcing-fault. A requirement needs to be added for the enclosure containing the branch-circuit overcurrent protective devices to be located indoors. (3) For ease of local disconnection, the panelboard containing the branch-circuit circuit breakers (in (2) above) should not be a main lug-only panelboard, but rather have a main circuit breaker, a main non-fused disconnect switch, or a fused main switch. The homeowner should be able to disconnect his or her entire panelboard from inside their home, while the first responder should be able to disconnect entire service, including the service entrance conductors and the panelboard from outside the building. (4) The following is our suggested wording 230.70 (4) Service Disconnects on One- and Two-Family Dwellings. On one-family and two-family dwellings, a service disconnecting means, consisting of a circuit breaker or a fused disconnect switch, shall be installed outside the structure, at (1) the meter location or (2)the point of entrance of the service conductors. A panelboard containing the branch-circuit overcurrent protective devices located inside the structure shall contain a main circuit breaker, a main non-fused disconnect switch, or a main fused disconnect switch. This requirement shall take effect on July 1, 2020.

Buchal, Thomas E.

I do not believe that this requirement belongs in a National Standard and has potential negative ramifications with regards to premise security and ability to install a service in urban, high density areas.

McDaniel, Roger D.

Statement: We understand the benefits provided by a requirement for the service disconnect to be located outside of the structure. However, there are negative consequences such as security issues and no available space for installation with some types of construction. Therefore, we believe the requirement should be addressed in local codes and ordinances and not the NEC.

Picatti, David J.

No supporting data has been provided by the original submitter to support a change of this magnitude. This change will require that either 1) the main disconnecting means be relocated outside a one and two family dwelling or 2) a shunt trip mechanism be installed outside the home in order that the button can be used to quickly trip open a remote disconnect. One would think that if a significant hazard exists the fire department would also be concerned about all occupancies including multi-family, commercial and industrial facilities but this has been ignored by the committee and the submitter. This requirement simply adds another point of failure and significant added cost to the residential electrical system with little to no added benefit. There are many reasons why this requirement should not be placed into the NEC. First, disconnects with an "On-Off" marking will be an invitation for nuisance opening and closing of the disconnect in higher crime areas that are subject to vandals and other nefarious activities. The exterior equipment will be subject to weather degradation. Large scale homes (more than 10,000 square feet) sometimes have services that are upward of 1000 amps or more. Requiring an exterior disconnect in these cases will not be welcome sight to many homeowners. The unsubstantiated addition of 230.70(A), will increase the cost of installation, and affect low-income housing the most. On a Habitat for Humanity house, if this device costs $500, it would add approximately 8% to the cost of the electrical system. Also, the wording of this section could be interpreted to allow the service disconnect inside the building due to the wording "or at the nearest point of entrance of the service conductors". The service conductors have not entered the building if they are on the outside. Houston and other areas are moving to smart meters and probably most of the large cities have done the same. With a smart meter in place the utility company can disconnect power to the house from their central location. The standard operating procedure for the fire department should be first to notify the utility company that a house is on fire and power should be disconnected by the utility. Should this requirement be needed in certain jurisdictions those areas may add this requirement on their own.

Rogers, James J.

This comment should never have been accepted. There was no statistical analysis or technical substantiation to support changing this long standing code section. It was simply changed on the basis that it would enhance firefighter safety. One of the problems with this is that it wasn't even submitted with support from the majority of firefighter representation. This comment was submitted on behalf of IAFF which is the International Association of Firefighters which is the union representation for full time firefighters. In fact, the overwhelming majority of

firefighters in the United States are call and volunteer firefighters, 69% according to the NFPA website, and they were not involved in this submittal at all. In addition, the majority of IAFF represented firefighters are located in larger metropolitan areas of 25,000 people or more, 71% according to the NFPA website. This change if it goes into effect will only apply to 1 and 2 family dwellings the majority of which are located away from larger metropolitan areas. So in essence the IAFF has brought forward a proposed change with no statistical data that will have little effect for its members. This section of the NEC has worked very well for many decades because it allows the service disconnect to be either inside or outside whichever is better for the prevailing conditions. There are many areas of the country that mandate the service disconnect to be outside because it works best in that given area and that is fine. This change however would mandate that the service disconnect always be located outside and there are many areas of the country where this does not work. That again is why the existing language has been so successful as it is permissive to allow either not restrictive to mandate one over the other. There are many installations where it is in fact safer to install the service disconnect within the building rather than outside. Another reality that needs to be considered with this type of draconian code change is that it forces some interested parties to lobby politically to not accept the version of the NEC that contains such language. An example of this is that multiple jurisdictions across the country have not accepted updated versions of the NEC due to requirements set forth for AFCI in dwelling occupancies. I know for a fact the National Association of Home Builders is already aware of this proposed change and they are gearing up to fight against the adoption of the NEC with this language. What does that mean? That means that if they are successful all of the other work done by CMP 4 and other CMPs, such as “Rapid Shutdown” go down the drain because the NEC is not adopted. The current action being proposed in my opinion is backwards as the discussion at the meeting was to accept it with a delayed implementation and if there is sufficient public comment to then remove if before the next code cycle. It is my belief that we should do the opposite and reject this and if there is sufficient public support then a new public input should be generated for the next code cycle.

Affirmative All

Cialdea, James G.

Fries, Todd

Gibbs, Mark D.

Templet, Rebecca S.

Toomer, Ronald J.

Wills, Robert H.

Wurmlinger, Stephen P.

Zgonena, Timothy P.

Affirmative with Comment

Brooks, Bill F.

While it is understandable that the fire service would like a national approach to service entrances on one- and two-family dwellings, there are significant parts of the U.S. where this will pose problems. Particularly problematic are existing homes that need a service upgrade. This new provision could require much more expensive rework to an existing old service. The downside to this new requirement is that many homeowners in dire need of a service upgrade may postpone indefinitely that upgrade because of the increased cost. This may actually create fire hazards rather than mitigate them.

Paiss, Matthew

This provision will close a gap for allowing an NFPA70E compliant method for the emergency disconnection of service from outside the structure. Where hazardous conditions exist within a basement such as smoke, gas leaks, flooding, this will provide the safe operation by both occupant or responder to mitigate further hazards. The challenges presented to the adoption of this code are regional in nature, and as such should not be justification to adopt this as a national model code.

Whistler, Wendell R.

This change will allow for disconnection of power to a dwelling unit where the MAINS disconnect is located inside the structure. During Hurricane Katrina and Super Storm Sandy flooding in basements and cellars where the MAINS disconnect was located posed a serious hazard to individual that was trying to disconnect the power while wading through the flooded area or where a gas leak has occurred in this same area. This proposal was

requested by the Fire Service. In the Western United States the external disconnect is a common requirement of the serving utility of state or local jurisdiction.

Abstention

Bower, Ward I.

Vote Limited

Committee Comment No. 1212-NFPA 70-2015 [Section No. 250.64(A)]

This was a Second Revision that failed ballot.

(A) Aluminum or Copper-Clad Aluminum Conductors.

~~Bare~~ Grounding electrode conductors of bare, covered, or insulated aluminum or copper-clad aluminum ~~grounding electrode~~ shall comply with the following:

(1) Bare or covered conductors shall not be ~~used where~~ installed where subject to corrosive conditions or be installed in direct contact with masonry or the earth. ~~Where installed outside of a building or enclosure, aluminum or~~

(2) Terminations made within listed enclosures identified for outdoor use shall be permitted within 450 mm (18 in.) of the earth.

(3) Aluminum or copper-clad aluminum ~~grounding electrode~~ conductors external to buildings or enclosures shall not be terminated within 450 mm (18 in.) of the earth, unless ~~the termination method is~~ insulated. The termination shall be listed as a sealed wire-connector system ~~. Terminations made within listed enclosures suitable for outdoor use shall be permitted within 450 mm (18 in.) of the earth.~~ and listed as grounding and bonding equipment.

Supplemental Information

File Name	Description
SR_1212.docx	For staff use

Submitter Information Verification

Submitter Full Name: CMP 5
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Zip:
Submittal Date: Mon Nov 09 16:51:57 EST 2015

Committee Statement

Committee Statement: This subdivision was revised into a list format to improve usability. The word "covered" was added to be consistent with other sections of the NEC. The phrase "or where subject to corrosive conditions" was added to list item 1 to correct a transcription error. List item 3 was revised to replace "suitable" with "identified" as it is a defined term. The phrase "listed as grounding and bonding equipment" was added to ensure the connectors are evaluated for fault current and to allow a product to be made available.

Response Message:

Public Comment No. 789-NFPA 70-2015 [Section No. 250.64(A)]

Ballot Results

This item has failed ballot

17 Eligible Voters
0 Not Returned
14 Negative with Comments
2 Affirmative All
1 Affirmative with Comments
0 Abstention

Negative with Comment

Abernathy, Paul W.

"Covered" should not be included in 250.64(A)(1), since the encasing material protects the conductor when in contact with the earth or masonry. This requirement was added without adequate substantiation, and is in direct conflict with decades of field experience. For example, utility style underground conductors are considered "covered" by the NEC, and yet we know they can operate for decades without issue when direct buried. Additionally, in item 3, does "unless insulated" mean that the conductor has to be insulated, or the connection?

Beckstrand, Gary A.

"Covered" should not be included in 250.64(A)(1), since the encasing material protects the conductor when in contact with the earth or masonry. This requirement was added without adequate substantiation, and is in direct conflict with decades of field experience. For example, utility style underground conductors are considered "covered" by the NEC, and yet we know they can operate for decades without issue when direct buried.

Bowmer, Trevor N.

After further review of SR-1212 text and ballot comments, this SR-1212 for 250.64 (A) should be rejected. First, the "covered" conductors should not be included in 250.64(A)(1), since the encasing material protects the underlying conductor from contact with the earth or masonry. This requirement was added without adequate substantiation, and is in conflict with decades of field experience in direct buried applications of utility type underground conductors (i.e., conductors that are considered "covered" by the NEC). Secondly, in item 3 of this SR-1212 the phrase "unless insulated" is unclear as to if the conductor has to be insulated, or the connection? Therefore SR-1212 should be rejected and the first revision language shown in FR-1222 for 250.64(A) be accepted.

Brett, Jr., Martin J.

"Adding covered conductors to the restriction for aluminum conductors in this second revision was done without adequate technical substantiation or review. Covered conductors could be protected from corrosion, the purpose of the restriction, as well as insulated conductors. The substantiation for the public comment that was the basis for this Second Revision is valid. Therefore, the final language should revert back to the 2014 version and new public inputs on the subject considered for the 2020 edition."

Dobrowsky, Paul

There was no substantiation to prohibit covered conductors from being installed within 18 inches of or directly buried in the earth.

Harding, Joseph

Adding covered conductors to the restrictions for aluminum conductors in this second revision was done without adequate technical substantiation and without proper public review. The language should revert back to the 2014 text.

Harding, G. Scott

Adequate technical substantiation was not provided to restrict the use of aluminum conductors in this revision. Further, there is valid substantiation in Public Comment 789.Therefore, the best solution is to have the final language revert back to the 2014 version of the NEC.

Mello, Charles F.

The inclusion of "covered" in the new list item (1) adds restrictions in use of covered conductors without technical substation. To not lose the work completed by the panel, the text should revert back to the corrected First Revision

text as balloted by the panel as follows: (A) Aluminum or Copper-Clad Aluminum Conductors. Bare aluminum or copper-clad aluminum grounding electrode conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions. Where installed outside of a building or enclosure, aluminum or copper-clad aluminum grounding electrode conductors shall not be terminated within 450 mm (18 in.) of the earth unless the termination method is listed as a sealed wire connector system. Terminations made within listed enclosures suitable for outdoor use shall be permitted within 450 mm (18 in.) of the earth.

O'Meara, Mike

Adding covered conductors to the restrictions for aluminum conductors in this second revision was done without adequate technical substantiation and without proper public review. The committee did not intend to additionally restrict covered conductors. The language should revert back to the 2014 text.

Palmieri, Charles J.

I am voting negative on this SR the addition of the term covered is new material and was not adequately addressed at panel discussion. I believe the intent of the committee action at the First Revision was to allow termination of aluminum or copper-clad aluminum grounding electrode conductor within 18” of earth where the termination method is listed as a sealed wire-connector system. I am in favor of the editing at the Second Revision which attempted to develop a list format of this section. This process increases the usability of this section. Unfortunately I do not believe the panel gave proper consideration to the exclusion of a covered conductor in in contact with masonry or where installed in the earth

Philips, Nathan

SR 1212 adds restrictions to the use of covered conductors without adequate technical substantiation or review. Field experience has demonstrated that covered conductors are protected from corrosion as are insulated conductors. Clarifying the requirements for protection from corrosion was the purpose of this revision and the First Revision it was based on. Because the substantiation in Public Comment 789 that was the basis for this Second Revision is valid, reverting to the First Revision would introduce an error in the Code. The final language should revert back to the 2014 edition.

Porter, Christine T.

The previous edition allowed insulated or covered aluminum or copper-clad aluminum conductors to be used where in contact with masonry or earth by default as it only prohibited the use of bare aluminum or copper-clad aluminum conductors where subject to corrosive conditions or in direct contact with masonry or earth. Putting the requirements into a list format has changed the requirements. The previous edition limited terminations of aluminum within 18" of the earth. This revision should have clarified that aluminum conductors may be terminated within 18" of earth only when that termination is inside a listed enclosure or when terminated with a listed - sealed fitting in accordance with the installation instructions.

Sasso, Nick

Agree with the other panel members who voted negative. Also, the "termination shall be listed as a sealed wire-connector system" is ambiguous and not clear in meaning. Is this "termination" something that is built into the enclosure? How can a "termination" be listed..? Poorly worded.

Steinman, Gregory J.

“Covered” should not be included in 250.64(A)(1), since the encasing material protects the conductor when in contact with the earth or masonry. This requirement was added without adequate substantiation, and is in direct conflict with decades of field experience. For example, utility style underground conductors are considered “covered” by the NEC, and yet we know they can operate for decades without issue when direct buried. In item 3, does “unless insulated” mean that the conductor has to be insulated, or the connection? This should be rejected and returned to the first revision language.

Affirmative All

Helfrich, William J.

Mohla, Daleep C.

Affirmative with Comment

Simmons, Phil

The action by CMP-5 to include "covered" conductors does not introduce a new concept nor is it improper. The

definition of "Covered Conductors" has been in Article 100 for decades. it reads, "A conductor encased within material of composition or thickness that is not recognized by this Code as electrical insulation." Covering can consist of most anything including paper and provides no assurance that it provides any protection for a conductor that is in contact with the earth or masonry. So, covered conductors should be treated as bare. Bare conductors have been included in this section for many years. As covered and discussed at length by the Panel, Sealed Wire Connector Systems are covered in UL ZMWQ. These systems are intended for only insulated conductors. The UL Guide information includes the following, "Sealed wire-connector systems are intended for use with Types USE, RHW, XHHW, RW90 EP, RW90 XLPE or TWU, 30 AWG through 2000 kcmil copper or aluminum conductors with currents not exceeding the ampacity of insulated conductors rated either 75 or 90°C and intended for use at 600 V or less." If this ballot continues to fail, the language accepted at the First Revision meeting is not acceptable as it allows bare conductors in Sealed Wire Connection Systems. No documentation was provided for the reference in the voting statements to covered conductors being operated satisfactorily by electric utilities. Really?! Electric utilities are not about to directly bury power conductors that do not have a proven and reliable insulation system.

Committee Comment No. 1222-NFPA 70-2015 [Section No. 250.120(B)]

This was a Second Revision that failed ballot.

(B) Aluminum and Copper-Clad Aluminum Conductors.

Equipment grounding conductors of bare, covered, or insulated aluminum or copper-clad aluminum shall ~~be permitted. Bare~~ comply with the following:

(1) Bare or covered conductors shall not ~~come~~ be installed where subject to corrosive conditions or be installed in direct contact with masonry or the earth ~~or where subject to corrosive conditions.~~ .

(2) Terminations made within listed enclosures identified for outdoor use shall be permitted within 450 mm (18 in.) of the earth.

(3) Aluminum or copper-clad aluminum conductors external to buildings or enclosures shall not be terminated within 450 mm (18 in.) of the earth, unless ~~the termination method is~~ insulated. The termination shall be listed as a sealed wire-connector system. ~~Terminations made within listed enclosures suitable for outdoor use shall be permitted within 18 in. of the earth.~~

Submitter Information Verification

Submitter Full Name: CMP 5
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 10 14:17:32 EST 2015

Committee Statement

Committee Statement: Revisions were made to add covered conductors to provide requirements for their use. The revisions clarify the use of sealed wire connector systems and outdoor enclosures. The text is rewritten in list format to improve clarity.

Response Message:

Public Comment No. 679-NFPA 70-2015 [Section No. 250.120(B)]

Public Comment No. 791-NFPA 70-2015 [Section No. 250.120(B)]

Public Comment No. 1663-NFPA 70-2015 [Section No. 250.120(B)]

Public Comment No. 1781-NFPA 70-2015 [Section No. 250.120(B)]

Ballot Results

✖ **This item has failed ballot**

17 Eligible Voters
0 Not Returned
14 Negative with Comments
2 Affirmative All

1 Affirmative with Comments

0 Abstention

Negative with Comment

Abernathy, Paul W.

"Covered" should not be included in 250.120 (B)(1), since the encasing material protects the conductor when in contact with the earth or masonry. This requirement was added without adequate substantiation, and is in direct conflict with decades of field experience. For example, utility style underground conductors are considered "covered" by the NEC, and yet we know they can operate for decades without issue when direct buried. Additionally, in item 3, does "unless insulated" mean that the conductor has to be insulated, or the connection?

Beckstrand, Gary A.

"Covered" should not be included in 250.120 (B)(1), since the encasing material protects the conductor when in contact with the earth or masonry. This requirement was added without adequate substantiation, and is in direct conflict with decades of field experience. For example, utility style underground conductors are considered "covered" by the NEC, and yet we know they can operate for decades without issue when direct buried. In item 3, does "unless insulated" mean that the conductor has to be insulated, or the connection?

Bowmer, Trevor N.

After further review of the SR-1222 text and ballot comments, this SR-1222 should be rejected because the "covered" conductor language was added without adequate substantiation. In addition, within the proposed 250.120(B)(3), the phrase "unless insulated" is unclear as to if it refers to the conductor having to be insulated, or the connection. Such language in the new 250.120(B)(3) would unfairly preclude covered conductors from use. Therefore SR-1222 should be rejected and the first revision language shown in FR-1235 for 250.120(B) be accepted.

Brett, Jr., Martin J.

"Adding covered conductors to the restriction for aluminum conductors in this second revision was done without adequate technical substantiation or review. Covered conductors could be protected from corrosion, the purpose of the restriction, as well as insulated conductors. The substantiation for the public comment that was the basis for this Second Revision is valid. Therefore, the final language should revert back to the 2014 version and new public inputs on the subject considered for the 2020 edition."

Dobrowsky, Paul

There was no substantiation to prohibit covered conductors from being installed within 18 inches of or directly buried in the earth.

Harding, Joseph

Adding covered conductors to the restrictions for aluminum conductors in this second revision was done without adequate technical substantiation and without proper public review. The language should revert back to the 2014 text.

Harding, G. Scott

Adequate technical substantiation was not provided to restrict the use of aluminum conductors in this revision. Further, there is valid substantiation in Public Comments 679 and 791.Therefore, the best solution is to have the final language revert back to the 2014 version of the NEC.

Mello, Charles F.

The inclusion of "covered" in the new list item (1) adds restrictions in use of covered conductors without technical substation. To not lose the work completed by the panel, the text should revert back to the corrected First Revision text as balloted by the panel as follows: (B) Aluminum and Copper-Clad Aluminum Conductors. Equipment grounding conductors of bare or insulated aluminum or copperclad aluminum shall be permitted. Bare, covered or insulated conductors shall not come in direct contact with masonry or the earth or where subject to corrosive conditions. Aluminum or copper-clad aluminum conductors shall not be terminated within 450 mm (18 in.) of the earth, unless the termination method is listed as a sealed wire-connector system. Terminations made within listed enclosures suitable for outdoor use shall be permitted within 18 inches of the earth.

O'Meara, Mike

Adding covered conductors to the restrictions for aluminum conductors in this second revision was done without

adequate technical substantiation and without proper public review. The committee did not intend to additionally restrict covered conductors. The language should revert back to the 2014 text.

Palmieri, Charles J.

I am voting negative on this SR the requirement in (3) which only allows an insulated conductor to be terminated within 18” of earth by means of a listed sealed wire-connector restricts the use of bare and or covered conductors. This was not consistent with the language of FR 1235. That language was acceptable to the panel without expression of concern. The exclusion of bare and covered conductors in (3) was not fully debated.

Philips, Nathan

SR 1222 adds restrictions to the use of covered conductors without adequate technical substantiation or review. Field experience has demonstrated that covered conductors are protected from corrosion as are insulated conductors. Clarifying the requirements for protection from corrosion was the purpose of this revision and the First Revision it was based on. Because the substantiation in Public Comments 679 and 791 that were the basis for this Second Revision is valid, reverting to the First Revision would introduce an error in the Code. The final language should revert back to the 2014 edition.

Porter, Christine T.

The previous edition allowed insulated or covered aluminum or copper-clad aluminum conductors to be used where in contact with masonry or earth by default as it only prohibited the use of bare aluminum or copper-clad aluminum conductors where subject to corrosive conditions or in direct contact with masonry or earth. Putting the requirements into a list format has changed the requirements. The previous edition limited terminations of aluminum within 18" of the earth. This revision should have clarified that aluminum conductors may be terminated within 18" of earth only when that termination is inside a listed enclosure or when terminated with a listed - sealed fitting in accordance with the installation instructions.

Sasso, Nick

Agree with the other panel members who voted negative. Also, the "termination shall be listed as a sealed wire-connector system" is ambiguous and not clear in meaning. Is this "termination" something that is built into the enclosure? How can a "termination" be listed..? Poorly worded.

Steinman, Gregory J.

“Covered” should not be included in 250.120 (B)(1), since the encasing material protects the conductor when in contact with the earth or masonry. This requirement was added without adequate substantiation, and is in direct conflict with decades of field experience. For example, utility style underground conductors are considered “covered” by the NEC, and yet we know they can operate for decades without issue when direct buried. In item 3, does “unless insulated” mean that the conductor has to be insulated, or the connection? This should be rejected and returned to the first revision language

Affirmative All

Helfrich, William J.

Mohla, Daleep C.

Affirmative with Comment

Simmons, Phil

The action by CMP-5 to include "covered" conductors does not introduce a new concept nor is it improper. The definition of "Covered Conductors" has been in Article 100 for decades. it reads, "A conductor encased within material of composition or thickness that is not recognized by this Code as electrical insulation." Covering can consist of most anything including paper and provides no assurance that it provides any protection for a conductor that is in contact with the earth or masonry. So, covered conductors should be treated as bare. Bare conductors have been included in this section for many years. As covered and discussed at length by the Panel, Sealed Wire Connector Systems are covered in UL ZMWQ. These systems are intended for only insulated conductors. The UL Guide information includes the following, "Sealed wire-connector systems are intended for use with Types USE, RHW, XHHW, RW90 EP, RW90 XLPE or TWU, 30 AWG through 2000 kcmil copper or aluminum conductors with currents not exceeding the ampacity of insulated conductors rated either 75 or 90°C and intended for use at 600 V or less." If the ballot on this revision fails, this text cannot go back to that accepted at the First Revision meeting as it allows bare conductors in Sealed Wire Connection Systems. No documentation was provided for the reference in the voting statements to covered conductors being operated satisfactorily by electric utilities. Really?! Electric

utilities are not about to directly bury power conductors that do not have a proven and reliable insulation system.

Committee Comment No. 601-NFPA 70-2015 [Section No. 300.4 [Excluding any Sub-Sections]]

This was a Second Revision that failed ballot.

Where subject to physical damage, conductors, raceways, and cables shall be protected.

Informational note: Minor damage to a raceway, cable armor or cable insulation does not necessarily violate the integrity of either the contained conductors or the conductors' insulation.

Submitter Information Verification

Submitter Full Name: CMP 3
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Nov 02 11:49:07 EST 2015

Committee Statement

Committee Statement: The informational note provides guidance to an electrical inspector that minor (superficial) damage to the jacket of a cable is not an issue. The first sentence of the proposed informational note is unnecessary since it states the obvious that physical damage doesn't just occur from normal building operation.

Response Message:

Public Comment No. 1028-NFPA 70-2015 [Section No. 300.4 [Excluding any Sub-Sections]]

Ballot Results

This item has failed ballot

15 Eligible Voters
0 Not Returned
6 Negative with Comments
9 Affirmative All
0 Affirmative with Comments
0 Abstention

Negative with Comment

Brewer, Larry G.

Any damaged cable needs to be changed

Casparro, Paul J.

This informational Note does not provide useful guidance and is "making an interpretation" which is in violation of the NEC Style Manual, Section 3.1.3. It is not possible to visually determine the integrity of the conductors when

the metallic or nonmetallic jacket is damaged. "Minor" damage is not defined and the AHJ already has permission to make a determination per NEC 90.4

Corbin, Adam D.

This Informational Note does not provide useful guidance and is "making an interpretation" which is in violation of the NEC Style Manual, Section3.1.3. It is not possible to visually determine the integrity of the conductors when the metallic or nonmetallic jacket is damaged. "Minor damage is not defined and the AHJ already has permission to make a determination per NEC 90.4. This situation must be determined on a case-by-case situation. "Minor damage" is not defined and is open to wide interpretation.

Keden, Ray R.

This Informational Note does not provide useful guidance and is "making an interpretation" which is in violation of the NEC Style Manual, Section3.1.3. It is not possible to visually determine the integrity of the conductors when the metallic or nonmetallic jacket is damaged. "Minor damage is not defined and the AHJ already has permission to make a determination per NEC 90.4. This situation must be determined on a case-by-case situation. "Minor damage" is not defined and is open to wide interpretation

Pace, David A.

The term "minor damage" is not a defined term and is open to broad interpretation. The AHJ already has the authority to made a determination whether or not external damage may affect the conductors within. This is not necessary and will cause confusion.

Straniero, George A.

This Informational Note does not provide useful guidance. It is difficult to visually determine the integrity of the conductors when the metallic or nonmetallic jacket is damaged.

Affirmative All

Bassett, Douglas P.

Brunner, William A.

Burlison, Steven D.

Clary, Shane M.

Mills, T. David

Owen, Steven J.

Scearce, Susan Newman

Sleights, John E.

Stene, Susan L.

Committee Comment No. 3006-NFPA 70-2015 [Section No. 430.22(G)]

This was a Second Revision that failed ballot.

See attached word document [430.22 (G) _3006_CD]

(G) Conductors for Small Motors.

Conductors for small motors shall not be smaller than 14 AWG unless otherwise permitted in 430.22(G)(1) or (G)(2).

(1) 18 AWG Copper.

Where installed in a cabinet or enclosure, 18 AWG individual copper conductors, copper conductors that are part of a jacketed multiconductor cable assembly, or copper conductors in a flexible cord shall be permitted, under either of the following sets of conditions:

(1) The circuit supplies a motor with a full-load current rating, as determined by 430.6(A)(1), of greater than 3.5 amperes, and less than or equal to 5 amperes, and all the following conditions are met:

(2) _ The circuit is protected in accordance with 430.52 .

(3) _ The circuit is provided with maximum Class 10 or Class 10A overload protection in accordance with 430.32 .

(4) _ Overcurrent protection is provided in accordance with 240.4(D)(1)(2) .

(5) The circuit supplies a motor with a full-load current rating, as determined by 430.6(A)(1), of 3.5 amperes or less, and all the following conditions are met:

(6) _ The circuit is protected in accordance with 430.52 .

(7) _ The circuit is provided with maximum Class 20 overload protection in accordance with 430.32 2.

(8) _ Overcurrent protection is provided in accordance with 240.4(D)(1)(2) .

(2) 16 AWG Copper.

Where installed in a cabinet or enclosure, 16 AWG individual copper conductors, copper conductors that are part of a jacketed multiconductor cable assembly, or copper conductors in a flexible cord shall be permitted under either of the following sets of conditions:

(1) The circuit supplies a motor with a full-load current rating, as determined by 430.6(A)(1), of greater than 5.5 amperes, and less than or equal to 8 amperes, and all the following conditions are met:

(2) _ The circuit is protected in accordance with 430.52 .

(3) _ The circuit is provided with maximum Class 10 or Class 10A overload protection in accordance with 430.32 .

(4) _ Overcurrent protection is provided in accordance with 240.4(D)(2)(2) .

(5) The circuit supplies a motor with a full-load current rating, as determined by 430.6(A)(1), of 5.5 amperes or less, and all the following conditions are met:

(6) _ The circuit is protected in accordance with 430.52 .

(7) _ The circuit is provided with maximum Class 20 overload protection in accordance with 430.32 .

(8) _ Overcurrent protection is provided in accordance with 240.4(D)(2)(2) .

Supplemental Information

File Name	Description
430.22_G_3006_CD.docx	Revision to section 430.22(G).

Submitter Information Verification

Submitter Full Name: CMP 11
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Nov 05 15:00:34 EST 2015

Committee Statement

Committee Statement: Installation concerns regarding potential damage to multiconductor cables and cords leaving the enclosure are adequately addressed in the construction specifications, wiring methods, and restrictions in Chapters 3 and 4. See attached word document 430.22(G)_3006_CD.

Response Message:

Public Comment No. 834-NFPA 70-2015 [Section No. 430.22(G)]

Ballot Results

This item has failed ballot

15 Eligible Voters
0 Not Returned
7 Negative with Comments
8 Affirmative All
0 Affirmative with Comments
0 Abstention

Negative with Comment

Folz, Stanley J.

By making this change the phrase 'Where installed in a cabinet or enclosure' is deleted. This will extend the use of #16 AWG and #18 AWG branch circuit wiring to motors. The length of these conductor was not restricted in any way which could lead to their installation in raceways of unlimited length. No substantiation was given in regard to this type of application.

Guidry, Paul E.

I don't see a safety issue with allowing #16 and #18 AWG conductors to be installed outside of an enclosure since they'll have to be installed with a Chapter 3 wiring method and an overcurrent protection device to protect the conductors. However, as a matter of principle, I don't believe the CMP should be changing the Code without a valid Public Input or substantiation.

Ockuly, George J.

Public Comment 834 did not request that individual 16 and 18 AWG conductors be permitted outside the cabinet. Utilization of these smaller conductors outside the cabinet needs to be further analyzed. While the short-circuit and overload protection of 16 and 18 AWG conductors is adequately covered, the mechanical protection for these small individual conductors was not addressed. Further investigation and technical substantiation will be required if individual 16 and 18 AWG conductors are to be permitted for use as general branch circuit wiring to verify mechanical integrity.

Smith, III, Arthur J.

The IEEE agrees that the Panel inadvertently went beyond what was requested by NEMA in PC 834. Doing so opens the possibility for 16 and 18 AWG conductors to be pulled through unlimited lengths of conduit, creating situations where the tensile strength of the conductors may be exceeded.

Thompson, John M.

Where installed in a cabinet or enclosure, should not have been deleted.

Wall, Carl Timothy

The panel went beyond the request of the submitter of PC834 without justification. The submitter of PC834 did not request deletion of the requirement that 18 and 16 AWG single conductors be limited to those in a cabinet or enclosure. The deletion of “Where installed in a cabinet or enclosure,” will allow the use of 18 AWG and 16 AWG for branch circuit wiring to motors; this would conflict with the requirements in 310.106 limiting branch circuit wiring to 14 AWG and larger. The Panel (Committee) statement did not address the logic for deletion of this requirement for the conductors to be within a cabinet or enclosure.

Wright, James R.

This should be reversed. The deletion of “Where installed in a cabinet or enclosure,” will allow the use of 18 AWG and 16 AWG for branch circuit wiring to motors, and no substantiation was submitted to relax the requirements in 310.106 limiting branch circuit wiring to 14 AWG and larger. NEMA PC 834 did not request deletion of the requirement that 18 and 16 AWG single conductors be limited to use in a cabinet or enclosure. The proposal submitted mirrored the requirements found in NFPA 79, which limits the use of single conductor 18 and 16 AWG for use only in cabinets or enclosures.

Affirmative All

Bas, Luis M.

Cole, Terry D.

Cosic, Zivorad

Fahey, Robert G.

Fahey, James M.

Neubauer, Arthur S.

Powell, Charles L.

Widup, Ron

Committee Comment No. 4509-NFPA 70-2015 [Section No. 770.24]

This was a Second Revision that failed ballot.

770.24 Mechanical Execution of Work.

Optical fiber cables shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be secured by hardware, including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform ~~to~~ with 300.4~~(D)~~ - and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 800.170(C).

Informational Note No. 1:~~- Accepted industry practices~~ Industry practices for installing and testing are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/NECA/FOA 301-2015, *Standard for Installing and Testing Fiber Optic Cables*; and other ANSI-approved installation standards.

Informational Note No. 2: See 4.3.11.2.6.5 and 4.3.11.5.5.6 of NFPA 90A-2015, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components installed in accordance with 300.22(C).

Informational Note No. 3: - ~~For additional information regarding overhead wires and cables, see ANSI C2-2012, *National Electric Safety Code, Part 2, Safety Rules for Overhead Lines*~~ Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants can result in an undetermined alteration of optical fiber cable properties .

Submitter Information Verification

Submitter Full Name: CMP 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Nov 02 17:11:43 EST 2015

Committee Statement

Committee Statement: Article 770 deals with all types of optical fiber cable installations and not just installations dealing with communications systems, then the installation requirements for optical fiber cables should comply with all of Section 300.4. Optical fiber cables is used for life safety applications such as for fire alarm systems, some building system controls and industrial process controls.

Informational Note No. 1 was revised to eliminate the word "accepted" because it is generally thought of being associated with the authority having jurisdiction.

New Informational Note No. 3 identifies possible contamination of optical fiber cables during the construction process by paint or other foreign materials, potentially altering the fire resistance, smoke generating or other properties that are part of the cable listing requirements.

Response Message:

Public Comment No. 73-NFPA 70-2015 [Section No. 770.24]

Public Comment No. 173-NFPA 70-2015 [Section No. 770.24]

Public Comment No. 187-NFPA 70-2015 [Section No. 770.24]

Public Comment No. 270-NFPA 70-2015 [Section No. 770.24]

Public Comment No. 1869-NFPA 70-2015 [Section No. 770.24]

Ballot Results

✖ This item has failed ballot

17 Eligible Voters
0 Not Returned
6 Negative with Comments
10 Affirmative All
1 Affirmative with Comments
0 Abstention

Negative with Comment

Brunssen, James E.

The requirements of 300.4 are appropriate for power wiring, not optical fiber cables. Neither a fire nor electrical safety hazard has been cited or identified to justify expanding the requirements of 700.24 to include all of 300.4. Optical fiber cables carry no power and pose neither a fire nor electrical safety hazard. Maintaining reference to only Section 300.4(D) is consistent and correlates with Sections 725.24 and 760.24 that cover the application of optical fiber cables to low voltage signaling and fire alarm systems, respectively. Code-making Panel 3 did not see the necessity to increase requirements in their respective sections; to do so in Article 770 will create correlation issues. The revisions to Informational Notes 1 and 2 are correct and should be retained.

Dawson, Fred C.

I agree with Jim Brunssen's reason for voting negative on this SR.

Dorna, Gerald Lee

SR 4509 requires optical fiber cables to comply with all of 300.4 instead of 300.4(D). The Panel Statement for this change is: “Article 770 deals with all types of optical fiber cable installations and not just installations dealing with communications systems, then the installation requirements for optical fiber cables should comply with all of Section 300.4. Optical fiber cables is used for life safety applications such as for fire alarm systems, some building system controls and industrial process controls.” Requiring installations of optical fiber cables to comply with all of 300.4 rather than just 300.4(D) does not correlate with the installation requirements for Class 1, Class 2 and Class 3 cables in 725.24, nor does it correlate with the installation requirements for power-limited and non-power-limited fire alarm cables in 760.24. No technical substantiation has been presented to support the additional requirements. The panel statement that optical fiber cables are used for “…applications such as fire alarm systems, some building system controls and industrial process controls” does not substantiate why optical fiber cables used in such applications need to comply with all of 300.4. Maintaining reference to only Section 300.4(D) correlates with Article 760 that only requires fire alarm cable installations to comply with 300.4(D). The panel action to require the installation of optical fiber cables to comply with all of 300.4 requires a higher level of physical protection for optical fiber cables than Class 1 and non-power-limited fire alarm cables. It makes no sense to require a higher level of protection for no-voltage (optical fiber) cables than non-power-limited cables. Second Revision 4509 also fixed Informational Note No. 3 which somehow (TerraView error?; Cut and paste error?) had the Informational Note No. 3 from 770.26 in place of the correct informational note about painting cables. If SR 4509 fails ballot, I trust that the Correlating Committee can fix the mix-up of informational notes.

Ivans, Randolph J.

We agree with the ballot comments provided by Gerald Lee Dorna and James E. Brunssen. In addition, it would also bring 770.24 back into alignment with 800.24 covering communications circuits and 820.24 covering CATV circuits. These paragraphs already state that the cables shall be installed so they will not be damaged by normal building use. 300.4 is intended for power cables and the requirements are not necessarily applicable to optical

fiber cables where there are no electrical or source of fire risks. If additional mechanical protection requirements are needed they should be developed specifically for optical fiber and low voltage/low power cables and their intended installations and use.

Johnson, Steven C.

Article 300.4 addresses mechanical installation requirements for power carrying cables. Optical fiber cables do not carry power and do not pose the risks to users or installation personnel that power carrying cables do. Applying all of Article 300.4 to optical fibers would not add safety.

Prezioso, Luigi G.

It is true that fiber optic cable can also part of a life safety system or other critical system, but that does not constitute a safety hazard per the purpose of the Code. Section 300.4 is titled "Protection Against Physical Damage" and it lists environments where physical damage to current carrying conductors could cause a safety hazard. Article 90.1(A) states that "The purpose of this Code is the practical safeguarding of persons and property from hazards arising from the use of electricity." . These are fiber optic cables and are not current carrying. There is no safeguarding from the use of electricity achieved by requiring all of the protections listed under Section 300.4."

Affirmative All

Bish, George

Jensen, Robert W.

Lawrence, Eric

McCoy, William J.

McNamara, Jack

Murphy, Michael F.

Ohde, Harold C.

Parrish, Thomas J.

Pirkle, W. Douglas

Zieman, Leo

Affirmative with Comment

Moore, Thomas E.

This Second Revision should continue to be accepted. Optical Fiber Cables are not limited to the communications industry, they are used for many life safety applications such as fire alarm, building system controls and industrial process controls where the nonorderly shutdown could introduce additional or increased hazards. Section 300.4 applies to many wiring methods and applications including physical protection of cable and raceway wiring methods there is no reason why the same protection should not be applicable to life safety systems.