12-4a Log #CP1201 NEC-P12 (610.2) **Final Action: Accept**

Submitter: Code-Making Panel 12

Recommendation:

Renumber the entire section 610.2 to be new 610.3, and renumber the remainder of the article accordingly.

Substantiation:

This change was made to comply with the 2001 NEC Style Manual Section 2.2.2.2 reserving 610.2 for definitions.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-5 Log #113 NEC-P12 (610-11(A)) **Final Action: Accept**

Submitter: James M. Daly, General Cable

Recommendation:

Change "... are not required..." to "...shall not be required...".

Substantiation:

To comply with 3.1.1 of the NEC Style Manual.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

Explanation of Negative:

12-6 Log #114 NEC-P12 (610-11(B)) **Final Action: Accept**

Submitter: James M. Daly, General Cable

Recommendation:

Change "... are not required..." to "...shall not be required...".

Substantiation:

To comply with 3.1.1 of the NEC Style Manual.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-7 Log #115 NEC-P12 (610-11(B)) **Final Action: Accept**

Submitter: James M. Daly, General Cable

Recommendation:

Revise as follows:

"(B) ~~Open~~ Exposed Conductors. Short lengths of ~~open~~ exposed conductors at...".

Substantiation:

This is one of a series of proposals to provide consistency throughout the code in the use of the terms "exposed", "open wiring", and "open runs" as applied to wiring methods.

"Exposed" is used 306 times throughout the code, "open runs" is used 7 times, and "open wiring" is used 29 times but only 10 of those instances do not refer to "open wiring on insulators".

Exposed is defined in Article 100 as shown below.

"Exposed (as applied to live parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts that are not suitably guarded, isolated or insulated."

"Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access."

Open wiring on insulators is defined in 398.2 as "An exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings."

"Open runs" is not defined in the code.

This series of proposals will limit the term "open wiring" to open wiring on insulators (Article 398) and have the term "exposed" apply to "open runs" and open wiring not on insulators.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

JANIKOWSKI: The terms "open conductors" and "open wiring" have been around a long time. It is very well accepted and understood. I don't think there is enough substantiation of a problem understanding these terms. I also think that a global change to the code would then be in order and Panel 1 may want to consider this change and add a new definition if they feel the need.

12-8 Log #116 NEC-P12 **Final Action: Reject**
(610-11(E)(2))

Submitter: James M. Daly, General Cable

Recommendation:

Change "... cord is approved..." to "... cord shall be approved..."

Substantiation:

To comply with 3.1.1 of the NEC Style Manual.

Panel Meeting Action: Reject

Panel Statement:

The beginning sentence of 610.11(E) creates the mandatory condition. The sentence in 610.11(E)(2) is a condition statement.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-9 Log #117 NEC-P12 **Final Action: Accept**
(610-12(A))

Submitter: James M. Daly, General Cable

Recommendation:

At the end of the first sentence, change "open wiring" to "exposed wiring".

Substantiation:

This is one of a series of proposals to provide consistency throughout the code in the use of the terms "exposed", "open wiring", and "open runs" as applied to wiring methods.

"Exposed" is used 306 times throughout the code, "open runs" is used 7 times, and "open wiring" is used 29 times but only 10 of those instances do not refer to "open wiring on insulators".

Exposed is defined in Article 100 as shown below.

"Exposed (as applied to live parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts that are not suitably guarded, isolated or insulated."

"Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access."

Open wiring on insulators is defined in 398.2 as "An exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings."

"Open runs" is not defined in the code.

This series of proposals will limit the term "open wiring" to open wiring on insulators (Article 398) and have the term "exposed" apply to "open runs" and open wiring not on insulators.

Wire and cable that must be continuously supported and protected will be specifically addressed in the applicable section.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

JANIKOWSKI: See my Explanation of Negative on Proposal 12-7 (Log #115).

12-10 Log #2908 NEC-P12 **Final Action: Accept in Principle**
(610-12(A))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Replace the text "a raceway or cable to open wiring" with the revision indicated below:
(A) Separately Bushed Hole. A box or terminal fitting that has a separately bushed hole for each conductor shall be used wherever a change is made from being contained within a raceway system or cable assembly to not being contained within a raceway system or cable assembly. ~~a raceway or cable to open wiring.~~ A fitting used for this purpose shall not contain taps or splices and shall not be used at luminaire (fixture) outlets.

Substantiation:

The phrase "open wiring" appears more than 30 times in the current 2002 NEC, but it exists in two distinct formats: a) as the defined term "open wiring on insulators" by Article 398.2, or b) simply as the undefined term "open wiring'. With the defined term, open wiring makes reasonable sense. However when used as the undefined term "open wiring", especially when used to describe a cable that is required to have mechanical integrity and protection takes on an entirely different meaning. Clearly such an installation is not "open". Due to the significant difference in the use of the terms, this and associated other proposals if accepted would replace the undefined use of the term "open wiring" with more appropriate language that addresses the installation in 501.4(B)(1)(5), 501.5 Exception No. 2; 503.3(B); 504.30(A)(1); 505.15(C)(1)(c); 505.16(C)(1) Exception No. 2; 610.12(A); 725.61(D)(4); and 727.4(4)(5)(6), and use the full 398.2 defined term where the text suggests as in 300.16(A); 312.5(B); 314.17(B); 314.17(C). Again, individual proposals have been submitted to address each section mentioned.

Panel Meeting Action: Accept in Principle

In the present wording of the existing code, change the words "open wiring" to "exposed wiring".

Panel Statement:

See panel action on Proposal 12-9. Changing "open wiring" to "exposed wiring" accomplishes the purpose with abbreviated clarity. The panel feels that the action taken on Proposal 12-9 satisifies the concerns of the submitter of this proposal.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-11 Log #659 NEC-P12 **Final Action: Reject**
(Table 610-14(A))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise third sentence in heading as follows:
Up to Four Current-Carrying Conductors in Raceway or Cable.

Substantiation:

Present wording indicates neutral conductors are to be counted, where used. Tables 310.16 and 310.18 indicate current-carrying conductors, which permit a neutral not to be counted.

Panel Meeting Action: Reject

Panel Statement:

The submitter's substantiation did not provide any indication that there is a problem with the present text.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

TROUT: The panel action should have been "Accept in Principle." Change the recommendation to read: "Revise third sentence in heading as follows:
Up to Four Simultaneously Energized Power Conductors in a Raceway or Cable".
The Panel statement should read: The ampacities are based on simultaneously energized conductors as indicated by Notes 1 and 2, which limit the ampacities for simultaneously energized conductors in a raceway or cable.
This change will meet the concerns of the submitter.

12-12 Log #655 NEC-P12 **Final Action: Reject**
(610-14(D))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Change the word "required" to "specified".

Substantiation:

Editorial.

Panel Meeting Action: Reject

Panel Statement:

The panel's intent is that this is a requirement. The submitter has not provided any substantiation for this change, and the panel does not agree that the suggested change is editorial.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

TROUT: The panel action on this proposal should have been "Accept in Principle." Change the recommendation to read: Delete the text in 610.14(D) Contact Conductors and replace with:

(D) Contact Conductors. Contact conductors shall have an ampacity as permitted in Table 610.14(A) for 75°C (167°F) conductors. Supports for contact conductors shall be as required by Table 610.14(D).

The Panel Statement should read: Although the panel does not agree with the submitter's substantiation that the recommended change is editorial, the panel agrees that the word "required" is not appropriate as shown in 610.14(D). In addition, an editorial change would be necessary to delete the period after the words "Table 610.14(A)" in the text. Table 610.14(A) does not require conductor ampacities but rather specifies maximum permitted ampacities for conductors under specified conditions. The text in 610.14(D) has a requirement where it says "and in no case shall they be smaller than as shown in Table 610.14(D). This table does not specify wire sizes bur rather has a requirement for "Contact Conductor Supports" based on wire sizes.

The new text reaffirms the requirement that contact conductors are permitted to use only the 75°C (167°F) columns of Table 610.14(A) and that supports for the contact conductors will be supplied in accordance with Table 610.14(D).

This change will meet the concerns of the submitter.

12-13 Log #1330 NEC-P12 **Final Action: Accept**
(610-14(E)(3), and 610.31)

Submitter: National Electrical Code Technical Correlating Committee

Recommendation:

1. Replace the term "compute" with the term "calculate" in the following locations:
610.14(E)(3)
2. Replace the term "computed" with the term "calculated" in the following sections:
610.31.

Substantiation:

This proposal is the result of an effort by the NEC Usability Task Group to standardize the language throughout the NEC relative to the use of the terms computed and calculated. After analyzing the usage, the group agreed that the term "calculated" was the best term for use throughout the NEC. This is one in a series of proposals to standardize on the term calculated.

The term "calculate" and its derivatives is presently used in the article title, section titles, and throughout portions of the existing article. Other Articles of the NEC such as for calculating conductor ampacties (under engineering supervision), calculating the size of enclosures, and in Annex D use the term calculate. Additionally, the term "calculate" is more commonly used in other NFPA codes and standards e.g. NFPA 70E, arc flash calculation. Adversely, the term "computation" has a connotation of using a computer, although "load calculations" are frequently determined using a calculator. It appears that the term "computation" was used more frequently beginning with the 1975 NEC based on an editorial revision project.

Panel Meeting Action: Accept

Panel Statement:

The panel accepts the recommendations of the Technical Correlating Committee.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-14 Log #656 NEC-P12 **Final Action: Reject**
(610-42(A))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Add new text to read as follows:
Branch circuits for additional loads such as heating, lighting, and air conditioning shall be protected in accordance with applicable provisions elsewhere in this Code. Conductor overload protection shall not be required where the interruption of the circuit could create a hazard, such as in a material handling magnet circuit; short-circuit protection shall be provided.

Substantiation:

Edit. The proposed addition, though covered elsewhere, would be helpful to Code users, as is 610.14(F).

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided any technical reason to revise the wording. The wording suggested in the proposal is part of the general rules that may be found in 240.4(A).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

12-15 Log #1340 NEC-P12Meeting Action: Accept in Principle in Part (610-61) **Final Action: Reject**

TCC Action: Reject

The Technical Correlating Committee directs that this proposal be reported as "Reject" to correlate with the Technical Correlating Committee action on Proposal 12-1.

Submitter: Tom Young, DeSuazo Crane Company

Recommendation:

Revise text to read as follows:

610-61 Grounding. All exposed noncurrent-carrying metal parts of cranes, monorail hoists, hoists, and accessories, including pendant controls, shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with Article 250. Moving parts, other than removable accessories or attachments that have metal-to-metal bearing surfaces shall not be considered to be electrically connected to each other through bearing surfaces for grounding purposes. The trolley frame and bridge frame shall not be considered as electrically grounded through the bridge and trolley wheels and its respective tracks. ~~unless local conditions, such as paint or other insulating material, prevent reliable metal-to-metal contact. In this case, a separate bonding conductor shall be provided.~~ A separate grounding conductor shall be provided.

Substantiation:

Justification.

1. Minimizes electrical shock hazards and stray voltages.
2. Eliminates the influence of ambient conditions, such as paint, dirt and unreliable mechanical continuity of wheels, bearings and rail systems.
3. Eliminates potential ground loops.

Panel Meeting Action: Accept in Principle in Part

1. In the second sentence of the recommendation, the addition of the word "not" is not accepted by the panel.
2. Revise the last sentence of the proposed text to read as follows:

"A separate equipment bonding conductor shall be provided."

Panel Statement:

1. There is no substantiation that bearings are not effectively grounded.
2. The language was revised to correlate with the action taken on Proposal 12-1.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 10 Negative: 3

Explanation of Negative:

JONES: This proposal should have been rejected because the submitter did not provide any substantiation to document a problem with the current Code language. Section 610.61 presently requires the entire crane to be grounded in accordance with Article 250. This section also states that if local conditions prevent reliable metal-to-metal contact, a separate bonding conductor shall be provided. Panel 12 has tried to fix a problem that may not exist.

REUSS: I disagree with the Panel's action to Accept in Principle in Part this proposal. The following reasons should be noted:

1. The submitter offers no substantiation. The submitter needs to provide documentation as to the number of times that following the Code as written has not provided the necessary protection from shock hazards.
2. The Code, as written, has provisions for bonding with a separate conductor if needed. The Code does not seem to be in need of a fix. There are numerous hazards that result if the grounding provisions outlined in this and other articles are not followed.
3. There are hundreds of thousands of cranes and hoists that are grounded through the wheels and no problems have been reported.
4. There are other parts of the crane where items are considered grounded because of a wheel running on a rail, festoon conductor trolleys as and example. The Panel needs to make it clear if only the bridge frame and trolley frame are no longer to be considered grounded by the wheel to rail contact or if all wheel to rail contacts are now no longer considered as grounds. If the panel does not clarify their intent, there will be random interpretations of their intended meaning. The Code does not define a "trolley frame". Is it the panel intent to have a bonding conductor attached to every part of the crane that runs on a wheel or similar device?

Because of the above, I feel the panel should Reject this proposal.

WHITE: The presenter has not provided sufficient documentation that a problem exists with the existing wording. The existing wording allows the installer to provide a bonding jumper if required with conditions prevent the reliable metal-to-metal contact. To require a bonding jumper would necessitate a fourth rail or wire in many circumstances and this is unnecessary.

Comment on Affirmative:

BURKE: See my Comment on Affirmative on Proposal 12-1.

12-15a Log #CP1207 NEC-P12 (620.1, FPN No. 1) **Final Action: Accept**

Submitter: Code-Making Panel 12

Recommendation:

In FPN No. 1 change the reference from "A17.1-1996" to "A17.1-2000."

Substantiation:

To provide the correct references.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-16 Log #340 NEC-P12 **Final Action: Accept in Principle**
(620-2–Control Room, Elevator, Dumbwaiter, Material Lift)

TCC Action:

The Technical Correlating Committee understands that the Panel's intent was to only modify the term being defined and to accept the remainder of the proposal. The Technical Correlating Committee directs the panel to rewrite the definition to eliminate the contained requirement not permitted by 2.2.2 of the NEC Style Manual. This action will be considered by the panel as a public comment.

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Add the following new definition:
Control Room, Elevator, Dumbwaiter, Material Lift. An enclosed control space outside the hoistway, intended for full bodily entry, which contains the elevator motor controller. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator, dumbwaiter or material lift but not the electric driving machine or the hydraulic machine.

Substantiation:

Modifications were made to various paragraphs of Article 620 of the 2002 Edition using the term "Control Room". This definition clarifies the term and coordinates its usage with the proposed revisions to A17.1, the Safety Code for Elevators and Escalators.

Panel Meeting Action: Accept in Principle

Revise the term of the proposed definition to read as follows:
"Control Room (for Elevator, Dumbwaiter, and Material Lift)."

Panel Statement:

The revision clarifies the term being defined and meets the definition style of the NEC.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

QUAVE: The recommendation and Panel Action both contain a requirement and includes the term "Material Lift" which is not mentioned or used in this Article. "Material lift" would be new material and should be submitted as such.

12-17 Log #339 NEC-P12 **Final Action: Accept in Principle**
(620-2–Control Space, Elevator, Dumbwaiter, Material Lift)

TCC Action:

The Technical Correlating Committee understands that the Panel's intent was to only modify the term being defined and to accept the remainder of the proposal. The Technical Correlating Committee directs the panel to rewrite the definition to eliminate the contained requirement not permitted by 2.2.2 of the NEC Style.Manual.
This action will be considered by the panel as a public comment.

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Add the following new definition:
Control Space, Elevator, Dumbwaiter, Material Lift. A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, which contains the elevator motor controller. This space could also contain electrical and/or mechanical equipment used directly in connection with the elevator, dumbwaiter or material lift but not the electric driving machine or the hydraulic machine.

Substantiation:

Modifications were made to various paragraphs of Article 620 of the 2002 Edition using the term "Control Space". This definition clarifies the term and coordinates its usage with the proposed revisions to A17.1, the Safety Code for Elevators and Escalators.

Panel Meeting Action: Accept in Principle

Revise the term of the proposed definition to read as follows:
"Control Space (for Elevator, Dumbwaiter, and Material Lift)."

Panel Statement:

The revision clarifies the term being defined and meets the definition style of the NEC.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

QUAVE: See my Explanation of Negative Vote on Propoal 12-16.

12-18 Log #338 NEC-P12 **Final Action: Accept in Principle**
(620-2–Machine Room, Elevator, Dumbwaiter, Material Lift)

TCC Action:

The Technical Correlating Committee understands that the Panel's intent was to only modify the term being defined and to accept the remainder of the proposal.

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Add the following new definition:
Machine Room, Elevator, Dumbwaiter, Material Lift. An enclosed machinery space outside the hoistway, intended for full bodily entry, which contains the electrical driving machine or the hydraulic machine. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator, dumbwaiter or material lift.

Substantiation:

Modifications were made to various paragraphs of Article 620 of the 2002 Edition using the term "Machine Room". This definition clarifies the term and coordinates its usage with the proposed revisions to A17.1, the Safety Code for Elevators and Escalators.

Panel Meeting Action: Accept in Principle

Revise the term of the proposed definition to read as follows:
"Machine Room (for Elevator, Dumbwaiter, and Material Lift)."

Panel Statement:

The revision clarifies the term being defined and meets the definition style of the NEC.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

QUAVE: See my Explanation of Negative Vote on Propoal 12-16.

12-19 Log #337 NEC-P12 **Final Action: Accept in Principle**
(620-2–Machinery Space, Elevator, Dumbwaiter, Material Lift)

TCC Action:

The Technical Correlating Committee understands that the Panel's intent was to only modify the term being defined and to accept the remainder of the proposal.

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Add the following new definition:
Machinery Space, Elevator, Dumbwaiter, Material Lift. A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, which contains elevator, dumbwaiter or material lift mechanical equipment, and could also contain electrical equipment used directly in connection with the elevator, dumbwaiter or material lift. This space could also contain the electric driving machine or the hydraulic machine.

Substantiation:

Modifications were made to various paragraphs of Article 620 of the 2002 Edition using the term "Machinery Space". This definition clarifies the term and coordinates its usage with the proposed revisions to A17.1, the Safety Code for Elevators and Escalators.

Panel Meeting Action: Accept in Principle

Revise the term of the proposed definition to read as follows:
"Machinery Space (for Elevator, Dumbwaiter, and Material Lift)."

Panel Statement:

The revision clarifies the term being defined and meets the definition style of the NEC.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

QUAVE: See my Explanation of Negative Vote on Propoal 12-16.

12-20 Log #1374 NEC-P12 **Final Action: Reject**
(620-5)

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Modify the second sentence of 620.5 as shown below:
620.5 Working Clearances. Working space shall be provided about controllers, disconnecting means, and other electrical equipment. The minimum working space shall not be less than that specified in 110.26(A).
Where conditions of maintenance and supervision ensure that only qualified persons examine, adjust, service, and maintain the equipment, the clearance and headroom requirements of 110.26(A) and 110.26(E) shall be waived as permitted in 620.5(A) through (D).

Substantiation:

It is not clear as to the applicability of 110.26(E) to this equipment, and in some cases such a requirement for a fixed amount of headroom under all conditions is counterproductive to safety especially when working on elevator car tops and in elevator pits. It may put the equipment to be worked on out of reach of the qualified persons necessitating them to use ladders, etc., thereby unnecessarily increasing the risk of falling, particularly on car tops. The conditions of waiver provide for the required safety.

Panel Meeting Action: Reject

Panel Statement:

The substantiation offers no definitive reasons to eliminate requirements for safety. The applicability of Section110.26(E) is clear. Section 110.26 requires sufficient access to working space about all electrical equipment. Section 110.26(A)(3) requires that the work space shall extend to the height required by 110.26(E).

The headroom requirements of 110.26(E) are headroom requirements for personnel, not minimum requirements for the height of electrical equipment. Electrical equipment will not be raised beyond the reach of the maintenance personnel. This requirement will ensure that the workers will have sufficient safe clearance to work on equipment. Raising the possibility of workers falling off car tops raises the question of the proper use of required safety procedures for fall protection or the use of safety barriers mandated by OSHA.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

JUHASZ: Requirements for safety are not totally eliminated but only waived under the prescribed conditions as permitted in 620.5(A) through (C). The stated reason for the requested change is essentially to not place equipment out of easy reach of qualified personnel thereby unnecessarily increasing the risk of falling with the use of ladders, etc. The limited waiver and reason substantiate the change.

12-21 Log #1375 NEC-P12 **Final Action: Reject**
(620-5)

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Add a third paragraph to 620.5 as shown below:
620.5 Working space shall be provided about controllers, disconnecting means, and other electrical equipment. The minimum working space shall not be less than that specified in 110.26(A).
Where conditions of maintenance and supervision ensure that only qualified persons examine, adjust, service, and maintain the equipment, the clearance requirements of 110.26(A) shall be waived as permitted in 620.5(A) through (D).
The headroom provisions of 110.26(E) apply only to service equipment, switchboards, panelboards, and motor control centers.

Substantiation:

The requirements of 110.26(E) have been applied to equipment other than specified in the rule. This modification to 620.5 is to make it clear that it applies only to the specified equipment and no other. Application of this requirement to elevator electrical equipment in general is counterproductive to safety especially when working on elevator car tops and in elevator pits. It may put the equipment to be worked on out of reach of the qualified persons necessitating them to use ladders, etc., thereby unnecessarily increasing the risk of falling, particularly on car tops.

Panel Meeting Action: Reject

Panel Statement:

See Panel Action and Statement on Proposal 12-20.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-22 Log #1987 NEC-P12Meeting Action: Accept **Final Action: Reject**
(620-21(A)(2)(b))

TCC Action: Reject

The Technical Correlating Committee directs that this proposal be reported as "Reject" to correlate with the Technical Correlating Committee action on Proposal 12-1.

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(b) Hard-service cords and junior hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates. Hard-service cords only shall be permitted as flexible connections for the top-of-car operating device or the car-top work light. Devices or luminaires (fixtures) shall be grounded by means of an equipment ~~grounding~~ bonding conductor run with the circuit conductors. Cables with smaller conductors and other types and thicknesses of insulation and jackets shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates, if listed for this use.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

JANIKOWSKI: Panel 12 accepted this change from "grounding" conductor to "bonding" conductor. I think this is a Panel 5 issue if accepted. We have been training electricians and contractors for years using the terms "grounded" and "grounding". To start this process all over would cause more confusion than we need. NEC instructors and Soares grounding manuals do an excellent job and I don't think there is a problem out in the field.

WINFREY: See my Explanation of Negative Vote on Proposal 12-1.

Comment on Affirmative:

BURKE: See my Comment on Affirmative on Proposal 12-1.

12-23 Log #2418 NEC-P12 **Final Action: Accept in Principle**
(620-22(A))

Submitter: William Davis, Eastman Kodak Co.

Recommendation:

Add text to 620.22(A) which would state that the car lights and car top lighting will not be supplied from the load side of a ground-fault circuit interrupter,as is stated in 620.23(A) and 620.24)A).

Substantiation:

I've inspected numerous elevator installations and modifications and have seen car and car top lighting circuits being installed from the load side of the required GFCI receptacle installed on top of the car.I along with the local elevator inspector will not approve this installation for the obvious reason that if a portable tool being in use on the car top trips the GFCI all lighting in and on the car will be extinguished. Many elevator installers will follow the stated wording in 620.23(A) and 620.24(A) but because it is written as mandatory text. Not so with 620.22(A).

Panel Meeting Action: Accept in Principle

In the current wording of the Code, add a third sentence, as a new paragraph, to 620.22(A) to read as follows:
"Required lighting shall not be connected to the load side of a ground-fault circuit interrupter."

Panel Statement:

Although the proposal does not comply with Section 4-3.3(c) of the Regulations Governing Committee Projects in that no recommended language was provided, the panel has provided additional wording to 620.22(A) to address the concerns of the submitter.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

QUAVE: The Panel Action would not solve the submitter's concerns about car top lighting. The requirement should only apply to Elevator Car Top Lighting. Car Top Lighting is not required in 620.22(A) only car lighting. Car lighting could be connected to the load side of a GFCI if so designed because the elevator code A.17.1 requires such lighting to be provided with an automatic back up supply in the event of a power loss. Placing the car lights on the load side of the GFCI will increase safety without the concern for loss of car lighting.

12-24 Log #2621 NEC-P12 **Final Action: Reject**
(620-23)

Submitter: Richard F. Van Wert, Middle Department Inspection Agency

Recommendation:

Relocate Article 620.23, page 70-493 to 620 VIII on page 70-497 as new Section 620.72.

Substantiation:

Problem: Trying to locate requirements for machine room. After locating "machine room" in table of contents or index under "elevators" the reader goes to Article 620 VIII to check the requirements. It is here that information from 620.23 should be.

Panel Meeting Action: Reject

Panel Statement:

The submitter offers no definitive technical substantiation that an unsafe installation problem exists in the field because of the location of the requirements of 620.23(B). Part III of Article 620 contains the wiring methods required for wiring under this article. Moving the wiring methods for machine rooms to another location would not increase usability.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

JONES: I agree with the submitter. Section 620.23 contains requirements for the machine room such as a light switch and receptacle and these requirements would be better suited in Part VIII. This change would make the NEC more user friendly.

12-25 Log #439 NEC-P12 **Final Action: Reject**
(620-24(B))

Submitter: John Kunkel, Saturn Electric

Recommendation:

Revise text to read as follows:
The lighting switch shall be located so as to be readily accessible from the pit door and shall have a pilot light.

Substantiation:

When you open a pit door you cannot see the switch.

Panel Meeting Action: Reject

Panel Statement:

The location of the switch is already specified in 620.24(B). The addition of a pilot light is a design consideration and would not add to the safety of the installation, but only to the convenience of the user.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-26 Log #3264 NEC-P12 **Final Action: Reject**
(620-37(D))

Submitter: Thomas F. Norton , Norel Service Co. Inc.

Recommendation:

Add a new 620.37(D) to read as follows:
(D) Wiring connected directly to the firefighters service recall circuits of the elevator controller shall not extend beyond 1 m (3 ft) of the elevator controller and shall connect to the listed relay or other appliance as required by 6.15.2.2 of NFPA 72-2002.

Substantiation:

For many years contractors have tied the wiring from the smoke detector relay directly into firefighters service recall circuits of elevator controllers. This method presents a hazard because these circuits are usually 110 vac. This proposal provides clarification of the supervision requirements of NFPA 72 and would bring the NFPA 70 and 72 into correlation.

Panel Meeting Action: Reject

Panel Statement:

Since this issue is already covered in NFPA 72-2002, the National Fire Alarm Code, the panel does not see the necessity of including this material in the NEC.

This is an issue of supervision and training.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-27 Log #652 NEC-P12 **Final Action: Reject**
(620-42(A))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Add new text to read as follows:
Branch circuits for additional loads such as heating, lighting, and air conditioning shall be protected in accordance with applicable provisions elsewhere in this Code.

Substantiation:

Edit. The proposed addition would be helpful to Code users as is 610.14(F).

Panel Meeting Action: Reject

Panel Statement:

Since there is no existing 620.42(A), the panel is uncertain as to the placement of the recommended text. Therefore, the panel cannot act accurately on this proposal.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-28 Log #1376 NEC-P12 **Final Action: Accept**
(620-61(B))

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Revise as follows:
(B) Overload Protection for Motors. Motor and branch-circuit overload protection shall conform to Article 430, Part III and the following:

Substantiation:

The addition is made to clarify that overload protection for motors has to comply with Article 430, Part III.

Panel Meeting Action: Accept

Panel Statement:

The committee understands that the recommended text is to be added following the Heading of 620.61(B).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-29 Log #1377 NEC-P12 **Final Action: Accept**
(620-61(B)(1))

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Revise last sentence of 620.61(B)(1) to read as follows:
Such motors shall be permitted to be protected against overload in accordance with 430.33.

Substantiation:

The addition is made to clarify that the requirements in 430.33 are permissible and not mandatory.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-30 Log #1378 NEC-P12 **Final Action: Accept**
(620-61(B)(4))

Submitter: Andy Juhasz, KONE Inc. / Rep. National Elevator Institute Inc. (NEII)

Recommendation:

Revise last sentence of 620.61(B)(4) to read as follows:
Such motors shall be permitted to be protected against overload in accordance with 430.33.

Substantiation:

The addition is made to clarify that the requirements in 430.33 are permissible and not mandatory.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-31 Log #2551 NEC-P12 **Final Action: Reject**
(620-62)

Submitter: Jim Pauley, Square D Company

Recommendation:

Revise 620.62 as shown below:

620.62 Selective Coordination. Where more than one driving machine disconnecting means is supplied by a single feeder, the overcurrent protective devices in each disconnecting means shall be selectively coordinated with any other supply side overcurrent protective devices. The requirement for selectivity shall apply to all fault modes including ground-faults.

Substantiation:

Since CMP 12 has added the selectively requirement for elevator overcurrent devices there has been confusion about what modes of fault require selective operation. Much focus has been placed on the selectivity of the devices at high-current bolted fault levels. However, that is not the range where most faults occur. Most faults (after initial installation) are lower level faults and typically to ground.

The panel needs to clarify the purpose of the selectivity requirement. If the panel truly desires selectivity for the elevators, then it needs to made clear that this selectivity is required in all fault modes including ground-faults. If it selectivity is not achieved in all modes, the panel should delete the entire requirement.

It should be noted that this proposal does NOT require that ground-fault protection be installed. It only requires that the overcurrent devices be selective in all modes including ground-fault.

Panel Meeting Action: Reject

Panel Statement:

Present code text clearly covers the fault modes required to be selectively coordinated.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-32 Log #2265 NEC-P12 **Final Action: Reject**
(625-2–Definitions)

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
652.2 Definitions.
Electric Vehicle. An automotive-type vehicle for highway use, such as passenger automobiles, buses, trucks, vans, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. For the purpose of this article, electric motorcycles and similar type vehicles and off-road self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.
Electric Vehicle Connector. A device that, by insertion into an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of charging and information exchange. This device is part of the electric vehicle coupler.
Electric Vehicle Coupler. A mating electric vehicle inlet and electric vehicle connector set.
Electric Vehicle Inlet. The device on the electric vehicle into which the electric vehicle connector is inserted for charging and information exchange. This device is part of the electric vehicle coupler. For the purposes of this Code, the electric vehicle inlet is considered to be part of the electric vehicle and not part of the electric vehicle supply equipment.
Electric Vehicle Nonvented Storage Battery. A hermetically sealed battery comprised of one or more rechargeable electrochemical cells that has no provision for release of excessive gas pressure, or for the addition of water or electrolyte, or for external measurements of electrolyte specific gravity.
Electric Vehicle Supply Equipment. The conductors, including the ungrounded, ~~grounded~~ earth, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of delivering energy from the premises wiring to the electric vehicle.
Personnel Protection System. A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided sufficient technical documentation that the present term "grounded" has caused any technical problems. Changing the term "grounded" to "earth" is outside the jurisdiction of Code-Making Panel 12 and should be acted on by Code-Making Panel 5 for Article 250 and Code-Making Panel 1 for Definitions.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-33 Log #2638 NEC-P12 **Final Action: Accept**
(625-2–Electric Vehicle)

Submitter: Frank C. Lambert, Georgia Tech/NEETRAC / Rep. EPRIWC Hybrid Electric Vehicle Working Group

Recommendation:

Revise the definition of Electric Vehicle to include neighborhood electric vehicles as follows:
625.2 Definition.
Electric Vehicle. An automative-type vehicle for highway use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. For the purpose of this article, electric motorcycles and similar type vehicles and off-road self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground-support equipment, tractors, boats, and the like, are not included.

Substantiation:

Federal law includes a new vehicle category, the "Neighborhood Electric Vehicle", to encourage the use of zero-emission vehicles for inner-city use. Smaller than traditional cars, they are still required to have automotive grade headlights, seat belts, windshields, brakes and other safety equipment. With a top speed of 25 mph, the cars can only be used on streets with a posted 35 mph speed limit. See the following legal background:

NHTSA/DOT final rule on Neighborhood Electric Vehicles (NEV)
63 FR 33913, June 17, 1998
DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
49 CFR Part 571
[Docket No. NHTSA 98-3949]
RIN 2127-AG58
Federal Motor Vehicle Safety Standards
AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.
ACTION: Final rule

SUMMARY: This final rule responds to a growing public interest in using golf cars (1) and other similar-sized, 4-wheeled vehicles to make short trips for shopping, social and recreational purposes primarily within retirement or other planned communities with golf courses. These passenger-carrying vehicles, although low-speed, offer a variety of advantages, including comparatively low-cost and energy-efficient mobility. Further, many of these vehicles are electric-powered. The use of these vehicles, instead of larger, gasoline-powered vehicles like passenger cars, provides quieter transportation that does not pollute the air of the communities in which they are operated.

Currently, there is a growing conflict between state and local laws, on the one hand, and Federal law, on the other, in the treatment of these small vehicles. That conflict unnecessarily restricts the ability of vehicle manufacturers to produce and sell, and the ability of consumers to purchase, these vehicles. In recent years, a growing number of states from California to Florida have passed legislation authorizing their local jurisdictions to permit general on-road use of "golf carts," subject to speed and/or operational limitations. A majority of those states condition such broad use upon the vehicles having specified safety equipment. Further, some of these states have opened the way for the use of vehicles that are faster than almost all golf cars. Most conventional golf cars, as originally manufactured, have a top speed of less than 15 miles per hour. These states have either redefined "golf carts" to include vehicles designed to achieve up to 25 miles per hour or have established a new class of vehicles, "neighborhood electric vehicles," also defined as capable of achieving 25 miles per hour.

Under current NHTSA interpretations and regulations, so long as golf cars and other similar vehicles are incapable of exceeding 20 miles per hour, they are subject to only state and local requirements regarding safety equipment. However, if these vehicles are originally manufactured so that they can go faster than 20 miles per hour, they are treated as motor vehicles under Federal law. Similarly, if golf cars are modified after original manufacture so that they can achieve 20 or more miles per hour, they too are treated as motor vehicles. Further, as motor vehicles, they are currently classified as passenger cars and must comply with the Federal motor vehicle safety standards for that vehicle type. This creates a conflict with the state and local laws because compliance with the full range of those standards is not feasible for these small vehicles.

To resolve this conflict, and to permit the manufacture and sale of small, 4-wheeled motor vehicles with top speeds of 20 to 25 miles per hour, this final rule reclassifies these small passenger-carrying vehicles. Instead of being classified as passenger cars they are now being classified as "low-speed vehicles." Since conventional golf cars, as presently manufactured, have a top speed of less than 20 miles per hour, they are not included in that classification.

As low-speed vehicles, these 20 to 25 mile-per-hour vehicles are subject to a new Federal Motor Vehicle Safety Standard No. 500 (49 CFR 571.500) established by this final rule. The agency notes that the growing on-road use of golf cars has already resulted in some deaths and serious injuries, and believes that the new standard is needed to address the effects in crashes of the higher speed of low-speed vehicles. The standard requires low-speed vehicles to be equipped with headlamps, stop lamps, turn signal lamps, tail lamps, reflex reflectors, parking brakes, rearview mirrors, windshields, seat belts, and vehicle identification numbers. The agency believes that these requirements appropriately address the safety of low-speed vehicle occupants and other roadway users, given the sub-25 mph speed capability of these vehicles and the controlled environments in which they operate.

This rulemaking proceeding was initiated in response to a request by Bombardier, Inc., that the agency make regulatory changes to permit the introduction of a new class of 4-wheeled, passenger-carrying vehicle that is small, relatively slow-moving, and low-cost.

DATES: The final rule is effective upon its publication in the Federal Register. Petitions for reconsideration must be filed not later than [45 days after publication of the final rule].

Incorporation by reference of the materials listed in this document is approved by the Director of the Federal Register and is effective upon publication in the Federal Register.

ADDRESSES: Petitions for reconsideration should refer to the Docket number and be submitted to Docket Management, PL-401, 400

7th Street, SW, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT:

For technical issues: Stephen R. Kratzke, Office of Crash Avoidance Standards, NHTSA, Room 5307, 400 7th Street, SW, Washington, DC 20590.

For legal issues: Taylor Vinson, Office of Chief Counsel, NHTSA, Room 5219, 400 7th Street, SW, Washington, DC 20590.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

JONES: This proposal should have been rejected. I don't understand how a vehicle that is limited to 25 MPH would be acceptable for highway use. The idea of neighborhood electric vehicles being used on public streets instead of golf carts is commendable. These vehicles seem to be manufactured with added safety equipment that will offer more protection to the occupants in the case of an accident. However, Article 625 is only concerned with the electric vehicle charging system and the submitter offered no technical substantiation that this type of vehicle has the same charging system requirements as covered in the article.

12-34 Log #2640 NEC-P12 **Final Action: Accept in Principle**
(625-25)

Submitter: Frank C. Lambert, Georgia Tech/NEETRAC / Rep. EPRIWC Hybrid Electric Vehicle Working Group

Recommendation:

Revise Section 625.25 as follows:

625.25 Loss of Primary Source. Means shall be provided such that upon loss of voltage from the utility or other electric system(s), energy cannot be backfed through the electric vehicle supply equipment <u>not specifically identified for the purpose,</u> to the premises wiring system. The electric vehicle shall not be permitted to serve as a standby power supply, <u>unless it is listed and suitable for the purpose</u>.

Substantiation:

New classes of Hybrid Electric Vehicles (HEV) are being developed with the capability to use an on-board generation system as either a standby power source or as a source of power production operating in parallel with a primary source(s) of electricity, in addition to its normal function of charging the vehicle batteries. The use of such vehicle or vehicle related equipment for this purpose should comply with all related installation practices and safety regulations in place for similar types of equipment, as well as the requirements of IEEE p1547.

See the companion proposal for revising 625.26.

Panel Meeting Action: Accept in Principle

Revise the wording of the current code text to read as follows:

"625.25 Loss of Primary Source.

Means shall be provided such that, upon loss of voltage from the utility or other electric system(s), energy cannot be backfed through the electric vehicle and the supply equipment to the premises wiring system, unless permitted by 625.26."

Panel Statement:

The revised wording will clarify the listing requirements.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-35 Log #2639 NEC-P12 **Final Action: Accept in Principle**
(625-26 (New))

TCC Action:

The Technical Correlating Committee directs that the Action on this Proposal be rewritten to comply with 4.1.1 of the NEC Style Manual that references shall not be made to an entire article unless additional conditions are specified. References to parts or sections of an Article are permitted. In addition, the panel is directed to address the use of the term "and/or". This action will be considered by the Panel as a Public Comment.

Submitter: Frank C. Lambert, Georgia Tech/NEETRAC / Rep. EPRIWC Hybrid Electric Vehicle Working Group

Recommendation:

Add a new Section 625.26 as follows:

625.26 Interactive Systems. Electric vehicle supply equipment and other parts of a system, either on-board or off-board the vehicle, identified for and intended to be interconnected to a vehicle and also serve as an optional standby system and/or an electric power production source or provide for bi-directional power feed shall be listed as suitable for the purpose and shall comply with Articles 702, 705, and the other applicable articles of this Code.

FPN: IEEE P1547 Draft Standard for Interconnecting Distributed Resources with Electric Power Systems; (see http://grouper.ieee.org/groups/scc21/1547/) was developed for stationary distributed resources (DR) but it should also apply to mobile DR. The draft standard addresses safety issues including disconnection after fault (unintentional islanding), no energization of the area electric power system when the system is deenergized, and a readily accessible visible-break isolation device.

Substantiation:

New classes of Hybrid Electric Vehicles (HEV) are being developed with the capability to use an on-board generation system as either a standby power source or as a source of power production operating in parallel with a primary source(s) of electricity, in addition to its normal function of charging the vehicle batteries. The use of such vehicle or vehicle related equipment for this purpose should comply with all related installation practices and safety regulations in place for similar types of equipment, as well as the requirements of IEEE p1547.

See the companion proposal for revising 625.25.

Panel Meeting Action: Accept in Principle

Revise the wording in the recommended text to read as follows:

"625.26 Interactive Systems. Electric vehicle supply equipment and other parts of a system, either on-board or off- board the vehicle, identified for and intended to be interconnected to a vehicle and also serve as an optional standby system and/or an electric power production source or provide for bi-directional power feed shall be listed as suitable for that purpose and shall comply with Articles 702 , 705 , and the other applicable articles of this Code."

The Fine Print Note is to be deleted.

Panel Statement:

Revised wording was added to clarify the listing requirements. The Fine Print Note has been deleted as it references document IEEE P1547 which is a draft standard and cannot be referenced.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

BURKE: The wording chosen by the committee to revise the original recommendation requires further editing. Modify the Panel Action wording to:

"625.26 Interactive Systems. Electric Vehicle supply equipment and other parts of the system, either on-board or off-board the vehicle, which are identified for and intended to be interconnected to a vehicle and also serve as an optional standby system and/or an electric power production source, or provide for bi-directional power feed, shall be listed...".

12-36 Log #2318 NEC-P12 **Final Action: Accept in Principle in Part**
(630-1)

TCC Action:

The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Accepts" the Panel Action.

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

Recommendation:

Revise existing text to read:

630.1 Scope. This article covers apparatus for electric arc welding, resistance welding ~~apparatus, and~~, plasma cutting, and other similar welding and cutting processes equipment that ~~is~~ are connected to an electric supply system~~.~~ and are used in unclassified locations as defined in 500.2.

Substantiation:

This proposal is related to the proposal for 630.2 which also concerns plasma cutting apparatus, not listed in the old scope. See the substantiation for the 630.2 proposal regarding apparatus use in unclassified locations.

Panel Meeting Action: Accept in Principle in Part

The panel accepts the proposed wording revised as follows:

630.1 Scope. This article covers apparatus for electric arc welding, resistance welding, plasma cutting, and other similar welding and cutting process equipment that is connected to an electric supply system.

Panel Statement:

The approval of Article Scope Statements is the responsibility of the Technical Correlating Committee. The panel does not agree with the addition of the wording "and are used in unclassified locations as defined in 500.2" because it eliminates the rules for the use of any welding equipment in classified areas. In addition, the panel has modified some of the wording in the proposed text to provide clarity.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-37 Log #2330 NEC-P12 **Final Action: Reject**
(630-3)

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

Recommendation:

Add the following:

630.3 Classification of Location. Equipment constituting a welding or cutting system that, under normal operation, would contain flammable gases or gas mixtures shall be considered to be an unclassified location as defined in 500.2.

Substantiation:

Some arc welding and plasma cutting processes require the use of flammable gases or gas mixtures, such as methane or argon/hydrogen, as shielding or cutting gases. The gas or gas mixture is distributed from a bottle or tank, through a gas console/power source to the torch-lead/torch. Because of the presence of flammable gases or gas mixtures within the components of a welding or cutting system, certain authorities could consider the area in which a system is installed to be a hazardous location and apply the restrictive provisions of NEC Article 500. In practice, these welding/cutting systems can safely be used in what normally would be considered nonhazardous locations, and Article 630 is meant to address such use. Therefore, text is needed in Article 630 to emphasize that:

1) the equipment itself should not be considered hazardous; and
2) the equipment, because it contains gases/gas mixtures, should not be used in hazardous (classified) locations.

The first point is addressed by the proposed addition of a 630.2; the second point is addressed by the new wording for 630.1 (scope).

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided any definitive substantiation that the recommendation relating to classification of location is a necessary addition to the article. The panel wishes to point out that classification of location is covered under the rules of Chapter 5.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-38 Log #2385 NEC-P12 **Final Action: Accept in Principle**
(630-11(B))

Submitter: Noel Williams Herriman, UT

Recommendation:

Change the subsection to read as follows:
"(B) Group of Welders. The ampacity of conductors that supply two or more welders shall be based on the individual currents determined in 630.11(A) and shall not be less than the sum of 100 percent of the two largest welders. . ." (Remainder of the section and the exception to be unchanged.)

Substantiation:

When the FPN under this section was changed to code text for the 2002 code, the new requirement requires that calculations be done in the prescribed manner even if expected loading is higher. The previous FPN was simply an example, but it has been turned into a mandate. The exception permits lower ampacities, but the nature of the text does not permit the use of higher ampacities. While this result is clearly absurd, the language "shall be" is mandatory. The proposed language is borrowed from 630.31(B). The more obvious change might be to make the whole thing permissive with the use of the words "shall be permitted to be," but this would remove the part that should be a requirement: the use of the individual currents from 630.11(A) in determining a minimum rating.

Panel Meeting Action: Accept in Principle

Panel Statement:

See Panel Action and Statement on Proposal 12-39.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-39 Log #3243 NEC-P12 **Final Action: Accept**
(630-11(B))

Submitter: Paul Dobrowsky Holley, NY

Recommendation:

Revise as follows:
(B) Group of Welders. Minimum Conductor ~~Conductor~~ ampacity shall be based on the individual currents determined in 630.11(A) as the sum of 100 percent of the two largest welders, plus 85 percent of the third largest welder, plus 70 percent of the fourth largest welder, plus 60 percent of all remaining welders.
Other parts of this section to remain.

Substantiation:

As presently written, conductors larger than specified can not be used.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-40 Log #363 NEC-P12 **Final Action: Reject**
(630-13)

Submitter: Ken Bush, Chair General/WFCA/NFPA AD-Hoc Committee

Recommendation:

Add a new third paragraph to read:
The disconnecting means shall be marked "Emergency Disconnect" and shall be visible from the equipment.

Substantiation:

Due to the hazards associated with arc welding, the proposed text is intended to create a "user friendly" situation to facilitate prompt and appropriate interventions when the circumstances exist that would require mitigation.
Any disconnecting means which is not an integral part of the arc welding equipment should be clearly marked to clearly identify the means to disconnect the power source from such equipment. The marking and visibility of such disconnect means is important so that special measures can immediately be initiated by the equipment user under emergency conditions, as well as to ensure that power to such equipment has been controlled by the operation of the proper disconnecting means.

Panel Meeting Action: Reject

Panel Statement:

The disconnecting means required in 630.13 is not intended to be an emergency disconnecting means. Its intent is to serve as a disconnecting means required by 422.30 only when the arc welder is not equipped with a disconnecting means mounted the integral part of the welder. The identification of the disconnecting means is clearly indicated in the requirements of 110.22.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-41 Log #3495 NEC-P12Meeting Action: Accept (640-2) **Final Action: Reject**

TCC Action: Reject

The Technical Correlating Committee directs that this proposal be reported as "Reject" to correlate with the Technical Correlating Committee action on Proposal 12-1.

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:

Technical Power System. An electrical distribution system with grounding in accordance with 250.146(D), where the equipment ~~grounding~~ bonding conductor is isolated from the premises grounded conductor except at a single grounded termination point within a branch-circuit panelboard, at the originating (main breaker) branch-circuit panelboard, or at the premises grounding electrode.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

JANIKOWSKI: See my Explanation of Negative on Proposal 12-22 (Log #1987).

WINFREY: See my Explanation of Negative Vote on Proposal 12-1.

Comment on Affirmative:

BURKE: See my Comment on Affirmative on Proposal 12-1.

12-42 Log #2266 NEC-P12 **Final Action: Reject**
(640-2–Definitions)

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:

640.2 Definitions. For purposes of this article, the following definitions apply.

Abandoned Audio Distribution Cable. Installed audio distribution cable that is not terminated at equipment and not identified for future use with a tag.

Audio Amplifier or Pre-Amplifier. Electronic equipment that increases the current or voltage, or both, potential of an audio signal intended for use by another piece of audio equipment. *Amplifier* is the term used to denote an audio amplifier within this article.

Audio Autotransformer. A transformer with a single winding and multiple taps intended for use with an amplifier loudspeaker signal output.

Audio Signal Processing Equipment. Electrically operated equipment that produces or processes, or both, electronic signals that, when appropriately amplified and reproduced by a loudspeaker, produce an acoustic signal within the range of normal human hearing (typically 20-20 kHz). Within this article, the terms *equipment* and *audio equipment* are assumed to be equivalent to audio signal processing equipment.

FPN: This equipment includes, but is not limited to, loudspeakers; headphones; pre-amplifiers; microphones and their power supplies; mixers; MIDI (musical instrument digital interface) equipment or other digital control systems; equalizers, compressors, and other audio signal processing equipment; audio media recording and playback equipment, including turntables, tape decks and disk players (audio and multimedia), synthesizers, tone generators, and electronic organs. Electronic organs and synthesizers may have integral or separate amplification and loudspeakers. With the exception of amplifier outputs, virtually all such equipment is used to process signals (utilizing analog or digital techniques) that have nonhazardous levels of voltage or current potential.

Audio System. Within this article, the totality of all equipment and interconnecting wiring used to fabricate a fully functional audio signal processing, amplification, and reproduction system.

Audio Transformer. A transformer with two or more electrically isolated windings and multiple taps intended for use with an amplifier loudspeaker signal output.

Equipment Rack. A framework for the support, enclosure, or both, of equipment. May be portable or stationary. See ANSI/EIA/310-D-1992, *Cabinets, Racks, Panels and Associated Equipment.*

Loudspeaker. Equipment that converts an ac electric signal into an acoustic signal. The term *speaker* is commonly used to mean *loudspeaker*.

Maximum Output Power. The maximum output power delivered by an amplifier into its rated load as determined under specified test conditions. This may exceed the manufacturer's rated output power for the same amplifier.

Mixer. Equipment used to combine and level match a multiplicity of electronic signals, such as from microphones, electronic instruments, and recorded audio.

Mixer-Amplifier. Equipment that combines the functions of a mixer and amplifier within a single enclosure.

Portable Equipment. Equipment fed with portable cords or cables intended to be moved from one place to another.

Powered Loudspeaker. Equipment that consists of a loudspeaker and amplifier within the same enclosure. Other signal processing may also be included.

Rated Load Impedance. The amplifier manufacturer's stated or marked speaker impedance into which an amplifier will deliver its rated output power. 2& 4&, and 8& are typical ratings.

Rated Output Power. The amplifier manufacturer's stated or marked output power capability into its rated load.

Rated Output Voltage. For audio amplifiers of the constant-voltage type, the nominal output voltage when the amplifier is delivering full rated power. Rated output voltage is used for determining approximate acoustic output in distributed speaker systems that typically employ impedance matching transformers. Typical ratings are 25 volts, 70.7 volts, and 100 volts.

Technical Power System. An electrical distribution system with grounding in accordance with 250.146(D), where the equipment grounding conductor is isolated from the premises ~~grounded~~ earth conductor except at a single ~~grounded~~ earth termination point within a branch-circuit panelboard, at the originating (main breaker) branch-circuit panelboard, or at the premises grounding electrode.

Temporary Equipment. Portable wiring and equipment intended for use with events of a transient or temporary nature where all equipment is presumed to be removed at the conclusion of the event.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.

I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.

The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.

I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

See Panel Action and Statement on Proposal 12-32.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-43 Log #1743 NEC-P12 **Final Action: Reject**
(640-3)

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be referred to Code-Making Panel 3 for information.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:
640.3 Locations and Other Articles.
Circuits and equipment shall comply with 640.3(A) through (L), as applicable.
(A) Spread of Fire or Products of Combustion. The accessible portion of abandoned audio distribution cables shall not be permitted to remain. See 300.21.
(B) Ducts, Plenums, and Other Air-Handling Spaces. See 300.22 for circuits and equipment installed in ducts , plenums, and other air-handling spaces o~~r plenums or other space used for environmental air~~ .
FPN: NFPA 90A-1999, Standard for the Installation of Air Conditioning and Ventilation Systems, 2-3.10.2(a), Exception No. 3, permits loudspeakers, loudspeaker assemblies, and their accessories listed in accordance with UL 2043-1996, Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces, to be installed in ~~other spaces used for environmental air~~ (ceiling cavity plenums) .
(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 12-43 substantiation is shown on page 2344]

Panel Meeting Action: Reject

Panel Statement:

The recommendation introduces a change that the substantiation claims would be consistent with a proposal submitted to Code-Making Panel 3. Panel 12 has no information concerning the proposal to Panel 3. The present wording of 640.3 and the fine print note are consistent with the current requirements of 300.22 and Panel 12 could only agree with the recommendation if Panel 3 accepts the change submitted to them. The panel requests that the Technical Correlating Committee provide the panel with direction on this matter, if necessary.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-44 Log #466 NEC-P12 **Final Action: Accept**
(640-3(A), 645.5 (D) (6))

Submitter: Stanley Kaufman, OFS

Recommendation:

Replace "shall not be permitted to remain" with "shall be removed".

Substantiation:

The requirement for the removal of abandoned cables is currently stated as, "The accessible portion of (cable type) cables shall not be permitted to remain." "Shall not be permitted to remain" is a convoluted way of saying, "shall be removed".
Section 3.3.1.2 of the 2001 NEC Style Manual states, "Use simple declarative sentence structure...".
Keep it simple!

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-45 Log #657 NEC-P12 **Final Action: Reject**
(640-4)

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Delete present wording and substitute:
Amplifiers, loudspeakers, and other equipment shall be so located or protected so as not likely to be subject to physical damage, and shall comply with 110.11.

Substantiation:

"Environmental exposure" is not specific. Unless hermetically sealed, all equipment is exposed to the environment. One cannot predetermine whether physical damage, or environmental exposure might cause shock, fire, or personal hazard, and it is not necessary to list results of damage or exposure.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided any definitive technical substantiation that a problem exists with the present wording of 640.4. The panel believes that the intent of 640.4 is clearly expressed with the present wording and that the proposed wording would be of no value in explaining the intent.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-46 Log #864 NEC-P12 **Final Action: Reject**
(640-5)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 640.5 as follows:
640.5 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to equipment shall not be denied by an excess accumulation of wires and cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 640.5 has been misinterpreted to mean that wires and cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when the concept was introduced into the 1993 NEC. At that time CMP 16 stated in response to a proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of wires and cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited wire and cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of wire and cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 725.5, 760.5, 770.7, 800.5, 820.5, and 830.6.

Panel Meeting Action: Reject

Panel Statement:

The panel believes that the intent of 640.5 is clearly expressed in the present wording and that the proposed wording "excess" and "sufficient to prevent" are not definable with regard to the intent of 640.5.

The panel refers the Submitter to 300.23 for further clarification.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-47 Log #854 NEC-P12 (640-6) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the Panel's intent was to also accept the text deletions in the proposal. It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panels 3 and 16 for information.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 640.6 as follows:

640.6 Mechanical Execution of Work. Equipment and cabling shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the ~~structural components of the~~ building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D).

Substantiation:

Section 640.6 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (640.6). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables. It also makes "ceiling" plural. This is a companion proposal and is intended to correlate with similar proposals for 800.6, 820.6, 830.7, 725.6, 760.6, and 770.8.

Panel Meeting Action: Accept in Principle

In the recommended text, delete the words "by the" and "building structure".

Panel Statement:

The revised wording meets the intent of the submitter and provides greater clarity.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-48 Log #3496 NEC-P12Meeting Action: Accept (640-7) **Final Action: Reject**

TCC Action: Reject

The Technical Correlating Committee directs that this proposal be reported as "Reject" to correlate with the Technical Correlating Committee action on Proposal 12-1.

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:

640.7 Grounding.

(A) General. Wireways and auxiliary gutters shall be grounded and bonded in accordance with the requirements of Article 250. Where the wireway or auxiliary gutter does not contain power-supply wires, the equipment ~~grounding~~ bonding conductor shall not be required to be larger than 14 AWG copper or its equivalent. Where the wireway or auxiliary gutter contains power-supply wires, the equipment ~~grounding~~ bonding conductor shall not be smaller than specified in 250.122.

(B) Separately Derived Systems with 60 Volts to Ground. Grounding of separately derived systems with 60 volts to ground shall be in accordance with 647.6.

(C) Isolated Ground Receptacles. Isolated grounding-type receptacles shall be permitted as described in 250.146(D), and for the implementation of other technical power systems in compliance with Article 250. For separately derived systems with 60 volts to ground, the branch-circuit equipment ~~grounding~~ bonding conductor shall be terminated as required in 647.6(B).

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

JANIKOWSKI: See my Explanation of Negative on Proposal 12-22 (Log #1987).

WINFREY: See my Explanation of Negative Vote on Proposal 12-1.

Comment on Affirmative:

BURKE: See my Comment on Affirmative on Proposal 12-1.

12-48a Log #CP1204 NEC-P12 **Final Action: Accept**
(640.25)

Submitter: Code-Making Panel 12

Recommendation:

Revise existing text of 640.25 as follows:
"Loudspeakers installed in a fire resistance-rated partition, wall, or ceiling shall be listed for that purpose or installed in an enclosure or recess that maintains the fire resistance rating.
FPN: Fire-rated construction is the fire-resistive classification used in building codes. One method of determining fire rating is testing in accordance with NFPA 251-1999, Standard Methods of Tests of Fire Endurance of Building Construction and Materials."

Substantiation:

This change will clarify the purpose for listing and increase usability.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-48b Log #CP1205 NEC-P12 **Final Action: Accept**
(640.44)

Submitter: Code-Making Panel 12

Recommendation:

Revise the existing wording of 640.44 to read as follows:
"Portable equipment, not listed for outdoor use, shall be permitted only where appropriate protection of such equipment from adverse weather conditions is provided to prevent risk of fire or electrical shock. Where the system is intended to remain operable during adverse weather, arrangements shall be made for maintaining operation and ventilation of heat dissipating equipment."

Substantiation:

This change will clarify the purpose for listing and increase usability.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-49 Log #252 NEC-P12 **Final Action: Reject**
(645-1)

Submitter: Thomas L. Mason, The Ralph Tyler Companies

Recommendation:

Add new text to read as follows:
An informational technology equipment room is a space used for the installation and operation of information technology equipment such as cable patch panels, hubs, routers, switches, servers, modems, telephone switches, and power distribution equipment for the information technology equipment. Other electrical and non-electrical equipment may be present and storage of materials is permitted. A "data closet" or "telephone closet" containing active, powered devices is an information technology equipment room.

Substantiation:

"Information technology equipment room" is not presently defined in Article 645 or Article 100. Some authorities having jurisdiction and funding organizations are including data closets and telephone closets. Some are excluding them. Including them would reduce exposure to interruption of services in the event of fire.

Panel Meeting Action: Reject

Panel Statement:

Article 645 is not intended to include data closets and similar areas unless they comply with all of the conditions of 645.2. This is not typical of wiring closets. Additionally, general storage of materials in such environments would be expressly against the intent and the requirements of and NFPA 75.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

BURKE: Editorially modify the Panel Statement wording to "...against the intent and the requirements of ~~and~~ NFPA 75."

12-51 Log #1655 NEC-P12 **Final Action: Reject**
(645-5(5)(C))

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to multipurpose cable in the Code. Specifically delete:

645.5(5)(C) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM ~~and MP~~ (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R or G. Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

~~760.61(D) FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, CMG, CM), see 800.51.~~

Table 760.61 Delete the column "coaxial".

Table 800.50 Delete the rows for MPP, MPR and MP cables.

800.51~~(G) Multipurpose (MP) Cables. Until July 1, 2003, cables that meet the requirements for Types CMP, CMR, CMG, and CM and also satisfy the requirements of 760.71(B) for multiconductor cables and 760.71(H) for coaxial cables shall be permitted to be listed and marked as multipurpose cable Types MPP, MPR, MPG, and MP, respectively.~~

800.52(D) Cable Trays. Types ~~MPP, MPR, MPG, and MP multipurpose cables and~~ Types CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays. Communications raceways, as described in 800.51, shall be permitted to be installed in cable trays.

800.53(D) Cable Trays. Types ~~MPP, MPR, MPG, and MP multipurpose cables and~~ Types CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays.

Table 800.53 Delete MPP, MPR and MP.

Substantiation:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned Code-Making Panel 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

There are no requirements or specifications for the use of multipurpose cable versus the communications cables already specified. Consequently, the code panels are obliged to follow the Technical Correlating Committee directive and accept this proposal.

Panel Meeting Action: Reject

Panel Statement:

It is the understanding of the Panel that Type MP cable is still available and in use, and, therefore, should remain in the Code. The submitter has not provided any technical substantiation for the removal of Type MP cable. In addition, the Panel did not receive any directive from the Technical Correlating Committee to Accept this proposal.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-52 Log #1658 NEC-P12 **Final Action: Reject**
(645-5(5)(c))

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to Types OFNG, OFCG, and CMG in the Code. Specifically delete:

645.5(5)(c) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM and MP (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R ~~or G.~~ Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

Table 725.61 Delete CMG.

760.61(D) FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, ~~CMG~~, CM), see 800.51.

Table 760.61 Delete CMG.

Table 770.50 Delete the rows for OFNG and OFCG cables.

~~770.51(C) Types OFNG and OFCG. Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.~~

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

770.53(B)(2) Types ~~OFNG~~, OFN, ~~OFCG~~, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

770.53(B)(3) Types ~~OFNG~~, OFN, ~~OFCG,~~ and OFC cables shall be permitted in one- and two- family dwellings.

770.53(C) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 770.53(A) and (B) shall be Type ~~OFNG~~, OFN, ~~OFCG~~, or OFC. Such cables shall be permitted to be installed in listed general-purpose optical fiber raceways.

Table 770.53 Delete OFNG and OFCG.

Table 800.50 Delete the row for CMG.

800.51~~(C) Type CMG. Type CMG general-purpose communications cable shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.~~

800.52(D) Cable Trays. Types MPP, MPR, ~~MPG~~, and MP multipurpose cables and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be permitted to be installed in cable trays. Communications raceways, as described in 800.51, shall be permitted to be installed in cable trays.

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

800.53(C) Distributing Frames and Cross-Connect Arrays. Listed communications wire and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be used in distributing frames and cross-connect arrays.

800.53(D) Cable Trays. Types MPP, MPR, ~~MPG~~, and MP multipurpose cables and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be permitted to be installed in cable trays.

800.53(E)(1) General. Cables shall be Type ~~CMG or~~ Type CM. Listed communications general-purpose raceways shall be permitted. Only Types ~~CMG~~, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.

800.53(G) FPN: For information on Types CMP, CMR, ~~CMG~~, CM, and CMX cables, see 800.51.

Table 800.53 Delete CMG.

Table 820.53 Delete CMG.

Table 830.58 Delete CMG.

Substantiation:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

There are no requirements or specifications for the use of general-purpose "G" cables (OFNG, OFCG, CMG, MPG) versus the communications cables already specified. Consequently CMP 16 is obliged to follow the TCC directive and accept this proposal.

We believe that general-purpose "G" cables should be permitted to continue to be in the NEC. We recommend that the Code panel accept this proposal with a request to the TCC that it reconsider its position on inclusion of products that do not have specific application rules in the NEC. These cables were established because of an effort to harmonize the NEC and the Canadian Electrical Code. Richard Biermann, the TCC chairman, and Roy Hicks, the CEC head, submitted the proposals. A copy of one of their proposals is attached for reference. It's a shame that the current position of the TCC requires the removal of "G" cables from the Code.

General-purpose "G" cables could be retained if the TCC would change its position as follows:

The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC unless inclusion in the NEC is for purposes of correlating with other codes.

Panel Meeting Action: Reject

Panel Statement:

It is the understanding of the Panel that suffix designation "G" is available and in use, and, therefore, should remain in the Code. The submitter has not provided any technical substantiation for the removal of suffix designation "G" on cable.

Number Eligible to Vote: 13

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

JOHNSON: The submitter claims this is based on TCC (Technical Correlating Committee) direction. The TCC may wish to provide guidance on this issue. CMP-12 has not received TCC instructions about this.

12-52a Log #CP1206 NEC-P12 (645.5(B)) **Final Action: Accept**

Submitter: Code-Making Panel 12

Recommendation:

Revise existing 645.5(B) to read as follows:

"(B) Cord-and-Plug Connections. The data processing system shall be permitted to be connected to a branch circuit by any of the following listed means:

(1) Flexible cord and attachment plug cap not to exceed 4.5 m (15 ft).

(2) Cord set assembly. Where run on the surface of the floor, they shall be protected against physical damage."

Substantiation:

This change will clarify the purpose for listing and increase usability.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-53 Log #3520 NEC-P12 (645-5(C)) **Final Action: Accept in Principle**

Submitter: Stephen W. McCluer, American Power Conversion Corp

Recommendation:

Add new sentences:

Separate data processing units shall be permitted to be interconnected by means of cables and cable assemblies listed for the purpose. Where run on the surface of the floor, they shall be protected against physical damage. Where run between bays of modular utilization equipment configured as a single system, including non-adjacent bays, interconnection cables shall be protected against physical damage in devices listed for the purpose.

Substantiation:

The present language in 645.5(D) describes how to run cables under raised floors. Article 645 does not adequately address how to treat cables that are NOT run "on the surface of the floor." Historically, "data centers" have featured cabinets of electronic equipment mounted on raised floors. Article 645 permits power and data cables to be run under the raised floor provided that the facility meets all the requirements of 645.2 and 645.5(D). Today's information technology centers increasingly feature rows of equipment racks or bays mounted on solid floors. The nature of IT centers is that this utilization equipment is frequently reconfigured. Bays can be powered independently or they can be configured as a single, interconnected system of modular utilization equipment fed by a common, protected power source. In the latter case, power and data cables can be routed internally through the bays or in specially designed cable troughs on top of the equipment. This proposal acknowledges that modular IT utilization equipment exists and is in use today that is listed for the purpose by independent testing labs. Such listing ensures proper grounding of modular sections, protection of interconnection cables, and safety of personnel. When bays are separated, interconnection cables shall be required to be run in devices listed for the purpose. The language is broad enough to ensure that one technique is not favored to the exclusion of other techniques that could also be acceptable.

Panel Meeting Action: Accept in Principle

Revise the wording in the existing Code to read as follows:

"(C) Interconnecting Cables. Separate data processing units shall be permitted to be interconnected by means of listed cables and cable assemblies. Where exposed to physical damage, the installation shall be protected by approved means."

Panel Statement:

The revised wording meets the intent of the submitter and provides further clarity.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-54 Log #447 NEC-P12 **Final Action: Reject**
(645-5(D)(2))

Submitter: Gregory Skaper, Panduit Corporation

Recommendation:

Under raised floors (2): add metallic and nonmetallic cable tray as acceptable routing systems.

Substantiation:

Since these routing systems are under a raised floor, there is not a safety issue. The addition of both metallic and nonmetallic cable tray is consistent with current products under this section.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided any substantiation that wiring methods under a raised floor in an ITE room are not a safety issue.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

BURKE: For clarity, modify the Panel Statement wording to "The Panel believes that wiring methods under a raised floor in an ITE room are a safety issue." The submitter has not provided any substantiation that wiring methods under a raised floor in an ITE room are not a safety issue."

12-55 Log #448 NEC-P12 **Final Action: Reject**
(645-5(D)(2))

Submitter: Gregory Skaper, Panduit Corporation

Recommendation:

Under raised floors (2): add nonmetallic surface raceway as an acceptable routing system.

Substantiation:

Current systems include several that are nonmetallic. The routing of cables under the floor of information technology equipment is not a safety issue. The addition of nonmetallic surface raceway is consistent with current products stated.

Panel Meeting Action: Reject

Panel Statement:

Nonmetallic surface raceway is already included in 645.5(D)(2).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-56 Log #2384 NEC-P12 **Final Action: Reject**
(645-5(D)(2))

Submitter: Gregory Skaper, Panduit Corporation

Recommendation:

Under raised floors (2): add nonmetallic optical/communication routing assembly as an acceptable routing means.

Substantiation:

Current identified systems included several that are nonmetallic. The routing of the above cables under the floor of information technology equipment is not a safety issue. The above product is a new category initiated by UL (QBAA under UL 2024A) to address the needs of both manufacturer and end user. The addition of nonmetallic optical/communication routing assembly is consistent with current products already stated in the above article.

Panel Meeting Action: Reject

Panel Statement:

Item (2) is for branch circuit supply conductors only.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

JOHNSON: This may be appropriate as 5(D)(5)(e).

12-57 Log #3329 NEC-P12 **Final Action: Accept**
(645-5(D)(3))

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

Recommendation:

Revise the first sentence of 645.5(D)(3) to read:
Ventilation in the underfloor area is used for the information technology room only, except as provided in 645.2(2).

Substantiation:

Prior to the 1990 Edition of the National Electrical Code there was no provision permitting any HVAC system that serves other occupancies to also serve the information technology room as is now permitted if fire/smoke dampers are provided as shown in 645.2(2). Since the introduction of Article 645 into the National Electric Code in 1968, there has always been a provision that the ventilation in the underfloor area be used for the information equipment room only.

With the introduction in 645.2(2) of the permission for any HVAC system that serves other occupancies to also serve the information technology room if fire/smoke dampers are provided, it appears that the conditions required in 645.5(D)(3) will not be met if 645.2(2) is used. In this instance the cables, receptacles, and equipment permitted in 645.5(D) will not be permitted.

This was not the intent when Article 645 was revised for the 1990 Edition of the National Electrical Code and is not the intent in any later codes.

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

12-58 Log #330 NEC-P12 **Final Action: Accept**
(645-5(D)(5))

TCC Action:

The Technical Correlating Committee understands that the Panel Action on Proposal 12-61 modifies the Panel Action on this Proposal.

Submitter: James M. Daly, General Cable

Recommendation:

Revise 645.5(D)(5) as follows:
"Cables, other than those covered in (2) and those complying with (a), (b), or ~~and~~ (c), shall be ...".

Substantiation:

With the current word "and", it requires that cables comply with all three conditions - (a), (b), and (c). They must be installed in a raceway and must have been listed with equipment manufactured prior to July 1, 1994.

The proposed revision will require that cables comply with (2); (5)(a), (b), or (c); or be listed as Type DP.

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

12-59 Log #1027 NEC-P12 **Final Action: Accept**
(645-5(D)(5))

TCC Action:

The Technical Correlating Committee understands that the Panel Action on Proposal 12-61 modifies the Panel Action on this Proposal.

Submitter: Noel Williams Herriman, UT

Recommendation:

Change the text of this subsection to read as follows:
"Cables, other than those covered in (2) and those complying with (a), (b), or (c), shall be listed as Type DP cable . . ." (Remainder to remain as is.)

Substantiation:

As currently written, this rule effectively says the choice is between two possibilities, those cables complying with (2) and those cables complying with (a), (b), and (c), that is, those complying with (a) AND (b) AND (c). This results in a seemingly absurd requirement because it requires all of those special cable types listed in (c), even those with a plenum rating, to be enclosed in a raceway and be of a listed type manufactured before July, 1994. Nevertheless, the rule is often read this way, simply because that is how it is written. This obvious but erroneous reading forces users to try to find nonexistent types of DP cable. When a question about the meaning of this section was posed to the CMP chair at the panel reports in May 2001, the answer, somewhat glib perhaps, was "if that's what it says, that's what it means." This submitter believes the only reasonable interpretation is "those complying with (2) and those complying with (a) and those complying with (b) and those complying with (c)," but this interpretation is a bit of a leap from the literal wording. A primary benefit of Article 645 is in the relaxation of the restrictions on wiring in "other space for environmental air" for those users who comply with all of the requirements of 645.2. However, the literal wording of the section in question erases that benefit. The NEC could easily be clearer on this point, and changing a single word from "and" to "or" should accomplish that end.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

TROUT: The panel action on this proposal should have been "Accept in principle". The Panel statement should read: See panel action and statement on Proposal 12-61.

12-60 Log #1282 NEC-P12 **Final Action: Reject**
(645-5(D)(5))

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(5) Cables and raceways, other than those covered in (2) and those complying with (a), (b), (c)and ~~(c)~~, (d), shall be listed as Type DP cable or as a listed raceway having adequate fire-resistant characteristics suitable for use under raised floors of an information technology equipment room.
(a) Interconnecting cables enclosed in a raceway.
(b) Interconnecting cables listed with equipment manufactured prior to July 1, 1994, being installed with that equipment.
(c) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM and MP (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R or G. Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.
FPN: One method of defining fire resistance is by establishing that the cables do not spread fire to the top of the tray in the "Vertical Tray Flame Test" referenced in ANSI/UL 1581-1991, Standard for Electrical Wires, Cables, and Flexible Cords. Another method of defining fire resistance is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA "Vertical Flame Test — Cables in Cable Trays," as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(d) Listed Nonmetallic Raceways per 770.6, Exception and 800.48 when used with the appropriate cable.

Substantiation:

Listed Optical Fiber/Communication Raceways are used with Optical Fiber and Communication Cabling per Article 770 and 800. These raceways have been used for the removal of abandon cables and are ideal for the raised floor applications.

Panel Meeting Action: Reject

Panel Statement:

645.5(D)(5)(c) provides the sections for the various cables that provide raceway information. The panel does not understand the meaning of the Submitter's substantiation as it does not appear to match the Recommendation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-59a Log #CP1200 NEC-P12 **Final Action: Accept**
(645.5(D)(5))

Submitter: Code-Making Panel 12

Recommendation:

In the fine print note to 645.5(D)(5), change "ANSI/UL" 1581 1991" to "ANSI/UL 1581 2001", and change "CSA C22.2 No. 0.3-M 1985" to "CSA C22.2 No. 0.3-M 2001."

Substantiation:

Both the UL and CSA standards referenced in this Fine Print Note have been updated since the editions referenced.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-61 Log #3214 NEC-P12 **Final Action: Accept in Principle**
(645-5(D)(5) and New 645.5 (D) (5) (d))

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 3 for information.

Submitter: Gary W. Victorine San Jose, CA

Recommendation:

Revise 645.5(D)(5) as follows:
"(5) Cables, other than those covered in (2) ~~and~~ or those complying with (a), (b), ~~and~~ (c) or (d), shall be listed...".
Add new 645.5(D)(5)(d) as follows:
(d) Power supply cord of Listed Information Technology Equipment.

Substantiation:

The current wording of 645.5(D) is prompting AHJs to apply DP cable requirements to all wiring located under the raised floor, including the integral power supply cords of listed equipment. It was never the intent of the authors that introduced the DP cable requirement into the 1993 NEC to include the listed equipment power cord under the DP cable requirement. I was a member of the task group that submitted the proposal for the 1993 NEC. At that time, no one thought it necessary to specifically exclude equipment power supply cords from the DP cable requirement since these cables are part of the listed information technology equipment and not generally considered to be part of the building wiring. The proposed wording adds the power supply cord of Listed Information Technology Equipment as another category where the DP cable requirement does not apply.

645.5(D)(5) is also revised to change "and" to "or" in two places since it's obvious that meeting only one of the conditions is sufficient, rather than needing to meet all noted conditions.

The following is offered as further substantiation of the proposed revision to 645.5(D).

A. As compared to other equipment interconnect cabling, the power supply cord(s) of listed equipment contribute negligible fuel load to the under-the-raised-floor area. There are a limited number of power supply cords per product, even considering use of redundant power supply cords. The length of the power supply cord is restricted by the listing requirements. Further, part of the supply cord is typically above the floor to allow connection to the equipment.

B. Articles 725 and 800 also require cables for general-purpose use to meet the vertical tray flame test. DP cable fire resistance requirements were designed to be consistent with the Article 725 and 800 requirements. However, Articles 725 and 800 don't impose these fire resistance requirements on the power supply cords of listed equipment installed in the same areas.

C. The addition of the DP cable requirement to Article 645 was intended to allow development of listing requirements for a computer interconnect cable that meets the vertical tray flame test but does not necessarily have the circuit limitations of Class 2, Class 3 (Article 725), or Communications Circuits (Article 800). DP cable was never intended to replace the flexible cords of Article 400, which are commonly used for the power supply cord of Listed ITE.

D. The Panel Comments from Mr. Poch and Mr. Burke from Proposal 12-101 of the 2002 NEC are valid comments and further substantiate this proposal. (Comments are not included as part of this proposal).

Panel Meeting Action: Accept in Principle

In the Recommended wording the first instance of the word "and" is to be retained and the following word "or" is to be deleted.

Panel Statement:

The revised wording clarifies the intended meaning of the Panel, and meets the intent of the Submitter.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

TROUT: The panel action on this proposal should have been "Accept in Principle in Part." The recommended wording of 645.5(D)(5) should read: "(5) Cables, other than those covered in (2) and those complying (a), (b) ~~and~~, or (c) shall be listed as Type DP cable having adequate fire-resistant characteristics suitable for use under raised floors of an information technology equipment room." The rest to remain as is.

The panel does not accept the recommendation to add a new 645.5(D)(6) to read:
(d) Power supply cord of Listed Information Technology Equipment.

Panel statement should read: The requirements of 645.5(D)(5) are clear. Cables used under raised floors of an information technology room shall have adequate fire-resistant characteristics suitable for use under raised floors of an Information Technology Room. Power supply cords used under raised floors are required to meet the fire-resistant characteristics.

Article 645 was rewritten to relax the rules for wiring under raised floors. The area under a raised floor where ventilation is provided is a plenum. The rules for wiring in a plenum area are covered in 300.21. These rules were established so that the possible spread of fire or products of combustion will not be substantially increased. 300.22(C)(1) contains the restrictive rules for wiring methods in "Other Space Used for Environmental Air" to accomplish the intent of 300.21 regarding the spread of fire or products of combustion. 300.22(D) refers to Information Technology Equipment and permits the wiring in air-handling areas beneath raised floors for information technology equipment to be installed in accordance with Article 645 rather than following the rules established in 300.22(C)(1).

Relaxation of the rules for wiring under raised floors in an Information Technology Room was carefully considered by the task group and subsequently by the members of Panel 12 where it was determined that to properly maintain the required safety from the spread of fire or products of combustion all conductors and cables not enclosed in raceways or having other approved covering must pass a "Vertical Tray Flame Test" to determine the fire resistant qualities of the cable. The acceptance of these requirements was by a unanimous vote. The unsubstantiated statement of the submitter of Proposal 12-61 that this was not the intent of the task group or the members of panel 12 appears rather self-serving.

Part A of the submitter's substantiation expresses an unsubstantiated statement that power supply cords of listed equipment contribute negligible fuel load to the under floor area and that there are a limited number of supply cords per product and that the length of the power supply cord is restricted by the listing requirements. The submitter failed to mention that the length of the power supply cord is limited to 15 feet by 645.5(B) and that there is no limit on the pieces of equipment that may be installed in an ITE room. The panel member representing the Information Technology Industry Safety Council confirmed, when questioned during panel discussion, that 100 or even more pieces of information technology equipment requiring power supply cords could be located in one ITE room. This equates to a possible 1500 feet or more of power supply cord that may be used under a raised floor. This is certainly not a negligible

contribution to the fuel load.

Part B of the submitter's substantiation relates to Articles 725 and 800 where these Articles require cables to meet the vertical flame test but do not impose these "fire resistance" requirements on the power supply cords of listed equipment. The submitter does not mention that these articles do not cover power supply cords under raised floors in ITE rooms.

Part C of the submitter's substantiation tells us that DP cable was never intended to replace the flexible cords of Article 400, which are commonly used for the power supply cord of listed ITE. The submitter is correct. DP cable was not intended to replace the flexible cords of Article 400. DP cable was intended to be used as a power supply cord only if it was intended to be used as a power supply cord under a raised floor in an ITE room.

Part D of the submitter's substantiation refers to comments made by Mr. Poch and Mr. Burke on Proposal 12-101 of the 2002 NEC. Both Mr. Poch and Mr. Burke made reference to limited amounts of flexible cord under a raised floor having minimal impact, which does not present a true picture of the amounts that may be used. Mr. Poch and Mr. Burke both referred to current usage of power supply cords in violation of the provisions of 645.5(D)(5) and suggest that the remedy is to change the requirements of 645.5(D)(5) to bring these violations into conformance with Code. This proposal was rejected by a 10 to 2 majority of Panel 12. There were no comments presented during the ROC stage of the 2002 NEC.

The purpose of the meetings of the NEC Code-Making Panels in the proposal stage is to determine which proposals enhance or maintain the safety provisions of the Code. This proposal does not enhance or maintain safety. It is a serious degradation of a requirement designed to protect persons and property from the hazards of fire. There are other alternatives to the further relaxation of safety rules to accommodate the use of power supply cords. The receptacles could be installed above the floor with the cables being protected from physical damage as is required for interconnecting cables in 645.5(C). Power supply cables listed as having fire-resistant characteristics can be developed and surely would have been developed in accordance with the demand if the present rules were properly enforced.

It was expressed at the ROP meeting by the Underwriters Representative on CMP 12 that Underwriters Laboratories would not object to the acceptance of the submitter's proposal but failed to give any supporting information that would indicate why Underwriters Laboratories would support using cables that had not been listed as having fire-resistant characteristics under a raised floor in an Information Technology Room.

12-50 Log #1654 NEC-P12 **Final Action: Reject**
(645-5(D)(5)c)

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panels 3 and 16 for information.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Revise 645.5(5)(C) as follows:

645.5(5)(C) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Type~~s~~ CM ~~and MP~~ (Article 800); and Type CATV (Article 820). Cable substitutions in compliance with Table 725.61, Table 760.61, Table 770.53, Table 800.53, Table 820.53 and Table 830.58 shall be permitted. ~~These designations shall be permitted to have an additional letter P or R or G~~. Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

Substantiation:

The current text, that explicitly mentions and permits plenum, riser and general purpose cables to substitute for the cables in the first sentence, has to be monitored each code cycle for additions and deletions of cables. This code cycle, proposals have been made to eliminate multipurpose and general purpose "G" cables and to create several new types of cables. By referencing the permitted substitutions rather than explicitly stating them, it is easier to keep Article 645 correlated with Articles 725, 760, 770, 800, 820, and 830.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided any definitive substantiation that a problem exists in the field with the present wording. Code-Making Panel 12 has jurisdiction over types of cables that are permitted to be used under raised floors in ITE rooms. The submitter is incorrect in his assumption that Code-Making Panel 12 is obligated to permit cables for use under raised floors based on the actions of other Code-Making Panels.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

JOHNSON: Reconsideration based on CMP-16 actions may be appropriate during the comment period.

12-62 Log #2123 NEC-P12 **Final Action: Accept**
(645-5(D)(5)(c))

Submitter: L. Keith Lofland, International Association of Electrical Inspectors

Recommendation:

Revise section 645.5(D)(5)(c) to read as follows:
Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM and MP (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R or G. Green or green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

Substantiation:

As this section is now written, only a green conductor, with one or more yellow stripes would be allowed to serve as an equipment grounding conductor. This conflicts with Section 250.119, which allows "either green or green with one or more yellow stripes" to identify an equipment grounding conductor. ROP 12-103 and ROC 12-42 from the 2002 NEC (both accepted) seem to ask for this clarification as well.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-63 Log #1127 NEC-P12 **Final Action: Accept**
(645-11)

Submitter: Thomas M. Burke, Underwriters Laboratories Inc.

Recommendation:

Revise as follows:
645.11 Uninterruptible Power Supplies (UPS). ~~Unless otherwise permitted~~ Except for installations and constructions covered in (1) or (2), UPS systems installed within the information technology room, and their supply and output circuits, shall comply with 645.10. The disconnecting means shall also disconnect the battery from its load.
(1) Installations qualifying under the provisions of Article 685.
(2) Power sources ~~capable of supplying~~ limited to 750 volt-amperes or less derived either from UPS equipment or from battery circuits integral to electronic equipment.

Substantiation:

During previous attempts by Code-Making Panel 12 to editorially revise Section 645.11 to make it complaint with the NEC Manual of Style, the resulting modifications resulted in a requirement that does not match the original intent of Code-Making Panel 12. Since all UPS equipment and batteries are "power sources capable of supplying 750 volt-amperes or less." the requirement as it reads today could unintentionally exempt every construction from the disconnect requirement in Section 645.10. The original intent of Code-Making Panel 12 was to only exempt those constructions limited to 750 volt-amperes or less. The proposed revision would make the requirement aligned with Code-Making Panel 12's original intent.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

12-64 Log #2267 NEC-P12 **Final Action: Reject**
(647-3)

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
647.3 General. Use of a separately derived 120-volt single-phase 3-wire system with 60 volts on each of two ungrounded conductors to a ~~grounded~~ earth neutral conductor shall be permitted for the purpose of reducing objectionable noise in sensitive electronic equipment locations provided that the following conditions apply:
(1) The system is installed only in commercial or industrial occupancies.
(2) The system's use is restricted to areas under close supervision by qualified personnel.
(3) All of the requirements in 647.4 through 647.8 are met.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

See Panel Action and Statement on Proposal 12-32.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-65 Log #3030 NEC-P12 **Final Action: Accept in Principle**
(647-4(A))

Submitter: Todd Lottmann St Louis, MO

Recommendation:

Revise 647.4(A) to read:
(A) Panelboards and Overcurrent Protection. Use of standard single-phase panelboards and distribution equipment with a higher voltage rating shall be permitted. The system shall be clearly marked on the face of the panel or on the inside of the panel doors. ~~Common trip two-pole circuit breakers that are identified for operation at the system voltage shall be provided for both ungrounded conductors in all feeders and branch circuits.~~ Branch circuits and feeders shall be provided with a means to disconnect simultaneously all ungrounded conductors.

Substantiation:

The disconnection of feeder and branch circuits should not be limited only to circuit breakers, which is the way this requirement currently reads. The issue is the disconnection of both ungrounded conductors, similar to multiwire branch circuits. The proposed wording meets the intent of the existing language, but allows both circuit breakers and switches to be utilized.

Panel Meeting Action: Accept in Principle

Revise the wording in the recommendation to read as follows:

"(A) Panelboards and Overcurrent Protection. Use of standard single-phase panelboards and distribution equipment with a higher voltage rating shall be permitted. The system shall be clearly marked on the face of the panel or on the inside of the panel doors. Common trip two pole circuit breakers or a combination two pole fused disconnecting means that are identified for use at the system voltage shall be provided for both ungrounded conductors in all feeders and branch circuits. Branch circuits and feeders shall be provided with a means to simultaneously disconnect all ungrounded conductors."

Panel Statement:

Section 647.4(A) addresses overcurrent protection as well as disconnecting means. This change should satisfy the concerns of the submitter.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-66 Log #2268 NEC-P12 **Final Action: Reject**
(647-6(B))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
647.6 Grounding.
(A) General. The system shall be grounded as provided in 250.30 as a separately derived single-phase 3-wire system.
(B) Grounding Conductors Required. Permanently wired utilization equipment and receptacles shall be grounded by means of an equipment grounding conductor run with the circuit conductors to an equipment grounding bus prominently marked "Technical Equipment Ground" in the originating branch-circuit panelboard. The grounding bus shall be connected to the ~~grounded~~ earth conductor on the line side of the separately derived system's disconnecting means. The grounding conductor shall not be smaller than that specified in Table 250.122 and run with the feeder conductors. The technical equipment grounding bus need not be bonded to the panelboard enclosure. Other grounding methods authorized elsewhere in this *Code* shall be permitted where the impedance of the grounding return path does not exceed the impedance of equipment grounding conductors sized and installed in accordance with this article.
FPN No. 1: See 250.122 for equipment grounding conductors sizing requirements where circuit conductors are adjusted in size to compensate for voltage drop.
FPN No. 2: These requirements limit the impedance of the ground fault path where only 60 volts apply to a fault condition instead of the usual 120 volts.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 12-32.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-67 Log #3497 NEC-P12Meeting Action: Accept **Final Action: Reject**
(647-6(B))

TCC Action: Reject

The Technical Correlating Committee directs that this proposal be reported as "Reject" to correlate with the Technical Correlating Committee action on Proposal 12-1.

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:

(B) Grounding Conductors Required. Permanently wired utilization equipment and receptacles shall be grounded by means of an equipment ~~grounding~~ bonding conductor run with the circuit conductors to an equipment ~~grounding~~ bonding bus prominently marked "Technical Equipment Ground" in the originating branch-circuit panelboard. The grounding bus shall be connected to the grounded conductor on the line side of the separately derived system's disconnecting means. The ~~grounding~~ bonding conductor shall not be smaller than that specified in Table 250.122 and run with the feeder conductors. The technical equipment ~~grounding~~ bonding bus need not be bonded to the panelboard enclosure. Other grounding methods authorized elsewhere in this Code shall be permitted where the impedance of the grounding return path does not exceed the impedance of equipment ~~grounding~~ bonding conductors sized and installed in accordance with this article.

FPN No. 1: See 250.122 for equipment ~~grounding~~ bonding conductor sizing requirements where circuit conductors are adjusted in size to compensate for voltage drop.

FPN No. 2: These requirements limit the impedance of the ground fault path where only 60 volts apply to a fault condition instead of the usual 120 volts. 640.7 Grounding.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

JANIKOWSKI: See my Explanation of Negative on Proposal 12-22 (Log #1987).

WINFREY: See my Explanation of Negative Vote on Proposal 12-1.

Comment on Affirmative:

BURKE: See my Comment on Affirmative on Proposal 12-1.

12-68 Log #2270 NEC-P12 **Final Action: Reject**
(647-7(A) (3) & (4))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
647.7 Receptacles.
(A) General. Where receptacles are used as a means of connecting equipment, the following conditions shall be met:
(1) All 15- and 20-ampere receptacles shall be GFCI protected.
(2) All outlet strips, adapters, receptacles covers, and faceplates shall be marked with the following words or equivalent:
WARNING - TECHNICAL POWER
Do not connect to lighting equipment.
For electronic equipment use only.
60/120 V. 1 ac
GFCI protected
(3) A 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet having one of its current-carrying poles connected to a ~~grounded~~ earth circuit conductor shall be located within 1.8 m (6 ft) of all permanently installed 15- or 20-ampere-rated 60/120-volt technical power system receptacles.
(4) All 125-volt receptacles used for 60/120-volt technical power shall have a unique configuration and be identified for use with this class of system. All 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlets and attachment plugs that are identified for use with ~~grounded~~ earth circuit conductors shall be permitted in machine rooms, control rooms, equipment rooms, equipment racks, and other similar locations that are restricted to use by qualified personnel.
(B) Isolated Ground Receptacles. Isolated ground receptacles shall be permitted as described in 250.146(D); however, the branch circuit equipment grounding conductor shall be terminated as required in 647.6(B).
(C) Screw-shell. Luminaires installed under this section shall not have an exposed lamp screw-shell.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

See panel action and atatement on Proposal 12-32.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

JANIKOWSKI: See my Explanation of Negative on Proposal 12-22 (Log #1987).

12-69 Log #3498 NEC-P12Meeting Action: Accept **Final Action: Reject**
(647-7(B))

TCC Action: Reject

The Technical Correlating Committee directs that this proposal be reported as "Reject" to correlate with the Technical Correlating Committee action on Proposal 12-1.

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(B) Isolated Ground Receptacles. Isolated ground receptacles shall be permitted as described in 250.146(D); however, the branch circuit equipment ~~grounding~~ bonding conductor shall be terminated as required in 647.6(B).

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

WINFREY: See my Explanation of Negative Vote on Proposal 12-1.

Comment on Affirmative:

BURKE: See my Comment on Affirmative on Proposal 12-1.

12-70 Log #3436 NEC-P12 **Final Action: Reject**
(647-7(B), FPN)

Submitter: Robert Schuerger, EYP Mission Critical Facilities, Inc.

Recommendation:

Revise as follows:
647.7(B) ~~Isolated~~ Insulated Ground Receptacles. ~~Isolated~~ Insulated ground receptacles shall be permitted as described in 250.146(D); however, the branch circuit equipment grounding conductor shall be terminated as required in 647.6(B).
Exception: Where ~~an isolated~~ insulated ground receptacle is installed in a nonmetallic box, a metal faceplate shall be permitted if the box contains a feature or accessory that permits the effective grounding of the faceplate.

Substantiation:

The use of the term "isolated" has caused confusion which has led to improper and unsafe installations in which a separate grounding electrode and grounding system is installed isolated from the rest of the building's grounding system. Since the separate grounding system is not properly bonded to the building's grounding system, a significant voltage can be developed between the two grounding systems in the case of lightning or an electrical fault. This creates a significant hazard for both personal injury and fire. There have been many cases of this type of installation in the past, particularly with machine tools, data processing equipment and other sensitive electronic equipment installations.
Changing "isolated" to "insulated" also brings this section in alignment with the existing Section 517.16 Receptacles with Insulated Grounding Terminals.
This text is also being proposed for the revision of IEEE Std 1100, Powering and Grounding Electronic Equipment.

Panel Meeting Action: Reject

Panel Statement:

The submitter's substantiation is in error, as an isolated ground is not isolated from the building grounding system. An isolated ground is required to be properly bonded to the building grounding system. An isolated ground does not present any hazard with regard to personal injury or fire. The submitter does not appear to have an understanding of isolated ground receptacles having the grounded terminal purposely insulated from the receptacle's mounting means.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

JONES: I agree with the submitter. The term "isolated" has caused confusion that has led to improper and unsafe installations. Some designers of electrical circuits insist that these isolated grounding conductors terminate at a grounding electrode separate (isolated) from the system grounding electrode. This type of incorrect installation will present a significant hazard for both personal injury and fire. 250.146(D) uses the term insulated to describe an isolated ground receptacle. Changing the term "isolated" to "insulated" will help clarify the purpose of an isolated ground receptacle.

Comment on Affirmative:

TROUT: The panel action to reject is proper, however the panel statement indicates that the panel misunderstood the submitter's substantiation. The second sentence in the substantiation references what would be the result of an improper and unsafe installation as referred to in the first sentence. The panel statement should be revised to read:
The panel disagrees that the present text causes confusion. The submitter did not provide any definitive substantiation indicating improper and unsafe installations caused by the present text. 517.16 refers to "Receptacles with Insulated Terminals." The receptacle grounding terminal is purposely insulated from the receptacle mounting means to "isolate" the receptacle from the grounding system at that point. 250.126(D) confirms the use of the terminology "Isolated Receptacles."
The proposal indicates a reference to a fine print note, which is nonexistent and is not proposed. An exception is shown with a revision, however there is no exception in the present text. If the exception shown is a proposed addition, the requirements proposed in the exception are identical to an existing exception to 406.2(D) Isolated Ground Receptacles.

12-71 Log #648 NEC-P12 **Final Action: Reject**
(668-21(A))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise second sentence:
Power for these circuits shall be supplied through isolating transformers with an ungrounded secondary.

Substantiation:

Isolating transformers do not necessarily have ungrounded secondaries; they may be grounded or ungrounded. A grounded secondary can supply ungrounded circuits, such as a 120/240-volt secondary with a grounded center tap supplying a 240-volt 2-wire circuit. Ungrounded secondaries are specified in 668.20(B) and 680.23(A)(2). The Style Manual indicates lack of consistency in stating similar requirements may indicate a different intent and cause confusion.

Panel Meeting Action: Reject

Panel Statement:

Ungrounded secondary circuits are already required by 668.21(A).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-72 Log #651 NEC-P12 **Final Action: Reject**
(669-2)

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise text to read as follows:
Except as modified by this article, wiring and equipment used for electroplating processes ~~shall comply with~~ the applicable ~~requirements~~ provisions of Chapters 1 through 4 shall apply.

Substantiation:

Edit. In addition to complying with applicable requirements (rules, per se:) applicable provisions which are not rules, but permissive, should be included.

Panel Meeting Action: Reject

Panel Statement:

The substantiation does not document any problem with the current language.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-72a Log #CP1202 NEC-P12 **Final Action: Accept**
(669.2)

Submitter: Code-Making Panel 12

Recommendation:

Delete entire section 669.2.

Substantiation:

The existing language is unecessary and covered by 90.3. This will also reserve the .2 for Definitions.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Sequence Number 12-73 is not used.

12-74 Log #3045 NEC-P12 **Final Action: Accept**
(670-1, FPN)

Submitter: Todd F. Lottmann Washington, MO

Recommendation:

Update reference to NFPA 79-2002.
FPN: For further information, see NFPA 79 ~~1997~~ 2002, Electrical Standard for Industrial Machinery.

Substantiation:

This proposal is the work of a Task Group from Technical Committee of Electrical Requirements for Industrial Machines, NFPA 79. The Task Group consisted of the following members of CMP12 and NFPA 79.
Paul Dobrowsky, NFPA 79 and CMP-5; Jim Carroll, NFPA 79 and CMP-9; Tom Garvey, NFPA 79 and CMP-11; Lynn Saunders, NFPA 79 and CMP-11; Jim Pierce, NFPA 79 and CMP-18; Wayman Withrow, NFPA-79; David Quave, CMP-12; Scott Cline, CMP-12, and Andy Cartal.
The Task Group notes that the 2002 edition of NFPA 79 was recently issued. This change updates the FPN reference to the current edition of NFPA 79.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-75 Log #3244 NEC-P12 (670-2) **Final Action: Reject**

Submitter: Paul Dobrowsky Holley, NY

Recommendation:

Revise as follows:
Industrial Machinery (Machine). ~~A~~ An electrically power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package. [The associated electrical equipment, including the logic controller(s) and associated software or logic together with the machine actuators and sensors, are considered as part of the industrial machine.]

Substantiation:

As presently written, interpretations are made that if a motor is not present, then it is not an industrial machine. Other types of equipment, that do not have motors, but are test equipment, or electric discharge equipment and should follow the same requirements.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided any definitive substantiation that the present text of 670.2 has created any problems with the installation of industrial machinery. The panel believes that the current defintion already covers the Submitter's concern that a machine does not need to have a motor.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-76 Log #2792 NEC-P12 (670-3) **Final Action: Reject**

Submitter: William E. Anderson, The Procter & Gamble Company

Recommendation:

Revise text as follows:
670.3 Machine Nameplate Data
(A) Permanent Nameplate. A permanent nameplate that lists supply voltage, phase, frequency, full-load current, the maximum ampere rating of the short-circuit and ground-fault protective device, ampere rating of largest motor or load, short-circuit interrupting rating of the machine over current-protective device, if furnished, and diagram number shall be attached to the control equipment enclosure or machine where plainly visible after installation.
The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked "full-load current." Where more than one incoming supply circuit is to be provided, the nameplate shall state the above information for each circuit.
To:
670.3 Machine Nameplate Data.
(A) Control equipment shall be legibly and durably marked in a way that it is plainly visible after the equipment is installed. A nameplate giving the following information shall be attached to the enclosure:
(1) Name or trademark of supplier
(2) Serial number, where applicable
(3) Rated voltage, number of phases and frequency (if ac), and full-load current for each supply
(4) Ampere rating of the largest motor or load
(5) Maximum ampere rating of the short-circuit and ground-fault protective device, where provided
(6) Short-circuit interrupting rating of the machine overcurrent protective device, where furnished as part of the equipment
(7) Electrical diagram number(s) or the number of the index to the electrical drawings
The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked "full-load current." Where more than one incoming supply circuit is to be provided, the nameplate shall state the above information for each circuit.

Substantiation:

This proposal is intended to align with the latest edition of NFPA 79 specifically 17.4, Machine Nameplate Data.

Panel Meeting Action: Reject

Panel Statement:

See Panel Action on Proposal 12-82. The alignment with NFPA 79 was accomplished in the action taken on Proposal 12-82.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-77 Log #3245 NEC-P12 **Final Action: Reject**
(670-3)

Submitter: Paul Dobrowsky Holley, NY

Recommendation:

Revise the nameplate requirements into a list and add the following:
Minimum Conductor size ___
Maximum Overcurrent Protective Device ___
Maximum Overcurrent Protective Short-Circuit Interrupting Rating, whether provided or not
Largest Motor Current Rating___, from the motor nameplate

Substantiation:

The machine builder is in the best position to provide this information. This is already as a similar concept for Article 440 equipment. The present motor information is not provided consistently between various machine builders, some use table values and others use nameplate data.

Panel Meeting Action: Reject

Panel Statement:

See Panel Action and Statement on Proposal 12-76. No definitive substantiation has been provided for the inclusion of the additional nameplate requirements.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-78 Log #3260 NEC-P12 **Final Action: Reject**
(670-3)

Submitter: Gary J. Locke, Lockheed Martin Systems Integration

Recommendation:

Revise as follows:
670.3 ~~Machine Nameplate Data.~~
~~(A) Permanent Nameplate. A permanent nameplate that lists supply voltage phase, frequency, full-load current, the maximum ampere rating of the short-circuit and ground-fault protective device, ampere rating of largest motor or load, short-circuit interrupting rating of the machine overcurrent protective device, if furnished, and diagram number shall be attached to the control equipment enclosure or machine where plainly visible after installation.~~
~~The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth require oversized conductors or permit reduced size conductors, the required capacity shall be included in the marked "full-load current." Where more than one incoming supply circuit is to be provided, the nameplate shall state the above information for each circuit. The second paragraph of 670.3(A) has been revised to recognize that the operating characteristics of an industrial machine may permit the use of a feeder demand factor, as covered in 430.26. An industrial machine containing motors that are sized for high torque, but that in normal operation run at close to no load current values, is an example of where it may be appropriate to reduce the full load current marking on the machine nameplate.~~
~~(B)~~ Overcurrent Protection. Where overcurrent protection is provided in accordance with 670.4(B), the machine shall be marked "overcurrent protection provided at machine supply terminals."

Substantiation:

The purpose of this proposal is to remove text that is redundant with that of NFPA 79, Electrical Standard for Industrial Machinery 2002 Edition Section 17.4.1. The NFPA 79 Technical Committee on Electrical Equipment of Industrial Machinery has addressed the nameplate requirements for electrical equipment of industrial machinery making the provisions of NFPA 70 670-3 redundant and thereby not required.

Panel Meeting Action: Reject

Panel Statement:

The panel contends that the nameplate is essential for the installation guidelines contained in Article 670. The needs of NFPA 70 and NFPA 79 are not identical. See Panel Action on 12-82.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-79 Log #3306 NEC-P12 **Final Action: Reject**
(670-3 and (C) (New))

Submitter: Nicholas T. Abbatiello

Recommendation:

Revise as follows:
670.3 Machine Nameplate Data and Marking.
(C) Arc Flash Protection. Where the machine is provided arc flash protection employing energy limiting devices such as Class J, RK-1, etc. fuses and connected to a supply voltage of 600 volts or less, the warning marking in 110.16 shall not be required.

Substantiation:

There is evidence that the let through energy to industrial control panels sized 20 in. x 20 in. x 20 in., where three phase arc faults occur, that the flash protection boundary is only 6 in. from the fault; the threshold of an incurable burn is about 3 in. This type of hazard is very benign and within the general expectations of most technicians, electricians, engineers, etc. The general marking can cause confusion and use of unnecessary PPE which could introduce an associated risk such as loss of manual dexterity and visual acumen which could actually increase risk to some hazard. NFPA 70E gives implication that common lightweight leather gloves provide adequate protection for this type of hazard. Such gloves are commonly used during diagnosis, where it is necessary to work near live parts. Also, effective April 23, 2003, UL 508A will require that all industrial control panels used for industrial machinery to be so protected. Additional support for this is available from fuse manufacturers such as Bussman's SPD manual (URL:http://www.bussmann.com/apen/pubs/).

Panel Meeting Action: Reject

Panel Statement:

The use of energy limiting devices does not eliminate the hazard.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-80 Log #2793 NEC-P12 **Final Action: Accept in Principle**
(670-3(A))

Submitter: William E. Anderson, The Procter & Gamble Company

Recommendation:

Revise text as follows:
If the Proposal to revise NEC 670.3(A) to Revise wording to NEC 670.3(A) to align with the 2002 edition of NFPA 79 17.4 Machine Name Plate Data is accepted.
Revise original proposed revision from:
670.3 Machine Nameplate Date.
(A) Control equipment shall be legibly and durably marked in a way that it is plainly visible after the equipment is installed. A nameplate giving the following information shall be attached to the enclosure:
(1) Name or trademark of supplier
(2) Serial number, where applicable
(3) Rated voltage, number of phases and frequency (if ac), and full-load current for each supply
(4) Ampere rating of the largest motor or load
(5) Maximum ampere rating of the short-circuit and ground-fault protective device, where provided
(6) Short-circuit interrupting rating of the machine overcurrent protective device, where furnished as part of the equipment
(7) Electrical diagram number(s) or the number of the index to the electrical drawings
The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked "full-load current." Where more than one incoming supply circuit is to be provided, the nameplate shall state the above information for each circuit.
To:
(A) Control equipment shall be legibly and durably marked in a way that it is plainly visible after the equipment is installed. A nameplate giving the following information shall be attached to the enclosure:
(1) Name or trademark of supplier
(2) Serial number, where applicable
(3) Rated voltage, number of phases and frequency (if ac), and full-load current for each supply
(4) Ampere rating of the largest motor or load
(5) Maximum ampere rating of the short-circuit and ground-fault protective device, where provided
(6) Short-cirucit interrupting rating of the machine overcurrent protective device, where furnished as part of the equipment or short-circuit rating of the equipment if an overcurrent protective device is not provided
(7) Electrical diagram number(s) or the number of the index to the electrical drawings
The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked "full-load current." Where more than one incoming supply circuit is to be provided, the nameplate shall state the above information for each circuit.

Substantiation:

This proposal is intended to align with the current edition of NFPA 79 specifically 17.4, Machine Nameplate Data, and provide the necessary information to select the correct overcurrent protective device for the supply circuit and the machine.

Panel Meeting Action: Accept in Principle

Panel Statement:

See Panel Action on Proposal 12-82.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-82 Log #3047 NEC-P12 **Final Action: Accept**
(670-3(A))

TCC Action:

The Technical Correlating Committee understands that the Panel Action on Proposal 12-81 modifies the Panel Action on this Proposal.

Submitter: Todd F. Lottmann Washington, MO

Recommendation:

Revise 670.3(A) first paragraph as follows. Retain existing second paragraph.
670.3 Machine Nameplate Data.
(A) A permanent nameplate shall be attached to the control equipment enclosure or machine and shall be plainly visible after installation. The nameplate shall include the following information ~~that lists~~
(1) ~~s~~Supply voltage, phase, frequency, and full-load current~~;~~
(2) ~~the m~~Maximum ampere rating of the short-circuit and ground-fault protective device,
(3) ~~a~~ Ampere rating of largest motor or load
(4) ~~short-circuit interrupting rating of the machine overcurrent protective device, if furnished.~~ Short Circuit Current Rating of the machine industrial control panel based on one of the following:
(a) Short Circuit Current Rating of a listed and labeled machine control enclosure or assembly
(b) Short Circuit current rating established utilizing an approved method
FPN: UL 508A-2001 Supplement SB is an example of an approved method
(5) ~~and~~ Electrical diagram number(s) or the number of the index to the electrical drawings ~~shall be attached to the control equipment enclosure or machine where plainly visible after installation.~~
The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked "full-load current." Where more than one incoming supply circuit is to be provided,the nameplate shall state the above information for each circuit.

Substantiation:

Reorganize 670.3(A) first paragraph into numbered list to increase usability. The existing requirements for marking of the machine overcurrent protective device interrupting rating was removed. Confusion over this existing marking representing a rating for the entire assembly often occurs and is misleading. New short circuit marking requirements were added to now require an assembly short circuit current rating. With the issuance of UL508A the assembly short circuit current rating for industrial control panels including those on industrial machines, can now be determined. Two options were provided for establishment of this short circuit current rating:
(1) Machine control enclosures which are listed and labeled provided with a short circuit current rating established during the listing [Part 4(a)]
(2) Machines control enclosures which are not listed are required to provide a short circuit current rating established using an approved method.
A Fine Print Note was added to provide users an example of a method, UL508A Supplement SB, that could be used to determine the short circuit current rating. The diagram number marking was revised to match the requirement contained in 17.4.1(7) of NFPA 79-2002.

Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative:
BURKE: Modify the Panel Statement wording to "Accept. The Panel notes that this Proposal was the work of a Task Group from the Technical Committee of Electrical Requirements for Industrial Machines, NFPA 79." This clarification is important because there were several conflicting proposals to make similar revisions to this Section and the Panel accepted this proposal based a large part on the fact that it was the work of a multi-interest Task Group (which included some CMP 12 members). A similar statement was included with several other proposals generated by this Task Group but was left off this one.

12-81 Log #3046 NEC-P12 **Final Action: Accept**
(670-3(A) and 670.4 (A))

Submitter: Todd F. Lottmann Washington, MO

Recommendation:

Add the following FPN to Sections 670.3(A), second paragraph and 670.4(A).
FPN: See 430.22(E) and 430.26 for duty cycle requirements.

Substantiation:

This will provide guidance to the duty cycle requirements contained in these sections.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

12-83 Log #3048 NEC-P12 **Final Action: Accept**
(670-4(B))

Submitter: Todd F. Lottmann Washington, MO

Recommendation:

Revise 670.4(B) and create new 670.4(C) titled Overcurrent Protection. Revise first paragraph of new 670.4(c) with additional wording.

(B) ~~Overcurrent Protection.~~ Disconnecting Means. A machine shall be considered as an individual unit and therefore shall be provided with ~~a~~ disconnecting means. The disconnecting means shall be permitted to be supplied by branch circuits protected by either fuses or circuit breakers. The disconnecting means shall not be required to incorporate overcurrent protection.

(C) Overcurrent Protection. Where furnished as part of the machine, overcurrent protection for each supply circuit shall consist of a single circuit breaker or set of fuses, the machine shall bear the marking required in 670.3 and the supply conductors shall be considered either as feeders or taps as covered by 240.21.

The rating or setting of the overcurrent protective device for the circuit supplying the machine shall not be greater than the sum of the largest rating or setting of the branch-circuit short-circuit and ground-fault protective device provided with the machine, plus 125 percent of the full-load current rating of all resistance heating loads, plus the sum of the full-load currents of all other motors and apparatus that could be in operation at the same time.

Retain existing exception and last paragraph.

Substantiation:

This proposal is the work of a Task Group from Technical Committee of Electrical Requirements for Industrial Machines, NFPA 79. The Task Group consisted of the following members of CMP 12 and NFPA 79.

Paul Dobrowsky, NFPA 79 and CMP 5; Jim Carroll, NFPA 79 and CMP 9; Tom Garvey, NFPA 79 and CMP 11; Lynn Saunders, NFPA 79 and CMP 11; Jim Pierece NFPA 79 and CMP 18; Wayman Withrow, NFPA 79, Dave Quave, CMP 12; Scott Cline, CMP 12, and Andy Cartal.

The Task Group believes that usability of this section can be enhanced by these changes for the following reasons. The paragraph is entitled (B) Overcurrent protection. The very first sentence is discussing a disconnecting means and when and where it is to be provided. There are two different topics in this paragraph. In addition, the Task Group believes that, the title of the section did not correlate with all the requirements contained within. The Task Group believes that usability will be increased if the existing text is separated into two paragraphs one titled Disconnecting Means and one titled Overcurrent Protection. In addition the Task group added the words "for each supply circuit" with the intent to align with requirements in NFPA 79-2002 for multiple source of supply to a machine and provide clarity that these requirements apply to each source of supply.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-85 Log #3261 NEC-P12 **Final Action: Accept in Principle**
(670-5)

Submitter: Gary J. Locke, Lockheed Martin Systems Integration

Recommendation:

Delete the following:

~~670.5 Clearance. Where the conditions of maintenance and supervision ensure that only qualified persons will service the installation, the dimensions of the working space in the direction of access to live parts operating at not over 150 volts line to line or line to ground that are likely to require examination, adjustment, servicing, or maintenance while energized shall be a minimum of 2 1/2 ft (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable.~~

~~Exception: Where the enclosure requires a tool to open, and where only diagnostic and troubleshooting testing is involved on live parts, the clearances shall be permitted to be less than 2 1/2 ft (762 mm).~~

Substantiation:

The purpose of this proposal is to remove text that is redundant with that of NFPA 79, Electrical Standard for Industrial Machinery 2002 Edition Section 12.5.1.1 Exception No. 5 and Exception No. 6 (reference NFPA 79 ROP 79-32 Log #96). The NFPA 79 Technical Committee on Electrical Equipment of Industrial Machinery has addressed the working space requirements of industrial machinery extensively thereby making the provisions of NFPA 70 670.5 redundant and therefore no longer required.

Panel Meeting Action: Accept in Principle

Panel Statement:

See Panel Action on Proposal 12-84. The panel does agree with the removal of the wording. However, Code-Making Panel 12 has jurisdiction over the installation of industrial machinery.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-86 Log #3309 NEC-P12 **Final Action: Reject**
(670-5)

Submitter: Nicholas T. Abbatiello Spencerport, NY

Recommendation:

Add to the end of sentence:
and projections of associated equipment shall not extend more than 150 mm (6 in.) in front of the electrical equipment.
Add to the end of the exception:
and projections of associated equipment in front of and in the vertical space of the equipment shall be permitted to be greater than 150 mm (6 in.)

Substantiation:

The current requirement in 670.5 covers the depth requirement (clearance) for clear working space but not the height requirement; although it does cover opening of doors to 90 degrees, which is already in 110.26. This addition will also cover the height requirement while providing relief for access to enclosures in the exception and make the 670.5 requirement more consistent. The way it reads now, the 6 inch front projection can still be interpreted to apply.

Panel Meeting Action: Reject

Panel Statement:

See Panel Action on Proposal 12-84.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-87 Log #3467 NEC-P12 **Final Action: Accept in Principle**
(670-5)

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

Recommendation:

Delete the section in its entirety.

Substantiation:

The National Electrical Code is prescriptive code. To say "where the conditions of maintenance and supervision ensure that only qualified persons service the installation," is a performance requirement. Without prescriptive requirements indicating whether this qualified person is an employee of the owner of the premises or is a separately contracted person and the Authority Having Jurisdiction has a means of verification of the continued employment of the qualified person and whether the qualified person has been verified by the authority having jurisdiction as meeting the definition of a qualified person as shown in the definitions of this Code no prescriptive requirements have been followed.

To permit relaxation of the safety requirements of this Code without establishing a positive guarantee that the safety of persons and property is indisputably assured is a reprehensible act.

Panel Meeting Action: Accept in Principle

Panel Statement:

See Panel Action on Proposal 12-84.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-84 Log #3049 NEC-P12 **Final Action: Accept**
(670-5 and 670.1)

TCC Action:

The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Accepts" the Panel Action with the understanding that the FPN that was accepted to be added to 670.1 will replace the existing FPN and will not be an additional FPN.

Submitter: Todd F. Lottmann Washington, MO

Recommendation:

Delete existing Section 670.5 and add new Fine Print Note No. 2 to 670.1:

~~670.5 Clearance. Where the conditions of maintenance and supervision ensure that only qualified persons service the installation, the dimensions of the working space in the direction of access to live parts operating at not over 150 volts line to line or line to ground that are likely to require examination, adjustment, servicing, or maintenance while energized shall be a minimum of 750 mm (2 1/2 ft). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable.~~

~~Exception: Where the enclosure requires a tool to open, and where only diagnostic and troubleshooting testing is involved on live parts, the clearances shall be permitted t be less than 750 mm (2 1/2 ft)~~

670.1 Scope.

FPN No. 2: For information on the workspace requirements for equipment containing supply conductor terminals, see 110.26. For information on the workspace requirements for machine power and control equipment, see NFPA 79-2002, Electrical Standard for Industrial Machinery.

Substantiation:

This proposal is the work of a Task Group from Technical Committee of Electrical Requirements for Industrial Machines, NFPA 79. The Task Group consisted of the following members of CMP 12 and NFPA 79.

Paul Dobrowsky, NFPA 79 and CMP 5; Jim Carroll, NFPA 79 and CMP 9; Tom Garvey, NFPA 79 and CMP 11; Lynn Saunders, NFPA 79 and CMP 11; Jim Pierce NFPA 79 and CMP 18; Wayman Withrow, NFPA 79; David Quave, CMP 12; Scott Cline, CMP 12 and Andy Cartal. This additional text is proposed by the Task Group with the intent that this change will let 110.26 dictate the workspace for equipment that falls under the scope of the NEC and let NFPA 79 set the requirements (and the exceptions) for the equipment falling under the scope of NFPA 79. The Task group believes that the scope of Article 670 did not include workspace requirements. The workspace requirements in 670.5 are different than those in 110.26. The Task Group believes that the intent for the addition of Section 670.5 was to allow different spacings than those of 110.26 due to nuance of machinery. In addition, this section was added because at the time NFPA 79 did not contain workspace requirements. The 2002 edition of NFPA 79 now contains these requirements for equipment within its scope of which 670.5 originally targeted. The Task Group believes that the addition of a second Fine Print Note to 670.1 will clarify the appropriate workspace requirements and guide the user to the appropriate standard.

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

12-88 Log #3311 NEC-P12 **Final Action: Reject**
(670-5 Exception)

Submitter: Nicholas T. Abbatiello Spencerport, NY

Recommendation:

Revise as follows:

Where the enclosure (1) requires a tool to open or (2) has interlocked covers, doors, etc. or parts that do not become exposed regardless of the voltage level, and (3) where only diagnostic and troubleshooting is involved on live parts, the clearances shall be permitted to be less than 750 mm (2-1/2 ft).

Substantiation:

Many new constructed industrial control panels are interlocked. In fact, NFPA 79 Clause 7.8 requires interlocked covers on panels unless the motor load is below 2 HP. Clause 7.9 further covers interlocking. Additionally, the industrial control panel components manufacturers are now constructing them to meet IEC requirements for Ingress Protection of at least 1P1X, which meet the requirement for not likely to be inadvertently contacted. The interlocking is independent of voltage level and the recessed component's recessing is designed for its rated voltage.

The dependence on clearance distance, with this form of construction, to protect against the risk of inadvertent contact is unnecessary and should then be placed in the exception or the main rule be rewritten to accept it. If interlocks must be muted for live diagnostics, special procedures are required such as the use of Personal Protective Devices described in NFPA 70E.

Panel Meeting Action: Reject
Panel Statement:
See Panel Action on Proposal 12-84.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

19-155b Log #CP1917 NEC-P19 **Final Action: Accept**
(675.4(B))

Submitter: Code-Making Panel 19

Recommendation:

Revise text as follows: (B) Alternate Wiring Methods. Installation of other listed cables complying with the construction requirements of 675.4(A) shall be permitted.

Substantiation:

Based on the Usability Task Group's request to review all occurrences of the phrase "listed for the purpose" to ensure that it provides clear direction, the panel concludes the revised language clarifies its use in this section.

Panel Meeting Action: Accept

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

Comment on Affirmative:

LAROCCA: Neither the original wording, nor the panel's action sufficiently address the intended purpose of irrigation cable. The change to "other listed cable complying with the construction requirements of 675.4(A)" is not easily enforceable in the field.

Also, listed irrigation cable is evaluated for suitability for exposure to chemical fertilizers, insecticides and other chemicals likely to be introduced into the irrigation equipment. This is not clearly addressed in the current wording or the wording resulting from the panel action.

This section should be reviewed during the comment stage and 675.4(B) rewritten to require listed irrigation cable for all wiring in these machines.

19-156 Log #658 NEC-P19 **Final Action: Reject**
(675-8(A) Exception (New))

TCC Action:

The Technical Correlating Committee directs the panel to reconsider the proposal and correlate the requirement with the requirements for controllers in 430.83. This action will be considered by the Panel as a Public Comment.

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Add new text to read as follows:
Exception: A listed molded case switch shall not require a horsepower rating.

Substantiation:

Listed molded case switches are tested for interrupting capacity at six times ampere rating. They are permitted as motor controllers by 430.83(A)(3) including intermittent duty motors. This section apparently does not disallow them where the machine is not judged as intermittent duty. The continuous current rating required by 675(A)(1) and interrupting capacity at least six times rating would seem to be as safe as an enclosed ampere and HP rated switch, which is apparently not prohibited as a controller.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided insufficient technical substantiation to not require the irrigation controller to have a HP rating.

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

19-157 Log #664 NEC-P19 **Final Action: Accept**
(675-8(B) Exception No. 2 (New))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Add new text to read as follows:
Exception No. 2: A listed fusible molded case switch without marked horsepower ratings shall be permitted.

Substantiation:

Listed fusible molded case switches are tested for interrupting capacity at six times motor full load. They are permitted as motor disconnects by 430.109(A)(3). The continuous current rating required by 675(A)(1) and interrupting capacity at least six times that rating would seem to be as safe as an enclosed ampere and horsepower rated switch, which is permitted.

Panel Meeting Action: Accept

Number Eligible to Vote: 8

Ballot Results: Affirmative: 8

19-158 Log #3499 NEC-P19 (675-13) **Final Action: Reject**

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:

675.13 Methods of Grounding. Machines that require grounding shall have a non–current-carrying equipment ~~grounding~~ bonding conductor provided as an integral part of each cord, cable, or raceway. This ~~grounding~~ bonding conductor shall be sized not less than the largest supply conductor in each cord, cable, or raceway. Feeder circuits supplying power to irrigation machines shall have an equipment ~~grounding~~ bonding conductor sized according to Table 250.122.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

Bonding is defined in the NEC as the permanent joining together of metallic parts to form a conductive path. Grounding is defined in the NEC as the connection of the bonded parts to earth. The proposed change to rename this conductor does not clarify the confusion indicated by the submitter.

Number Eligible to Vote: 8

Ballot Results: Affirmative: 6 Negative: 2

Explanation of Negative:

SABIN-MERCADO: "Grounded" and "grounding" sound similar but are intended to describe two totally different concepts. However, these terms are often used interchangeably by users of the NEC. In fact, there are places in the NEC where these terms are used interchangeably. The words ground, grounded and grounding will apply to the concept of connecting an electrical system to the earth. While the words bond, bonded and bonding will apply to the concept of connecting together noncurrent carrying conductive parts likely to become energized so that they form an effective ground fault path back to the source. If the terms are not similar, the concepts can be more easily differentiated by the users. I think this change will greatly improve usability and understanding of the NEC. This issue needs to be brought forth through the Technical Correlating Committee.

ZANICCHI: The term "bonding" is technically correct for this conductors application. This conductor is there to "bond" equipment to the "system grounded conductor, the grounding electrode conductor or both" at the service equipment as stated in Article 100. The use of the term "bonding" instead of "grounding" does not change the function of the conductor but it will help make the code more understandable. An example: A journeyman says to their apprentice "That 3 phase 208v mixer needs to be grounded". The apprentice asks themselves "does the journeyman mean that this mixer needs a grounded conductor brought to it? If we used the term "bonded" instead of "grounded" the journeyman would have said "That 3 phase 208v mixer needs to be bonded". Clearly, the separation of the terms grounded and bonded makes the journeyman's statement easier to understand. I hope that other panels consider making this change, especially Panel 5 which deals with Article 250, and that we "Accept in Principal" the change as I believe it will make a difference in the usability of the code.

17-55 Log #3413 NEC-P17 **Final Action: Reject**
(680.xx (New))

Submitter: Richard D. Thompson, Thompson Associates

Recommendation:

Add a new section:
680.xx Corrosion Resistant Wiring Devices and Equipment. All electrical devices and conduit where exposed to a corrosive atmosphere shall be listed for corrosion resistance, and shall meet the requirements of 300.6, 310.9, 314.15(A) FPN No. 2, 344.10(B), 352.10(B), 358.10(B), 362.10(3), 410.4(B).

Substantiation:

All swimming pools, fountains and similar installations use chlorine or bromine for sanitation and acids for the control of Ph. Such chemicals are highly corrosive, and can expose the electrical equipment housed in an enclosed pump room to the corrosive effects of these chemicals. Often in the use of these chemicals, there are spills, containers left open or leaking. Such situations will create within the enclosed space of a pump room, a corrosive atmosphere that will affect all metal objects including wiring devices, motors, time clocks, lighting fixtures, conduit, and wire.

The Fine Print Note No. 2 in 314.15 does state that electrical devices are to be protected from corrosion and references back to 300.6. Again, 300.6 a fine print note under (C) Indoor Wet Locations,r references swimming pool areas. However, neither of these FPNs are mandatory. An inspection of virtually any commercial swimming pool or fountain pump room will show serious signs of corrosion. It is the nature of the installation and its environment.

I have personally experienced such a situation in my own private (home) pool installation. I have an automatic chlorinator on which an O-ring seal failed. Until the failure were discovered, the pool's pump room was sprayed with concentrated chlorinated water. Several months later it was discovered that the GFCI receptacle protecting the electrical installation and the light switch within the room had both failed. Examination showed severe corrosion on the terminations and contacts.

By requiring the use of corrosion resistant wiring devices in this type of installation will prevent such electrical failures and maintain a safe installation. I have recently noted that at least one manufacturer of GFCI devices is now meeting UL's requirements for corrosion resistance.

Panel Meeting Action: Reject

Panel Statement:

Article 110 and more specifically 110.11 provide requirements and guidance for electrical installations in corrosive atmospheres. There is no reason to modify or provide redundancy for the provisions of Chapter 1 through 4.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-56 Log #2669 NEC-P17 **Final Action: Reject**
(680-2–Body of Water)

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.2 by moving the definition of the term "Body of Water" from 680.1 Scope to 680.2 Definitions as follows:
Body of Water: The term "body of water" includes all bodies of water included in these definitions.

Substantiation:

It does not seem the definition of "Body of Water" is appropriate for the scope of Article 680. It seems more appropriate to have the term in Section 680.2 with the other definitions that apply to Article 680.

Panel Meeting Action: Reject

Panel Statement:

The term body of water in 680.1 Scope, does not include a definition. It is included in the the scope to tie the term as used in the body of the code to the scope. It is properly located and used.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-57 Log #3247 NEC-P17 **Final Action: Reject**
(680-4(A) (New))

Submitter: Alfred A. Fiorello, Fiorello Electric Inc.

Recommendation:

Add a new 680.4(A) to read as follows:
(A) Warning signs to notify users of pacemaker, and defibrillators, that 3 milivolts of stray voltages in the community or public pools may cause their device to fail.

Substantiation:

At a swimming pool in Marlboro Township, New Jersey, a person swimming in the pool, at 2 different times had his defibulator stop. The manufacturer of these devices warned that very small minivolt would stop these units. More documentation is available.

Panel Meeting Action: Reject

Panel Statement:

If the pool or spa is installed in accordance with the National Electrical Code, there would not be a stray voltage to cause this damage.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-58 Log #550 NEC-P17 **Final Action: Reject**
(680-5(B) (New))

Submitter: Glenn W. Zieseniss Crown Point, IN

Recommendation:

Make existing text 680.5(A) and add the following new text as 680.5(B).
(B) Wiring. Conductors on the load side of a ground-fault-circuit-interrupter shall not occupy raceways, boxes, or enclosures containing other conductors unless the other conductors are protected by ground-fault-circuit-interrupters or are grounding conductors. Supply conductors to a feed-through type ground-fault-circuit-interrupter shall be permitted in the same enclosure. Ground-fault-circuit-interrupters shall be permitted in a panelboard that contains circuits protected by other than ground-fault-circuit-interrupters.

Substantiation:

This text, in general, was carried over from the 1999 NEC to 680.23(F)(3). 680.23 is under a heading of "Underwater Luminaries (lighting Fixtures)." The original (NEC 1999) was for all outlets about a swimming pool, where typically persons are barefoot, thus increasing hazards. The requirements of 680(F)(3) should apply to all GFCI circuits about a swimming pool, not just underwater luminaries.
This is a safety issue.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not supplied any technical substantiation to warrant this change. Furthermore, the 1999 NEC did require this for only underwater luminaires in Section 680-5(c).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-59 Log #1774 NEC-P17 **Final Action: Reject**
(680-7, 680.6)

Submitter: John Weber, Electrical Service Specialist Inc.

Recommendation:

Need cord length to reach receptacle.

Substantiation:

There is a need that 680-7 and 680-6, come together if I have a pump in a water feature (pond). The 3 ft cord will not reach the receptacle if it is 5 ft from the edge of the pond.

Panel Meeting Action: Reject

Panel Statement:

In Section 680.51(E), it already states the limit is 10 ft. The cords that extend over 10 ft shall be installed in an approved wiring enclosure. This Article does not apply to ponds.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-60 Log #1986 NEC-P17 **Final Action: Reject**
(680-7(B))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(B) Equipment Grounding. The flexible cord shall have a copper equipment ~~grounding~~ bonding conductor sized in accordance with 250.122 but not smaller than 12 AWG. The cord shall terminate in a grounding-type attachment plug.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-61 Log #1584 NEC-P17 **Final Action: Accept**
(680-8)

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

Revise Section 680.8 as follows:
680.8 Overhead Conductor Clearances.
General. The minimum clearances required by this section shall be taken from the maximum water level of the specified body of water.
(A) Power. With respect to service drop conductors and open overhead wiring, swimming pool and similar installations shall comply with the minimum clearances given in Table 680.8 and illustrated in Figure 680.8.
FPN: Open overhead wiring as used in this article typically refers to conductor(s) not in an enclosed raceway.

Substantiation:

A new definition was added to the 2002 NEC to provide clarification for the height requirements for the deck boxes as covered in 680.24. This revision would clarify the requirement for 680.8 which requires a minimum clearance from the water level. The change is directed toward providing consistency in this section.

Panel Meeting Action: Accept

Editorially delete "General" as a heading of the first paragraph.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-62 Log #41 NEC-P17 **Final Action: Accept**
(680-9 Exception (New))

NOTE: The following proposal consists of Comment 20-19 on Proposal 20-29 in the 2001 May Meeting National Electrical Code Committee Report on Proposals. This comment was held for further study during the processing of the 2002 NATIONAL ELECTRICAL CODE. The recommendation in Proposal 20-29 was:

[Text of (May 2001) Proposal 20-29 is shown on page 2660]

Submitter: Thomas L. Harman, Univ. of Houston Clear Lake

Recommendation:

Added text:
Exception: Listed instantaneous electric water heaters shall have their loads subdivided as defined in Article 422.
Panel 20 accepted Proposal 20-6 for Article 422-11 and allowed "listed instantaneous electric water heaters" to have their heating elements subdivided into circuits not exceeding 120 amperes and protected at not more than 150 amperes. This exception should also apply to electric pool water heaters.

Substantiation:

Due to the technological advances in tankless (instantaneous) water heater design, I believe that Section 680-9 should not apply as presently written to water heaters that are protected within their rating. If an instantaneous water heater is a listed (UL) product that has been field tested with a variety of supply circuits, there is no technical or safety reason to limit the branch circuit protection to 60 amperes or cause the loads to be subdivided to 48 amperes.
This requirement for water heaters was introduced in the 1975 code with the justification that heaters with "small internal conductors" might be protected by unspecified sizes of overcurrent devices.
The restrictions on overcurrent protection of water heaters in the present code are unnecessarily restrictive for the new types of instantaneous water heaters. No technical justification has been given to limit the loads to 48 amperes. Field experience and testing has indicated that the design and control of today's instantaneous water heaters allows for their safe installation as described in the proposal (20-6) accepted for Article 422-11.
For example, an instantaneous water heater with four elements drawing a maximum of 25 amperes each would require four 30-ampere branch circuits by the present wording of the NEC. A safer alternative would be to subdivide the loads using two elements each on a 60-ampere circuit as allowed by the exception that will be incorporated in Article 422-1. Then, only two circuit breakers need be turned off to disconnect the unit. Since the heater must be a listed appliance, the internal wiring would be sufficient for the 60-ampere circuits.

Panel Meeting Action: Accept
Editorially correct "Article 422" to Section "422.11(F)(3)" in the recommendation.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-63 Log #3343 NEC-P17 **Final Action: Accept**
(680-9 Exception (New))

Submitter: Thomas L. Harman, Univ. of Houston Clear Lake

Recommendation:

Add new text to read as follows:
Exception: Listed instantaneous electric water heaters shall have their loads subdivided as defined in Article 422.

Substantiation:

Due to the technological advances in tankless (instantaneous) water heater design, I believe that 680.9 should not apply as presently written to instantaneous electric water-heaters used for space heating applications as long as the heaters are protected within their rating. If an instantaneous water heater is a listed (UL) product that has been field tested with a variety of supply circuits, there is no technical or safety reason to limit the branch circuit protection to 60 amperes or cause the loads to be subdivided to 48 amperes.
This requirement for water heaters was introduced in the 1975 code with the justification that heaters with "small internal conductors" might be protected by unspecified sizes of overcurrent devices.
The restrictions on overcurrent protection of water heaters in the present code are unnecessarily restrictive for the new types of instantaneous water heaters. No technical justification has been given to limit the loads to 48 amperes. Field experience and testing has indicated that the design and control of today's instantaneous water heaters allows for their safe installation as described in 422-11(F)(3).
For example, an instantaneous water heater with four elements drawing a maximum of 25 amperes each would require four 30-ampere branch circuits by the present wording of the NEC. A safer alternative would be to subdivide the loads using two elements each on a 60-ampere circuit as allowed by 422-11. Then, only two circuit breakers need be turned off to disconnect the unit. Since the heater must be a listed appliance, the internal wiring would be sufficient for the 60-ampere circuits.

Panel Meeting Action: Accept
Editorially correct "Article 422" to Section "422.11(F)(3)" in the recommendation.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-64 Log #2508 NEC-P17 **Final Action: Accept**
(680-10)

Submitter: George W. Flach, Nat'l Armored Cable Mfrs' Assn. (NACMA)

Recommendation:

Revise 680.10 to permit jacketed type MC that is listed for direct burial as follows:
680.10 Underground Wiring Location. Underground wiring shall not be permitted under the pool or within the area extending 1.5 m (5 ft) horizontally from the inside wall of the pool unless this wiring is necessary to supply pool equipment permitted by this article. Where space limitations prevent wiring from being routed a distance of 1.5 M (5 ft) or more from the pool, such wiring shall be permitted where installed in rigid metal conduit, intermediate metal conduit, jacketed type MC cable that is listed for direct burial, or a nonmetallic raceway system. All metal conduit shall be corrosion resistant and suitable for the location. The minimum burial depth shall be given in Table 680.10

****Insert Tbl 680.10 Minimum Burial Depths Here****

(Table shown on page 2783)

Substantiation:

Jacketed Type MC cable that is listed for direct burial is suitable for underground installations including those within 5 ft of a swimming pool. The burial depth that is proposed is taken from Table 300.5 as are the wiring methods and burial depths presently covered in Table 680.10. Jacketed Type MC cable that is listed for direct burial has both an outer jacket and a metallic armor that provides suitable mechanical protection for the cable in the proposed application.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-65 Log #3051 NEC-P17 **Final Action: Reject**
(680-10)

Submitter: Richard M. Conner, M. Davis & Son

Recommendation:

Eliminated all metal conduit used on pools. Lower risk.

Substantiation:

Make all conduit used on pools PVC. SC.80.

Panel Meeting Action: Reject

Panel Statement:

The submitter did not provide evidence to indicate metal conduit is unsafe.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-66 Log #3053 NEC-P17 **Final Action: Reject**
(680-10)

Submitter: Robert Dowd, Zale Electric Inc.

Recommendation:

Eliminate all metal conduit.

Substantiation:

Make all PVC Schedule 80.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-65.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-67 Log #3525 NEC-P17 (680-10) **Final Action: Reject**

Submitter: Bryan Demariz, Triton

Recommendation:

Get rid of all metal conduit.

Substantiation:

Make all PUC be used!

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-65.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-68 Log #54 NEC-P17 (680-12) **Final Action: Reject**

NOTE: The following proposal consists of Comment 20-22 on Proposal 20-62a in the 2001 May Meeting National Electrical Code Committee Report on Proposals. This comment was held for further study during the processing of the 2002 NATIONAL ELECTRICAL CODE. The recommendation in Proposal 20-62a was:

Revise 680-12 to read:

"Maintenance Disconnecting Means. One or more disconnecting means from all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be accessible and within sight from its equipment."

Comment 20-22 received the following Technical Correlating Committee Note:

It was the action of the Technical Correlating Committee that this comment be reported as "Hold" because the panel states that the comment introduces new material that has not had public review.

Submitter: Art Cummins, City of Decatur

Recommendation:

Add new text:

Safety Disconnecting Means. One or more disconnecting means from all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be accessible and within sight from persons using the pool, spa or hot tubs, and shall be at least 5 ft from nearest edge of water.

Substantiation:

The original proposal (20-75) for the 1996 code was intended to be used for the safety of people using the various utilization equipment. The disconnecting means for motors - pumps are already covered in Article 430 and water heating equipment is covered in Article 422. The IAEI Analysis of the 1999 NEC also states the case for emergency use for the disconnects.

Panel Meeting Action: Reject

Panel Statement:

No evidence has been provided to indicate emergency switches are needed for safety at a pool. See 680.41 for requirements for emergency switch for spas and hot tubs.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-69 Log #1434 NEC-P17 (680-12) **Final Action: Reject**

Submitter: Patrick Weldon Apple Valley, MN

Recommendation:

Revise text to read as follows:

680.12 Maintenance Disconnecting Means. One or more means to disconnect all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be accessible and within sight from its equipment. Disconnecting means shall be located at least 1.52 m (5 ft) from the inside walls of the pool, spa, or hot tub.

Substantiation:

The requirement that these disconnects be located a minimum of 1.52 m (5 ft) was not included in the change made to 680.12 for the 2002 cycle. This type of electrical equipment located within this distance is a potential safety hazard.

Panel Meeting Action: Reject

Panel Statement:

It is already required by 680.22(C).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-70 Log #1436 NEC-P17 **Final Action: Reject**
(680-12)

Submitter: Patrick Weldon Apple Valley, MN

Recommendation:

Revise text to read as follows:
680.12 Maintenance Disconnecting Means. One or more means to disconnect all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be accessible and within sight from its equipment. Disconnecting means shall be located at least 1.52 m (5 ft) from the inside walls of the pool, spa, or hot tub unless separated by a permanent barrier.

Substantiation:

The requirement that these disconnects be located a minimum of 1.52 m (5 ft) was not included in the change made to 680.12 for the 2002 cycle. This type of electrical equipment located within this distance is a potential safety hazard. By permitting a permanent barrier would allow the disconnect for hot tub equipment and such to be installed under the skirt of the equipment.

Panel Meeting Action: Reject

Panel Statement:

It is already required in Section 680.22(C).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-71 Log #2670 NEC-P17 **Final Action: Accept**
(680-12)

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.12 as follows:
680.12 Maintenance Disconnecting Means.
A ~~One or more~~ means to disconnect all ungrounded conductors shall be provided for all utilization equipment other than lighting. The disconnecting ~~Each~~ means shall be readily accessible and within sight from its equipment.

Substantiation:

There does not seem to be a reason to have the section refer to more than one disconnecting means. One disconnecting means within sight should provide the safety needed.
Also, the disconnecting means should be "readily accessible," as defined in Article 100 not just "accessible." An "accessible" disconnecting means could be located at a height where a portable ladder or other means would be needed to access the disconnect for the equipment. This does not seem safe or needed from an operational standpoint.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-72 Log #3500 NEC-P17 **Final Action: Reject**
(680-21(A))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
680.21 Motors.
(A) Wiring Methods.
(1) General. The branch circuits for pool-associated motors shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or Type MC cable listed for the location. Other wiring methods and materials shall be permitted in specific locations or applications as covered in this section. Any wiring method employed shall contain a copper equipment ~~grounding~~ bonding conductor sized in accordance with 250.122 but not smaller than 12 AWG.
(2) On or Within Buildings. Where installed on or within buildings, electrical metallic tubing shall be permitted.
(3) Flexible Connections. Where necessary to employ flexible connections at or adjacent to the motor, liquidtight flexible metal or nonmetallic conduit with approved fittings shall be permitted.
(4) One-Family Dwellings. In the interior of one-family dwellings, or in the interior of accessory buildings associated with a one-family dwelling, any of the wiring methods recognized in Chapter 3 of this Code shall be permitted that comply with the provisions of this paragraph. Where run in a raceway, the equipment ~~grounding~~ bonding conductor shall be insulated. Where run in a cable assembly, the equipment ~~grounding~~ bonding conductor shall be permitted to be uninsulated, but it shall be enclosed within the outer sheath of the cable assembly.
(5) Cord-and-Plug Connections. Pool-associated motors shall be permitted to employ cord-and-plug connections. The flexible cord shall not exceed 900 mm (3 ft) in length. The flexible cord shall include an equipment ~~grounding~~ bonding conductor sized in accordance with 250.122 and shall terminate in a grounding-type attachment plug.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-73 Log #2298 NEC-P17 **Final Action: Accept**
(680-21(A)(1))

Submitter: Timothy D. Curry, Curry Electric, Inc.

Recommendation:

Revise text as follows:
680.21(A)(1) General. The branch...covered in this section. Any wiring method employed shall contain an insulated copper equipment grounding conductor...12 AWG.

Substantiation:

680.21(A)(4) requires an insulated grounding conductor when raceway is installed inside a one family dwelling. 680.21(A)(1), (2), & (3) simply require a grounding conductor to be run in the raceway, but do not specify that the conductor should be insulated. Logic would seem to indicate that if a conductor has to be insulated when installed in raceways in a low risk area like a one-family dwelling (low risk - as shown by the allowance of cable assemblies) certainly we should require an insulated grounding conductor in all conduits installed in other (higher risk) areas.
See also a companion proposal to omit the need for an insulated grounding conductor in raceways in one-family dwellings.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-74 Log #3516 NEC-P17 **Final Action: Accept**
(680-21(A)(1))

Submitter: Robert H. Keis Dover, DE

Recommendation:

The last sentence of (A)(1) should read:
Any wiring method employed shall contain an insulated copper equipment grounding conductor sized in accordance with 250.122 but not smaller than 12 AWG.

Substantiation:

The argument has been raised that since this section does not require an "insulated" equipment grounding conductor, that a bare conductor could be used. In "(4) One-Family Dwellings" there is a requirement for an insulated equipment grounding conductor where the circuit is installed in raceway, but not in the (A)(1) General section. The rule is the same for all installations and should read the same. The last sentence in (A)(4) allows a cable assembly and is not a problem.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-75 Log #2297 NEC-P17 **Final Action: Accept**
(680-21(A)(4))

Submitter: Timothy D. Curry, Curry Electric, Inc.

Recommendation:

Delete text as follows:
680.21 (A)(4) In the interior of one-family dwellings, or in the interior of accessory buildings associated with a one-family dwelling, any of the wiring methods recognized in Chapter 3 of this Code shall be permitted that comply with the provisions of this paragraph. ~~Where run in raceway, the equipment grounding conductor shall be insulated.~~ Where run in a cable . . .

Substantiation:

680.21(A)(4) requires an insulated grounding conductor when raceway is installed inside a one family dwelling. 680.21 (A)(1), (2), & (3) simply require a grounding conductor to be run in the raceway, but do not specify that the conductor should be insulated. Logic would seem to indicate that if a conductor does not have to be insulated when installed in raceways in other locations, a low risk area like a one-family dwelling (as shown by the allowance of cable assemblies) certainly should not require an insulated grounding conductor.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-76 Log #2750 NEC-P17 **Final Action: Reject**
(680-21(A)(4))

Submitter: Bill Addiss, Electrical Contractor Network

Recommendation:

Add sentence to the end of 680.21(A)(4):
GFCI protection shall be provided for all Pool-associated motors installed at One-Family Dwellings.

Substantiation:

Requiring GFCI protection for all Pool-associated motors installed at, or in, One-Family Dwellings would increase overall safety and discourage the practice of hard-wiring that some may do to avoid the cost of providing GFCI protection. It has been my observation that most hard-wired pump installations located at One-Family dwellings will eventually become hazardous because of disconnection and reconnection by less than qualified persons during servicing or winterizing procedures.

Panel Meeting Action: Reject

Panel Statement:

Submitter has not provided sufficient evidence or documentation to add such a requirement.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

PEARSE: GFCI protection of hard-wired pump motors should be reinstated as in the 1999 NEC.

17-77 Log #2399 NEC-P17 **Final Action: Reject**
(680-21(A)(6))

Submitter: David A. Williams Lansing, MI

Recommendation:

GFCI Protection. Branch circuits supplying pool pump motors rated 15 and 20 amperes, 125 volts to 240 volts, single phase whether by receptacle or direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.

Substantiation:

This code requirement in the 1999 edition of the code and was removed for the 2002. Electricity and swimming pools applications need to be GFCI protected for the safety of everyone involved. The Manufacturer's installation instructions for swimming pool pumps require the GFCI protection for safety. Even though it is required by the installation instructions, many homeowners and electricians do not read this important safety information. GFCI protection for swimming pool pumps needs to be a code requirement in order to ensure safety.

Panel Meeting Action: Reject

Panel Statement:

Submitter has not provided sufficient evidence or documentation to add such a requirement.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

PEARSE: GFCI protection of hard-wired pump motors should be reinstated as in the 1999 NEC.
YASENCHAK: See my Explanation of Negative for 17-80.

17-78 Log #3077 NEC-P17 **Final Action: Accept**
(680-21(B))

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

Recommendation:

Add the following sentence:
Where the bonding grid is connected to the equipment grounding conductor of the motor circuit in accordance with the second paragraph of 680.26(B)(4), the branch circuit wiring shall comply with 680.21(A).

Substantiation:

In general, the wiring rules in Chapter 3 are sufficient for safety of DI pump motors, however, if the local branch-circuit equipment ground is also the local grounding connection for the bonding grid, the integrity of the ground return path is much more critical. In such cases, the normal branch circuit rules for conventional pump motors should apply. In these cases, more than just the appliance is at stake.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-79 Log #1049 NEC-P17 **Final Action: Reject**
(680-21(C))

Submitter: Greg Chontow Hapatcong, NJ

Recommendation:

Add new text to read as follows:
Emergency Switch. A clearly labeled emergency shutoff or control switch for the purpose of stopping the motor(s) that provide power to the recirculation system and jet system shall be installed at a point readily accessible to the users and not less than 1.5 m (5 ft) away. Adjacent to, and within sight of the pool.
Exception: Pools with two or more drains.

Substantiation:

A pool with a single drain can entrap a user via suction created by filter motor. As it is not the intent of the NEC to require its users to understand the pool plumbing. An emergency disconnect switch would eliminate this hazard.
Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement:

The hazard that the submitter is trying to eliminate are already addressed in ANSI/NSPI series of standards for pools.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-80 Log #2546 NEC-P17 (680-22(A)) **Final Action: Reject**

Submitter: Alan Manche, Schneider Electric/Square D

Recommendation:

Revise NEC 680.22(A)(5) with the additions (underlined) and deletions (strike through) as shown. The entire text of 680.22(A)(5) is shown for clarity, but only those changes shown underlined or strike through are part of this proposal.

(5) GFCI Protection. All 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a pool or fountain shall be protected by a ground-fault circuit interrupter. ~~Receptacles that supply p~~ Pool pump motors ~~and~~ that are rated 15 or 20 amperes, 120 volt through 240 volts, single phase, shall be provided with GFCI protection.

Substantiation:

The requirement to protect permanently connected pool motors was inappropriately removed from the 2002 NEC during the reorganization of 680 and must be placed back in the NEC to afford the level of electrical protection provided in the 1999 NEC. The panel reduced the level of protection without any substantiation by stating in the 1998 ROP:

"reworded to only apply to receptacle outlets. The panel reconsidered the concept of providing GFCI protection for all small motors and decided that there was insufficient substantiation to keep the rule for hard wired motors."

The requirements for permanently connected pool pumps motors to be GFCI protected was unanimously introduced by CMP-20 during the ROC – Comment 20-96 -- in the 1999 NEC development cycle. Substantiation was provided during the ROP – Proposal 20-96 – that states "The OSHA report on the fatality in one N.J. municipality alone addressed serious electrical violations of known safety requirements, that if GFCI protected, could have prevented the death of a young lifeguard." The panel rejected the proposal due to limitations on the equipment, such as three phase GFCI, that was not available. CMP-20 then appropriately acted during the Comment stage to protect those permanently connected pool pumps where GFCI equipment was available.

This proposal is simply requesting the panel to reinstate the GFCI protection requirement on permanently connected pool pumps as supported by the substantiation and action taken by the panel in the 1999 NEC development cycle.

Panel Meeting Action: Reject

Panel Statement:

This requirement is for cord and plug connected pumps. There is no substantiation to require hard wired motors to be GFCI protected.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

PEARSE: GFCI protection of hard-wired pump motors should be reinstated as in the 1999 NEC.

YASENCHAK: No justification was given to remove this requirement from the 2002 NEC. The level of protection for the persons and property, which is the purpose of the Code, was reduced due to this action. The original justification (OSHA report) for this protection was ignored by CMP-20. The public that is most likely to come into contact with this equipment is not trained nor have the ability to recognize hazards associated with this equipment.

This is related to only single phase motors, so the argument made that GFCI protection was not available for three phase equipment is null and void.

The requirement for GFCI protection of hard-wired motors, not cord and plug connected, should be reinstalled in the NEC.

17-81 Log #1516 NEC-P17 (680-22(A)(3)) **Final Action: Reject**

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education

Recommendation:

Change title from "Dwelling Unit(s)" to "Dwellings"; on the second line, delete "~~units~~," and insert "unless circumstances ensure continuous professional supervision when the pool is used."

Substantiation:

"Dwelling unit(s)" is no clearer than, and certainly more cumbersome than, "dwellings". Beyond that minor issue, the present wording has confused some people who are unsure of its applicability to apartment complexes. If the rationale is to interfere with small homeowners and tenants electrocuting themselves by running extension cords out windows and doorways, dwelling pools with qualified pool managers and lifeguards can be exempted as plausibly as regular commercial pools.

Panel Meeting Action: Reject

Panel Statement:

The term dwelling unit is defined in Article 100. The substantiation presented does not justify the reduction in safety.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-82 Log #148 NEC-P17 **Final Action: Reject**
(680-22(A)(5))

Submitter: Steve Mancuso, Chester Electric Inc.

Recommendation:

Add new text to read as follows:
(5) GFCI Protection. All 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a pool or fountain shall be protected by a ground-fault circuit interrupter. Receptacles all outlets that supply pool pump motors and that are rated 15 or 20 amperes, 120 volt through 240 volts, single phase, shall be provided with GFCI protection.

Substantiation:

A pool pump motor can be wired directly without GFI protection. It would be safer to provide GFI protection. Revising the wording would accomplish this.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-80.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

YASENCHAK: See my Explanation of Negative for 17-80.

17-83 Log #1413 NEC-P17 **Final Action: Accept in Principle**
(680-22(A)(5))

Submitter: Angelo Sperlongo, City of Coral Springs

Recommendation:

Revise text to read as follows:
All 125 volt receptacles located within 6.0 m (20 ft) of the inside walls of pool or fountain shall be protected by a ground-fault circuit interrupter. Receptacles that supply pool pump motors and that are rated 15 or 20 amperes, 125 volt through 250 volts, single phase, shall be provided with GFCI protection.

Substantiation:

Receptacles shall be rated not less than 15 amps, 125 volts, or 15 amps, 250 volts, as per NEC 406.2(B). If the 240 volt rating is not changed, the rule would basically not apply to 250 volt receptacles. Also the change to 15 and 20 amp, 125 and 250 volt receptacles would correspond with receptacle ratings in damp or wet locations in Article 406.8(B).

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-85.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-84 Log #2677 NEC-P17 **Final Action: Accept in Principle**
(680-22(A)(5))

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.22(A)(5) as follows:
(5) GFCI Protection. All 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a pool or fountain shall be protected by a ground-fault circuit interrupter. Receptacles that supply pool pump motors and that are rated 15 or 20 amperes, 125 or ~~120 volt through~~ 250 ~~240~~ volts, single phase, shall be provided with GFCI protection.

Substantiation:

This proposal intends to correct the voltage rating of receptacles in this section. Receptacles are rated at 125 or 250 volts while the branch circuit may operate at a nominal voltage of 120 or 240 volts.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-85.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-85 Log #3186 NEC-P17 **Final Action: Accept in Principle**
(680-22(A)(5))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Mass Electrical Code Adv. Committee

Recommendation:

Revise the first sentence to read as follows:
All 15- and 20- ampere, single-phase, 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a pool shall be protected by a ground-fault circuit interrupter.

Substantiation:

This proposal corrects an error in the 2002 NEC in that the fountain language is beyond the scope of Part II of Article 680. It also moderates the requirement by reducing the current threshold to that of the pump motor receptacle. See also the companion proposal to Part V of this article.

Panel Meeting Action: Accept in Principle

In addition, revise the second sentence 680.22(A)(5) to read as follows:
Receptacles that supply pool pump motors and that are rated 15 or 20 amperes, 125 volts through 250 volts, single phase, shall be provided with GFCI protection.

Panel Statement:

The additional revision was made to prevent 125 volt through 250 volt receptacles to be excluded from the GFCI requirement.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-86 Log #1724 NEC-P17 **Final Action: Reject**
(680-22(D))

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

New text to read as follows:
(D) Motors in Other than Dwelling Units. Wiring supplying pool pump motors rated 15 and 20 amperes, 125 volt or 240 volt, single phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.

Substantiation:

This requirement was not included in Article 680 for the 2002 NEC. It appears to have been left out without any substantiation, proposal, or comment to remove it from the requirements of the Code. If this was inadvertently left out, it should be inserted back into the 2005 NEC. The proposed text IN Section 680.22(D) is the same language that existed in 1999 NEC Section 680-6(d).

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 17-80.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

PEARSE: GFCI protection of hard-wired pump motors should be reinstated as in the 1999 NEC.
YASENCHAK: See my Explanation of Negative for 17-80.

17-87 Log #142 NEC-P17 **Final Action: Reject**
(680-23)

Submitter: David Hoyt, Seminole County

Recommendation:

Add new text to read as follows:
Underground wiring to a listed low voltage underwater luminare 15 volts or less shall be a minimum of 12 in. below grade.

Substantiation:

The NEC does not specify a burial depth for a 15 volt or less luminare for a pool. Due to this we have conduits just under sod and damage has occurred. A minimum depth of 12 in. would protect conduit from damage.

Panel Meeting Action: Reject

Panel Statement:

The submitter provided no evidence to indicate a hazard exists. See 680.10 for burial depths.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-87a Log #CP1707 NEC-P17 **Final Action: Accept**
(680-23(A)(2))

Submitter: Code-Making Panel 17

Recommendation:

In Section 680.23(A)(2) change "listed for the purpose" to "listed as a swimming pool and spa transformer."

Substantiation:

This change more accurately reflects the intent of the committee.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-88 Log #2618 NEC-P17 **Final Action: Reject**
(680-23(B)(1))

Submitter: Richard F. Van Wert, Middle Department Inspection Agency

Recommendation:

Revise text to read as follows:
...shall include provisions for terminating an 8 AWG solid copper conductor on the shell exterior, and an 8 AWG solid or stranded insulated copper conductor on the shell interior.

Substantiation:

As written in the 2002 NEC, 680.23 allows room for argument that the only requirement is an 8 AWG conductor. The rewrite makes it clear that insulated vs. bare and solid vs. stranded are important considerations as spelled out in 680.26.

Panel Meeting Action: Reject

Panel Statement:

The code already requires a solid 8 AWG on the exterior of the luminaire and the code already permits a solid or stranded 8 AWG wire on the interior of the luminaire. The requirements for lugs are part of the product listing.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-89 Log #177 NEC-P17 **Final Action: Accept in Part**
(680-23(B)(2))

Submitter: Pete Baldauf, City of Vandalia

Recommendation:

Revise text as follows:
(2) Wiring extending directly to the forming shell conduit shall be installed from the forming shell to a ~~suitable~~ junction box or other enclosure ~~located~~ conforming to the requirements as provided in 680.24.

Substantiation:

In my opinion, a person could misinterpret 680.23(B)(2) in meaning that a standard weather-proof box would be sufficient. Also, it could lead a person to believe that the box would only have to be "located" as provided in 680.24 and that the other provisions of 680.24 would not apply.

Panel Meeting Action: Accept in Part

The panel only accepts the strikethrough and underscore text. The panel does not accept any other changes to the 2002 code text.

Panel Statement:

The panel noted inconsistent language in the proposal from the 2002 code text.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-90 Log #1582 NEC-P17 (680-23(B)(2)) **Final Action: Accept**

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

Revise Section 680.23(B)(2) as follows:

(2) Wiring Extending Directly to the Forming Shell. Conduit shall be installed from the forming shell to a suitable junction box or other enclosure located as provided in 680.24. Conduit shall be rigid metal, intermediate metal, liquidtight flexible nonmetallic, or rigid nonmetallic.

(a) Metal Conduit. Metal conduit shall be approved and shall be of brass or other approved corrosion-resistant metal.

(b) Nonmetallic Conduit. Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper ~~equipment grounding conductor~~ shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The bonding jumper ~~equipment grounding conductor~~ shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG bonding jumper ~~equipment grounding conductor~~ in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from the possible deteriorating effect of pool water.

Substantiation:

The revision as proposed would provide consistency with the use of grounding and bonding terms that parallel those defined terms in other sections of the NEC and Article 100. In these installations there are there components of the grounding and bonding scheme that all provide different roles. The equipment grounding conductor for the equipment (which is the wet niche luminaire (fixture) itself, is included in the cord assembly that is drawn into the nonmetallic raceway to the forming shell. This conductor meets the definition of grounding conductor, equipment in Article 100 and is sized based on the provisions in 680.23(B)(3).

The next component is a 8 AWG solid copper conductor that is a bonding jumper to connect the outside of the forming shell to the common bonding grid in accordance with 680.26(B)(2).

The 8 AWG copper conductor installed in the nonmetallic raceway to the forming shell performs as a bonding jumper to bond the metal shell to the junction box for the wet niche luminaire (fixture).

It appears that the appropriate term for the conductor in the raceway between the forming shell and the deck box would be "bonding jumper" and would be consistent with that defined term in Article 100.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-91 Log #1988 NEC-P17 **Final Action: Accept in Principle in Part**
(680-23(B)(2)(3))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(2) Wiring Extending Directly to the Forming Shell. Conduit shall be installed from the forming shell to a suitable junction box or other enclosure located as provided in 680.24. Conduit shall be rigid metal, intermediate metal, liquidtight flexible nonmetallic, or rigid nonmetallic.
(a) Metal Conduit. Metal conduit shall be approved and shall be of brass or other approved corrosion-resistant metal.
(b) Nonmetallic Conduit. Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper equipment ~~grounding~~ bonding conductor shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The equipment ~~grounding~~ bonding conductor shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG equipment ~~grounding~~ bonding conductor in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from the possible deteriorating effect of pool water.
(3) Equipment Grounding Provisions for Cords. Wet-niche luminaires (lighting fixtures) that are supplied by a flexible cord or cable shall have all exposed non–current-carrying metal parts grounded by an insulated copper equipment ~~grounding~~ bonding conductor that is an integral part of the cord or cable. This ~~grounding~~ bonding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure, or other enclosure. The ~~grounding~~ bonding conductor shall not be smaller than the supply conductors and not smaller than 16 AWG.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

The panel does not agree with the submitter's proposal to change the word grounding to bonding in 680.23(B)(3). See panel action and statement on Proposal 17-1.
The panel accepts in principle the remaining portion of this proposal. See panel action and statement on Proposal 17-90.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
CRIVELL: See my Comment on Affirmative for 17-1.

17-92 Log #1428 NEC-P17 **Final Action: Reject**
(680-23(B)(2)(b))

Submitter: David A. Kerr, Jr. Friendsville, PA

Recommendation:

Revise text to read as follows:
(b) Nonmetallic conduit...~~unless a listed low-voltage lighting system not requiring grounding is used.~~ unless the manufacturer's instructions for a listed low-voltage lighting system state that grounding is not required.

Substantiation:

The present wording leaves too much to the imagination. I think my change would be clear. I don't know if 8 AWG insulated wire does anything on a 12 volt light, but I would like a clear rule.

Panel Meeting Action: Reject

Panel Statement:

The recommendation does not add clarity. The listing will determine if grounding is required.

Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-93 Log #2124 NEC-P17 **Final Action: Accept in Principle**
(680-23(B)(2)(b))

Submitter: L. Keith Lofland, International Association of Electrical Inspectors

Recommendation:

Revise Section 680.23(B)(2)(b) to read as follows:
(b) Nonmetallic Conduit. Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper ~~equipment grounding conductor~~ shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The bonding jumper ~~equipment grounding conductor~~ shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG bonding jumper ~~equipment grounding conductor~~ in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from the possible deteriorating effect of pool water.

Substantiation:

The revision as proposed would provide consistency with the use of grounding and bonding terms that parallel those defined terms in other sections of the NEC and Article 100. In these installations, there are components of the grounding and bonding scheme that all provide different roles. The equipment grounding conductor for the equipment (which is the wet niche luminaire (fixture) itself, is included in the cord assembly that is drawn into the nonmetallic raceway to the forming shell. This conductor meets the definition of grounding conductor, equipment in Article 100 and is sized based on the provisions in 680.23(B)(3).
There is a bonding jumper that is a part of the bonding system and is a 8 AWG solid copper conductor that is connected to the outside of the forming shell to the common bonding grid in accordance with 680.26(B)(2).
The 8 AWG copper conductor installed inside the nonmetallic raceway to the forming shell, that is now being called an equipment grounding conductor performs as a bonding jumper to bond the metal shell to the junction box for the wet niche luminaire (fixture). It would seem that the appropriate term for this conductor installed inside the raceway between the forming shell and the deck box would be "bonding jumper" and would be consistent with that defined term in Article 100.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-90.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-94 Log #2672 NEC-P17 **Final Action: Accept in Principle**
(680-23(B)(2)b)

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.23(B)(2)(b) as follows:
(b) Nonmetallic Conduit. Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper ~~equipment grounding conductor~~ shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The bonding jumper ~~equipment grounding conductor~~ shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG bonding jumper ~~equipment grounding conductor~~ in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from the possible deteriorating effect of pool water.

Substantiation:

The use of the term "equipment grounding conductor" in this subsection seems to be in error. Equipment grounding conductors are sized in accordance with 250.122 based on the rating of the overcurrent on the supply side of the circuit. In this case, an 8 AWG conductor is mandated for equipotential bonding and not for its ability to carry fault current to facilitate the operation of an overcurrent device on the line side of the circuit. This proposal will return the language to that of the 1999 and earlier editions of the NEC.
Section 680.23(B)(3) correctly uses the term "equipment grounding conductor" as it relates to the conductor that will carry ground fault current back from the lighting fixture to the source.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-90.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-95 Log #2675 NEC-P17 **Final Action: Accept in Principle**
(680-23(B)(2)(b))

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.23(B)(2)(b) as follows:
(b) Nonmetallic Conduit. Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper ~~equipment grounding conductor~~ shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The bonding jumper ~~equipment grounding conductor~~ shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG bonding jumper ~~equipment grounding conductor~~ in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from the possible deteriorating effect of pool water.

Substantiation:

The use of the term "equipment grounding conductor" in this subsection seems to be in error. Equipment grounding conductors are sized in accordance with 250.122 based on the rating of the overcurrent on the supply side of the circuit. In this case, an 8 AWG conductor is mandated for equipotential bonding and not for its ability to carry fault current to facilitate the operation of an overcurrent device on the line side of the circuit. This proposal will return the language to that of the 1999 and earlier editions of the NEC.
Section 680.23(B)(3) correctly uses the term "equipment grounding conductor" as it relates to the conductor that will carry ground fault current back from the lighting fixture to the source.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-90.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-96 Log #3014 NEC-P17 **Final Action: Accept in Principle**
(680-23(B)(2)(b))

Submitter: Donald R. Offerdahl, North Dakota State Electrical Board

Recommendation:

Revise text as follows:
Nonmetallic Conduit. Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper equipment ~~grounding~~ bonding conductor shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The equipment ~~grounding~~ bonding conductor shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG equipment ~~grounding~~ bonding conductor in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from possible deteriorating effect of pool water.

Substantiation:

Need to provide proper terminology of this conductor, which is a bonding conductor not a grounding conductor.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-90.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-97 Log #3283 NEC-P17 **Final Action: Accept in Principle**
(680-23(B)(2)(b))

Submitter: James J. Rogers, Rogers Electric

Recommendation:

Wherever the words "equipment grounding conductor" appear in the subpart (b) change them to "equipment bonding conductor".

Substantiation:

For many code cycles this conductor was called a bonding conductor and for good reason. Prior to the expanded use of nonmetallic conduit for swimming pool wet niche lighting fixtures there was no requirement for this additional conductor to be installed. That was for good reason as the most common conduit used before was brass and there is no question that this conduit could act as a ground return path if necessary. This conduit, however, acted as an equipment bonding means on a continual basis, it could act as a grounding conductor when and if necessary, therefore it is actually both. When nonmetallic conduit is used there is no metallic path to accomplish bonding and grounding for these fixtures and thus the requirement was brought forward to install an additional conductor in the nonmetallic conduit when it is used for this purpose. This conductor is also a dual purpose conductor, on a daily basis it acts as an electrical bonding means between the pool light deck box and the light itself. The primary grounding conductor for the light is contained in the cord assembly that is required to be part of the lighting fixture. If for some reason the grounding conductor within the fixture cord assembly was no longer functional, and at the same time a ground fault occurred within the wet niche for the lighting fixture then this bonding conductor would have to carry the fault currents from the lighting fixture.

This new wording that appeared in the 2002 NEC has caused confusion in the field to the point where listed deck boxes are being altered in the field so that an additional bonding conductor can be inserted into the deck boxes from the bonding grid around the swimming pool. There was no reason to call this conductor anything other than a bonding conductor, as that is what it primarily is, it only acts as grounding conductor if and when there is a problem and the fixture cord grounding conductor fails to remedy the problem.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-90.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-98 Log #3273 NEC-P17 **Final Action: Accept**
(680-23(B)(6) (New))

Submitter: Leonard F. Devine, Jr. W. Palm Beach, FL

Recommendation:

Add new section 680.23(B)(6) to read as follows:

(6) Servicing. All luminaires shall be removable from the water for relamping or normal maintenance. Luminaires shall not be installed in such a manner that the water level must be reduced or the pool drained for relamping, maintenance, or inspection.

Substantiation:

All too often swimming pools are being installed in such a manner that the adjacent structural foundation is part of the pool wall, especially high end residences. Luminaires are being installed in these combination foundation and pool walls in such a way as they will not allow the relamping of the luminaire unless a person is in the pool, or the water is reduced, and even then people may still be standing in the water for relamping. This is a real potential shock hazard, especially if the luminaire is accidentally energized by someone inside the residence who does not realize that there may be someone working on the pool lighting.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-99 Log #1989 NEC-P17 **Final Action: Reject**
(680-23(C))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:

C) Dry-Niche Luminaires (Fixtures).

(1) Construction. A dry-niche luminaire (lighting fixture) shall be provided with a provision for drainage of water and a means for accommodating one equipment ~~grounding~~ bonding conductor for each conduit entry.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-99a Log #CP1708 NEC-P17 **Final Action: Accept**
(680-23(E))

Submitter: Code-Making Panel 17

Recommendation:

In Section 680.23(E) delete "listed for the purpose,"

Substantiation:

This requirement more accurately reflects the intent of the panel.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-100 Log #2503 NEC-P17 **Final Action: Accept**
(680-23(F)(1))

Submitter: George W. Flach, Nat'l Armored Cable Mfrs' Assn. (NACMA)

Recommendation:

Revise 680.23(F)(1) to include jacketed and non jacketed MC cable as follows:
(F) Branch-Circuit Wiring.
(1) Wiring Methods. Branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet-niche and no-niche luminaires (fixtures), and field wiring compartments of dry-niche luminaires (fixtures), shall be installed using rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, jacketed MC cable, or rigid nonmetallic conduit. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing, MC cable or electrical metallic tubing shall be permitted.
Exception: Where connecting to transformers for pool lights, liquidtight flexible metal conduit, jacketed MC cable, or liquidtight flexible nonmetallic conduit shall be permitted. The length shall not exceed 1.8 m (6 ft) for any one length or exceed 3.0 m (10 ft) in total length used. Liquidtight flexible nonmetallic conduit, Type B (LFNC-B), shall be permitted in lengths longer than 1.8 m (6 ft).

Substantiation:

MC cable should be added because it provides an equivalent wiring method to that currently permitted.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-101 Log #2698 NEC-P17 **Final Action: Accept in Principle**
(680-23(F)(1))

Submitter: Phil Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Assn.

Recommendation:

Revise existing Section 680.23(F)(1) as follows:
(F) Branch-Circuit Wiring.
(1) Wiring Methods. Branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet-niche and no-niche luminaires (fixtures), and the field wiring compartments of dry-niche luminaires (fixtures), shall be installed using rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit or listed Type MC cable having an impervious outer nonmetallic jacket. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing or electrical metallic tubing shall be permitted.

Substantiation:

Listed Type MC cable that has an impervious outer nonmetallic jacket is listed for direct earth burial as well as concrete encasement. The cable contains an insulated equipment grounding conductor and should be an excellent wiring method for the application in this section.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-100.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-102 Log #2702 NEC-P17 **Final Action: Accept in Principle in Part**
(680-23(F)(1))

Submitter: George Straniero, AFC Cable Systems

Recommendation:

Revise 680.23(F)(1) to include liquidtight flexible metal conduit as follows:
(F) Branch-Circuit Wiring.
(1) Wiring Methods. Branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet-niche and no-niche luminaires (fixtures), and the field wiring compartments of dry-niche luminaires (fixtures), shall be installed using rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, liquidtight flexible metal conduit, or rigid nonmetallic conduit. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing, liquidtight flexible metal conduit, or electrical metallic tubing shall be permitted.

Substantiation:

Liquidtight flexible metal conduit should be added because it provides an equivalent wiring method to that currently permitted.

Panel Meeting Action: Accept in Principle in Part

Revise 680.23(F)(1) to include liquid tight flexible metal conduit as follows:
"(F) Branch-Circuit Wiring.
(1) Wiring Methods. Branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet-niche and no-niche luminaires (fixtures), and the field wiring compartments of dry-niche luminaires (fixtures), shall be installed using rigid metal conduit, intermediate metal conduit, liquid tight flexible nonmetallic conduit, liquid tight flexible metal conduit, or rigid nonmetallic conduit. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing, or electrical metallic tubing shall be permitted."
In addition, retain existing exception as is.

Panel Statement:

The liquid tight flexible metal conduit is already allowed within buildings per Chapter 3.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-103 Log #1990 NEC-P17 **Final Action: Reject**
(680-23(F)(2))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(2) Equipment Grounding. Through-wall lighting assemblies, wet-niche, dry-niche, or no-niche luminaires (lighting fixtures) shall be connected to an insulated copper equipment ~~grounding~~ bonding conductor installed with the circuit conductors. The equipment ~~grounding~~ bonding conductor shall be installed without joint or splice except as permitted in (a) and (b). The equipment ~~grounding~~ bonding conductor shall be sized in accordance with Table 250.122 but shall not be smaller than 12 AWG.
Exception: An equipment ~~grounding~~ bonding conductor between the wiring chamber of the secondary winding of a transformer and a junction box shall be sized in accordance with the overcurrent device in this circuit.
(a) If more than one underwater luminaire (lighting fixture) is supplied by the same branch circuit, the equipment ~~grounding~~ bonding conductor, installed between the junction boxes, transformer enclosures, or other enclosures in the supply circuit to wet-niche luminaires (fixtures), or between the field-wiring compartments of dry-niche luminaires (fixtures), shall be permitted to be terminated on grounding terminals.
(b) If the underwater luminaire (lighting fixture) is supplied from a transformer, ground-fault circuit interrupter, clock-operated switch, or a manual snap switch that is located between the panelboard and a junction box connected to the conduit that extends directly to the underwater luminaire (lighting fixture), the equipment ~~grounding~~ bonding conductor shall be permitted to terminate on grounding terminals on the transformer, ground-fault circuit interrupter, clock-operated switch enclosure, or an outlet box used to enclose a snap switch.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-103a Log #CP1710 NEC-P17 (680-24(A)(1)) **Final Action: Accept**

Submitter: Code-Making Panel 17

Recommendation:

In Section 680.24(A)(1) change "listed and labeled for the purpose" to "listed as a swimming pool junction box".

Substantiation:

This proposal more accurately reflects the intent of the panel.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-103b Log #CP1709 NEC-P17 (680-24(A)(1)(1)) **Final Action: Accept**

Submitter: Code-Making Panel 17

Recommendation:

In Section 680.24(A)(1)(1) delete "listed for the purpose".

Substantiation:

This change more accurately reflects the intent of the panel.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-103c Log #CP1711 NEC-P17 (680-24(B)(1)(1)) **Final Action: Accept**

Submitter: Code-Making Panel 17

Recommendation:

In Section 680.24(B)(1)(1) delete "listed for the purpose".

Substantiation:

This change more accurately reflects the intent of the panel.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-104 Log #55 NEC-P17 (680-25(A)) **Final Action: Accept in Principle in Part**

NOTE: The following proposal consists of Comment 20-27 on Proposal 20-30a in the 2001 May Meeting National Electrical Code Committee Report on Proposals. This comment was held for further study during the processing of the 2002 NATIONAL ELECTRICAL CODE. [See Proposal 17- (Log #42)]

Comment 20-27 received the following Technical Correlating Committee Note:

It was the action of the Technical Correlating Committee that this comment be reported as "Hold" because the panel states that the comment introduces new material that has not had public review.

Submitter: Monte R. Ewing, State of Wisconsin

Recommendation:

Revise as follows:

Feeders shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, liquidtight flexible metallic conduit, or liquidtight flexible nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building or structure. Electrical nonmetallic tubing and listed metal-clad cable containing an insulated equipment grounding conductor shall be permitted where installed within a building.

Substantiation:

I thought the panel may have overlooked the use of flexible metallic liquidtight conduit and the wood decking below a hot tub may be called a structure rather than a building by some states. The MC cable with an insulated equipment grounding conductor will provide the panel's intent of providing an insulated equipment grounding conductor and a physical protective covering. Sometimes nonflexible piping is difficult to install (such as where fished) and another option to liquidtight conduit (which is difficult to pull conductors through on long rungs) would help.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See panel action on Proposal 17-108. The panel did not accept the phrase " or structure" because it is too broad a term.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-106 Log #2699 NEC-P17 **Final Action: Accept in Principle**
(680-25(A))

Submitter: Phil Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Assn.

Recommendation:

Revise existing Section 680.25(A) as follows:
(A) Wiring Methods. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit or listed Type MC cable. Electrical metallic tubing shall be permitted where installed on or within a building, and electrical nonmetallic tubing shall be permitted where installed within a building.

Substantiation:

Listed Type MC cable provides excellent protection from physical damage in compliance with the UL Product Safety Standard. In addition, Type MC cable contains an insulated equipment grounding conductor that is in compliance with Section 250.122. As a result, Type MC cable is an excellent wiring method for feeders to panelboards for swimming pool equipment.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action on Proposal 17-108.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-107 Log #2701 NEC-P17 **Final Action: Accept in Principle**
(680-25(A))

Submitter: George Straniero, AFC Cable Systems

Recommendation:

Revise 680.25(A) to include liquidtight flexible metal conduit as follows:
(A) Wiring Methods. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, Liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building, and electrical nonmetallic tubing shall be permitted where installed within a building.

Substantiation:

Liquidtight flexible metal conduit should be added because it provides an equivalent wiring method to that currently permitted.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-108.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-108 Log #2989 NEC-P17 **Final Action: Accept in Principle**
(680-25(A))

Submitter: Monte Ewing, State of Wisconsin

Recommendation:

Revise as follows:
Feeders shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, liquidtight flexible metallic conduit, or liquidtight flexible nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building. Flexible metal conduit, electrical nonmetallic tubing, and listed metal-clad cable containing an insulated equipment grounding conductor shall be permitted where installed within a building.

Substantiation:

I have added liquidtight flexible metal conduit, flexible metal conduit, and metal-clad cable to the list of wiring methods. It is apparent that the code panel intended to provide feeder conductors with a minimum form of physical protection. The additional wiring methods will provide an equivalent level of protection as some of the presently listed methods. Many times a feeder has to be fished in and a flexible wiring method is preferred.

Panel Meeting Action: Accept in Principle

Revise as follows:
(A) General. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, liquid tight flexible metal conduit, liquid tight flexible nonmetallic conduit or as metal-clad cable. Electrical metallic tubing shall be permitted where installed on or within a building. Flexible metal conduit, electrical nonmetallic tubing shall be permitted where installed within a building.

Panel Statement:

The phrase "containing an insulated equipment grounding conductor " is already required for all feeders in 680.25. Metal clad cable was moved from the third sentence to the first sentence to allow its use generally as a feeder. The term listed was removed since it is already required by Article 330.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-105 Log #1991 NEC-P17 **Final Action: Reject**
(680-25(A) and (B))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(A) Wiring Methods. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building, and electrical nonmetallic tubing shall be permitted where installed within a building.
Exception: An existing feeder between an existing remote panelboard and service equipment shall be permitted to run in flexible metal conduit or an approved cable assembly that includes an equipment ~~grounding~~ bonding conductor within its outer sheath. The equipment ~~grounding~~ bonding conductor shall comply with 250.24(A)(5).
(B) Grounding. An equipment ~~grounding~~ bonding conductor shall be installed with the feeder conductors between the grounding terminal of the pool equipment panelboard and the grounding terminal of the applicable service equipment or source of a separately derived system. For other than (1) existing feeders covered in 680.25(A), Exception or (2) feeders to separate buildings that do not utilize an insulated equipment ~~grounding~~ bonding conductor in accordance with 680.25(B)(2), this equipment ~~grounding~~ bonding conductor shall be insulated.
(1) Size. This conductor shall be sized in accordance with 250.122 but not smaller than 12 AWG. On separately derived systems, this conductor shall be sized in accordance with Table 250.66 but not smaller than 8 AWG.
(2) Separate Buildings. A feeder to a separate building shall be permitted to supply swimming pool equipment branch circuits, or feeders supplying swimming pool equipment branch circuits, if the grounding arrangements in the separate building meet the requirements in 250.32. Where installed, a separate equipment ~~grounding~~ bonding conductor shall be an insulated conductor.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-109 Log #1015 NEC-P17 **Final Action: Reject**
(680-25(B))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise the first paragraph to read: "Except as permitted in 680.25(B)(2), an equipment grounding conductor shall be installed with the feeder conductors between the grounding terminal of the pool equipment panelboard and the grounding terminal of the applicable service equipment or source of a separately derived system. For other than (1) existing feeders covered in 680.25(A), Exception, or (2) feeders to separate buildings that do not utilize an equipment grounding conductor in accordance with 250.32(B)(2), this equipment grounding conductor shall be insulated."

Substantiation:

As currently written, this rule has at least three very confusing aspects. First, the first sentence says there must be an equipment grounding conductor, and does not recognize any alternatives, although alternatives are mentioned later. Second, there is no provision in 680.25(B)(2) for using an uninsulated equipment grounding conductor, but 680.32 does recognize 250.32 which permits the equipment grounding conductor to be eliminated in specific cases, even though it was already stated that there must be one. Third, with regard to equipment grounding conductors, Section 250.32 does not mention insulated (or uninsulated) equipment grounding conductors, 250.32(B) just covers when any equipment grounding conductor is required (and how it is connected). In effect, the section now says you must have an equipment grounding conductor, and except where an insulated conductor is not "utilized," the conductor must be insulated. Then, it says that in some cases an equipment grounding conductor may not be installed but repeats that where it is installed it must be insulated. This submitter has no objection to the repetition, only to the confusing contradictions. This submitter believes the punctuation is questionable too, but punctuation is not addressed in this proposal.

Panel Meeting Action: Reject

Panel Statement:

The proposed text does not add clarity and the substantiation is not convincing.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-110 Log #2773 NEC-P17 **Final Action: Accept**
(680-25(B)(2))

TCC Action:

The Technical Correlating Committee understands that the recommended change in this Proposal is in addition to those changes made in Proposals 17-111 and 17-112.

Submitter: Gary Boughton, Boughton Pools

Recommendation:

Insert new text:
Insert the words or structure after the word building in the first line, to read "separate building or structure shall be permitted".

Substantiation:

As now worded 680.25(B)(2) only allows a feeder from a separate building. This would make the wording clear that the intent is to also allow a feeder from a structure.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-111 Log #3187 NEC-P17 **Final Action: Accept**
(680-25(B)(2))

TCC Action:

The Technical Correlating Committee understands that the recommended change in this Proposal is in addition to those changes made in Proposals 17-110 and 17-112.

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Mass Electrical Code Adv. Committee

Recommendation:

Where installed in other than existing feeders covered in 680.25(A) Exception, a separate equipment grounding conductor shall be an insulated conductor.

Substantiation:

This proposal removes a direct conflict with 680.25(A) Exception, which allows for bare equipment grounding conductors in existing feeders.

Panel Meeting Action: Accept

Clarify that this proposal modifies the last sentence of 680.25(B)(2).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-112 Log #3282 NEC-P17 **Final Action: Accept**
(680-25(B)(2))

TCC Action:

The Technical Correlating Committee understands that the recommended change in this Proposal is in addition to those changes made in Proposals 17-111 and 17-111.

Submitter: James J. Rogers, Rogers Electric

Recommendation:

Revise subpart (2) of 680.25(B) to read as follows:
A feeder to a separate building shall be permitted to supply swimming pool equipment branch circuits, or feeders supplying swimming pool equipment branch circuits, if the grounding arrangements in the separate building meet the requirements in 250.32(B)(1). Where installed, a separate equipment grounding conductor shall be an insulated conductor.

Substantiation:

250.32 allows a grounded conductor to serve as both grounded and grounding at a separate building provided there are no metallic paths between the main building and the separate building. The reason for this is the obvious hazard of flowing normal grounded conductor currents on grounded metal objects. If using a three wire system at a separate building, one must bond the grounded conductor to a disconnecting means enclosure and some type of grounding electrode located at the second building. If the electrode is in close proximity to the pool and the bonding grid of the pool provides a current path back to the main building grounding electrode system, you could very possible flow normal neutral currents through the pool bonding grid, posing an obvious hazard to persons using the pool. It was always required to utilize a four wire system with separate grounding and grounded conductors for a second building feeder where swimming pool equipment was supplied through the second building until the 680 rewrite in the 2002 NEC. There was no stand alone technical substantiation for changing this requirement, it simply went through with the rest of the rewrite. I hope that the panel can revisit this issue as I feel it is a compelling safety issue.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-113 Log #3523 NEC-P17 **Final Action: Reject**
(680-25(D))

Submitter: Mark E. Dunlap, Apex Electric Inc.

Recommendation:

Install at a minimum of 5 ft from the inside of pool.

Substantiation:

I have seen panels as close as 25 in. from pool water.
No distance has ever been stated on how far a panel should be from pool walls?

Panel Meeting Action: Reject

Panel Statement:

See 680.22(C). A panelboard is normally equipped with switches. See 680.26(B)(5) for bonding.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-114 Log #450 NEC-P17 **Final Action: Accept in Principle**
(680-26)

Submitter: Jeffrey Ciccone, Connectiv Power Delivery/Atlantic City Electric Co.

Recommendation:

Add new text to read as follows:
Where a pool has non-metallic water piping a plate electrode of at least 12 square inches shall be installed in the pool below the surface of the pool water and bonded. For pools over 30 ft. in length, two plate electrodes shall be installed separated by at least 20 ft.

Substantiation:

Frequently, a difference of potential exists between the surrounding area (earth, concrete, etc.) and the pool water. Since non-metallic piping is the preferred material to supply the pool, the plate electrodes will ensure that the potential difference is eliminated. In the last 3 years of troubleshooting pool shock complaints for my employer, I have encountered pools where the water is effectively insulated from ground because of plastic piping, pump housing, double insulated pump motors, vinyl liners and PVC ladders. Even though the pool water is insulated, a capacitor like effect occurs between the surrounding earth and pool water. This "capacitor" allows AC voltage to be present.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action on Proposal 17-120.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-115 Log #2673 NEC-P17 **Final Action: Accept**
(680-26)

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.26 as follows:

680.26 Equipotential Bonding.

(A) Performance. The equipotential bonding required by this section shall be installed to eliminate voltage gradients in the pool area as prescribed.

FPN: This section does not require that the 8 AWG or larger solid copper bonding conductor be extended or attached to any remote panelboard, service equipment, or any electrode.

(B) Bonded Parts. The parts specified in 680.26(B)(1) through (B)(5) shall be bonded together.

(1) Metallic Structural Components. All metallic parts of the pool structure, including the reinforcing metal of the pool shell, coping stones, and deck, shall be bonded. The usual steel tie wires shall be considered suitable for bonding the reinforcing steel together, and welding or special clamping shall not be required. These tie wires shall be made tight. If reinforcing steel is effectively insulated by an encapsulating nonconductive compound at the time of manufacture and installation, it shall not be required to be bonded. Where reinforcing steel is encapsulated with a nonconductive compound, provisions shall be made for an alternate means to eliminate voltage gradients that would otherwise be provided by unencapsulated, bonded reinforcing steel.

(2) Underwater Lighting. All forming shells and mounting brackets of no-niche luminaires (fixtures) shall be bonded unless a listed low-voltage lighting system with nonmetallic forming shells not requiring bonding is used.

(3) Metal Fittings. All metal fittings within or attached to the pool structure shall be bonded. Isolated parts that are not over 100 mm (4 in.) in any dimension and do not penetrate into the pool structure more than 25 mm (1 in.) shall not require bonding.

(4) Electrical Equipment. Metal parts of electrical equipment associated with the pool water circulating system, including pump motors and metal parts of equipment associated with pool covers, including electric motors, shall be bonded. Metal parts of listed equipment incorporating an approved system of double insulation and providing a means for grounding internal nonaccessible, non–current-carrying metal parts shall not be bonded.

Where a double-insulated water-pump motor is installed under the provisions of this rule, a solid 8 AWG copper conductor that is of sufficient length to make a bonding connection to a replacement motor shall be extended from the bonding grid to an accessible point in the motor vicinity. Where there is no connection between the swimming pool bonding grid and the equipment grounding system for the premises, this bonding conductor shall be connected to the equipment grounding conductor of the motor circuit.

(5) Metal Wiring Methods and Equipment. Metal-sheathed cables and raceways, metal piping, and all fixed metal parts that are within the following distances of the pool, except those separated from the pool by a permanent barrier, shall be bonded ~~that are within the following distances of the pool:~~

(1) Within 1.5 m (5 ft) horizontally of the inside walls of the pool

(2) Within 3.7 m (12 ft) measured vertically above the maximum water level of the pool, or any observation stands, towers, or platforms, or any diving structures

(C) Equipotential ~~Common~~ Bonding Grid. The parts specified in 680.26(B) shall be connected to an equipotential ~~a common~~ bonding grid with a solid copper conductor, insulated, covered, or bare, not smaller than 8 AWG. Connection shall be made by exothermic welding or by pressure connectors or clamps that are labeled as being suitable for the purpose and are of stainless steel, brass, copper, or copper alloy. The equipotential ~~common~~ bonding grid shall be permitted to be any of the following:

(1) The structural reinforcing steel of a concrete pool where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent

(2) The wall of a bolted or welded metal pool

(3) A solid copper conductor, insulated, covered, or bare, not smaller than 8 AWG

(4) Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal conduit

(D) Connections. Where structural reinforcing steel or the walls of bolted or welded metal pool structures are used as an equipotential ~~a common~~ bonding grid for nonelectrical parts, the connections shall be made in accordance with 250.8.

(E) Pool Water Heaters. For pool water heaters rated at more than 50 amperes that have specific instructions regarding bonding and grounding, only those parts designated to be bonded shall be bonded, and only those parts designated to be grounded shall be grounded.

Substantiation:

Changes are being proposed to this section in an attempt to clarify the purpose of the bonding required by this section. It seems clear from 680.26(A) that the bonding is done here "to eliminate voltage gradients in the pool area as prescribed." This equipotential bonding differs from the bonding defined in Article 100 as "Bonding (Bonded). The permanent joining of metallic parts to form an electrically conductive path that ensures electrical continuity and the capacity to conduct safely any current likely to be imposed."

In spite of the improvements to Article 680 made by CMP-20 in processing the 2002 NEC, this section can be improved to clarify the purpose of bonding. This improvement will aid the students of the NEC as well as the instructors.

The changes proposed to (B)(5) are intended to be editorial.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

JOHNSON: The following affirmative comment adds clarity to the proposal 680.26(C)(3).

680.26(C) The equipotential bonding grid shall be permitted to be any of the following:

(3) A continuous bare solid copper conductor, ~~insulated, covered, or bare~~ not smaller than 8 AWG shall be installed under the pool deck area parallel to the water's edge. The grid shall be installed in progressive loops 18 inches on center starting within 6 inches of the water's edge to a distance not less than 60 inches from the water's edge. A tolerance of +/- three inches shall be allowed for conductor deflection.

Reason:

1. A bare conductor in contact with the ground is required to form a conductive.

2. 680.26(B)(1) requires coping stones and decks made with pavers using concrete, brick, or stone without conductive reinforcing steel

have an alternate means to eliminate voltage gradients. 680.26(C)(3) provides the alternate method.
3. For encapsulated reinforcing steel see new Proposal 17-124.

17-116 Log #3522 NEC-P17 **Final Action: Reject**
(680-26)

Submitter: Mark E. Dunlap, Apex Electric Inc.

Recommendation:

Revise text to read as follows:
[Pool Coping] Install bonding straps to connect all coping together, marking, continuous length, bonded to grid.

Substantiation:

I have seen people cleaning the walls of the pool with metal pole and touch pole to coping and get shocked.
Coping needs to be connected together and bonded to grid.

Panel Meeting Action: Reject

Panel Statement:

Coping is not an electrical material and not normally installed by electrical personnel. The requirement for strapping the coping would more properly be in the building code.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

17-117 Log #1014 NEC-P17 **Final Action: Reject**
(680-26(B)(4))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Change the second sentence in the first paragraph and add another sentence as follows: "Metal parts of listed equipment incorporating an approved system of double insulation and providing a means for grounding internal nonaccessible, non-current-carrying metal parts shall not be bonded by a direct connection to the common bonding grid. The grounding means for internal parts of double insulated equipment shall be connected to the equipment grounding conductor of the motor circuit as required by 680.6.
Change the second sentence of the second paragraph to an Exception.

Substantiation:

This is a highly confusing and contradictory section, and the Code-Making Panel may well devise different language to clarify these rules, which would be welcomed by this submitter. In the existing text, the first sentence requires all metal parts to be bonded. The second sentence prohibits metal parts of double insulated pump motors from being bonded, but implies that the internal parts must be grounded although it does not actually say what to do with this grounding means. If the grounding means is used, it will, in most cases, result in the internal parts being indirectly bonded to the common grounding grid by way of equipment grounding interconnections. Thus, meeting the implied requirement of the second sentence violates the first sentence. In the second sentence of the second paragraph, the common grounding grid is required to be connected to the equipment grounding conductor of the pump circuit if such a connection is not already made. This will also result in a direct violation of the rule not to bond the internal parts, which are "metal parts of listed equipment incorporating an approved system of double insulation," so this rule should be completely reworded or changed to an Exception. Since three of the four rules (sentences) in this section are contradictory, the proposal is intended to clarify what bonding connection is prohibited, and when such connections are actually permitted and required. This submitter recognizes that an effort has been and is being made to eliminate Exceptions in an effort to improve code usability. However, in some cases, Exceptions are easier to understand. This section, as presently written, is not very user-friendly.

Panel Meeting Action: Reject

Panel Statement:

The proposal does not add clarity to the present requirement.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-118 Log #1992 NEC-P17 **Final Action: Reject**
(680-26(B)(4))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(4) Electrical Equipment. Metal parts of electrical equipment associated with the pool water circulating system, including pump motors and metal parts of equipment associated with pool covers, including electric motors, shall be bonded. Metal parts of listed equipment incorporating an approved system of double insulation and providing a means for grounding internal nonaccessible, non–current-carrying metal parts shall not be bonded.
Where a double-insulated water-pump motor is installed under the provisions of this rule, a solid 8 AWG copper conductor that is of sufficient length to make a bonding connection to a replacement motor shall be extended from the bonding grid to an accessible point in the motor vicinity. Where there is no connection between the swimming pool bonding grid and the equipment ~~grounding~~ bonding system for the premises, this bonding conductor shall be connected to the equipment ~~grounding~~ bonding conductor of the motor circuit.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-119 Log #1828 NEC-P17 **Final Action: Reject**
(680-26(B)(5)1)

Submitter: David Zinck, NewburyPort Wiring Inspector

Recommendation:

Revise as follows:
(1) Within ~~1.5 m (5 ft)~~ 3m (10 ft) horizontally of the inside walls of the pool.

Substantiation:

It is a common practice for pool owners to use the aluminum pole and skimmer to clean the pool while wading through it. And after you get a skimmer full of wet leaves and insects to reach out and strike it against the fence or whatever is available to knock these things off the skimmer. If this is a chain link or any other metal fence, or the central air condenser, etc. there is the possibility to be making contact with something that is at an electrical potential much higher than the pool.
We had an incident in Salisbury, MA in '79 or '80 where there was a chain link fence just beyond the 5 ft bonding requirement at the pool end of a brand new (name deleted) (or similar) pool slide. A child hung onto the chain link fence and leaned to give his friend a hand getting out of the pool. Nobody was aware that the fence was getting electricity from a ground fault from something unrelated to the pool that might have been faulting to earth for years. As memory serves me, one child died, the other survived. This is well documented in Massachusetts as it led to the creation of MGL 166 Section 32.

Panel Meeting Action: Reject

Panel Statement:

The submitter does not provide enough substantiation to expand the present requirement.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-120 Log #304 NEC-P17 **Final Action: Accept**
(680-26(B)(6))

Submitter: Cecil Criss, Choptank Electric Coop

Recommendation:

Revise text to read as follows:

(B) Bonded Parts. The parts specified in 680.26(B)(1) through ~~(B)(5)~~ (B)(6) shall be bonded together.

(6) Pool Water. The pool water shall be effectively bonded. Pool shells made of reinforced concrete in which the water is in direct contact with the concrete and the reinforcing steel is utilized as the common bonding grid shall be considered to effectively bond the water. If non-conducting or non-reinforced material is used to form the pool shell or liner, bonding shall be accomplished via the use of metallic parts, plumbing, lighting brackets and shells, ladders, electrodes, etc., in continuous contact with the water. The metal shall be copper, brass, bronze, or other corrosion resistant material or may be chrome plated. Metallic parts used for bonding shall have a minimum surface area in contact with the water of 200 square centimeters. Semi-conducting material may be used if the resistivity of such material is less than 0.1 ohm-centimeters. Semi-conducting material shall have a minimum of 0.5 square meters in contact with the pool water at each location and encapsulate copper conductor evenly distributed throughout. The encapsulated copper conductor shall have a total electrical area of at least 16,500 circular mils and have terminations of at least 8 AWG. Point of bonding with the pool water shall be made at no more than 4 meters distance around the circumference of the pool.

Substantiation:

The past three revisions of the National Electrical Code® (NEC) Article 680.26 (2002 edition or equivalent) have neglected to include the swimming pool water itself in the parts of the pool structure that should be bonded together. This is significant because an electric potential (voltage) may exist between the grounded conductors of an electric system and local "earth" ground. This potential is most frequently referred to as "stray voltage" but may synonymously be called ground potential rise (GPR) and neutral-to-earth (NTE) voltage. It is generally thought that grounded conductors (and equipment grounds) are at the same potential as "earth" ground: however, due to many complex issues, this is rarely the case. Adding grounding electrodes seldom has a beneficial effect on this voltage. Generally speaking, NTE potential is continually present and fluctuates in magnitude depending on system load, balance, and soil moisture. Any GPR that occurs during fault conditions however, will also be impressed into the pool environment, most notably between the pool water and any equipment bonded to a grounded electrical system conductor.

Non-conductive materials used in the construction of contemporary pools generally prevent the pool water from coming into electrical contact with the grounding conductors of the electric system (through such obvious means as bonded metallic plumbing or steel reinforced concrete sides). Pool water becomes "bonded" to the local "earth" potential by water seepage through the vinyl liner. On the other hand, NTE voltage is brought into the pool vicinity by the equipment grounding conductor that is connected to the pool circulation pump and pool Common Bonding Grid required by the NEC 680.26. The concrete deck, metallic coping, stanchions, and other metallic fittings are brought to the potential of the electrical grounding system thereby allowing a potential difference to develop between the pool water and its surroundings.

As 680.26 attempts to address, the most adequate solution to potential differences within the pool environment is to ensure that all conductive media included in or on the pool structure are bonded together in a common equipotential bonding grid. The pool water must also be effectively bonded to the common bonding grid to eliminate a voltage differential developing between it and its otherwise bonded surroundings. Semi-conducting material should probably be included as well.

Previous editions of the NEC required the Common Bonding Grid to be bonded to the pool filtration pump. This is the most common path that inadvertently introduces NTE potential to the pool deck and fittings. The 1996 and 1999 editions of the NEC incorporated language that allowed the possibility of disconnecting the Common Bonding Grid from an equipment grounding conductor. Per 680-22(a)(4) [1999 edition], if a listed double insulated pump was used, bonding of the common bonding grid to the metal parts of the pump "shall not be made" which made it possible to isolate the pool environment from the grounded conductors of the electric system. However, this alternative would only work if there were no other metal fittings such as electric receptacles or underwater lighting which have a connection to an equipment grounding conductor as required elsewhere in the NEC. Since metal fittings must be bonded to the Common Bonding Grid, if they are also grounded via an equipment grounding conductor, NTE potential is again introduced into the pool surroundings. This language has been expunged from the 2002 edition. Specifically, the last sentence of 680.26(B)(4) states, "Where there is no connection between the swimming pool bonding grid and the equipment grounding system for the premises, this bonding conductor shall be connected to the equipment grounding conductor of the motor circuit." This sentence is contradictory to the FPN note in 680.26(A) in that it effectively (indirectly) connects the copper bonding conductor to a remote panelboard, service equipment, or electrode. Regardless, the key is either a complete equipotential plane involving pool water or elimination of the transference of NTE potential within the pool environment.

In limited circumstances, a neutral isolator installed at the utility's distribution transformer may minimize NTE potential. However, a neutral isolator will be electrically by-passed by other grounded systems such as telephone and cable TV rendering it ineffectual. It does not resolve NTE potential that originates on the load side of the isolator. Furthermore, there is no reasonable way of knowing whether or not a neutral isolator is functioning properly once it has been installed. A malfunctioning isolator will most likely be detected only during an abnormal system condition which may create another hazard.

Ironically, the NEC's requirement to have a Common Bonding Grid connected to an equipment ground that does not include the pool water is creating voltage gradients within a pool area vice eliminating them.

Solutions:

(1) An equipotential plane which must include the pool water is the safest and most reliable remedy to voltage gradients within the pool environment, regardless of the source.

(2) Language similar to the 1999 edition [680-22(a)(4)] for utilization of a double insulated pump to potentially eliminate the requirement to bond the Common Bonding Grid to an equipment grounding conductor. This would enable a reasonable retrofit option for existing pools.

Consequences of inaction: Homeowners will disconnect equipment grounds as a jury rig to eliminate the transference of NTE potential within the pool environment thereby creating greater hazards.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

[illegible]

HIRSCH: The submitter has not provided adequate technical substantiation to describe the problem source nor has the submitter provided adequate technical substantiation that this solution of effectively bonding the water is practical and will eliminate problems in all cases. We recommend including representation from Code-Making Panel 5 on Panel 17's task group that was appointed to study this proposal in detail.

17-121 Log #1011 NEC-P17 (680-26(C)) **Final Action: Accept**

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise the second sentence to read:
"Connection shall be made by exothermic welding or by listed pressure connectors or clamps ..." (remainder to be unchanged).

Substantiation:

Section 250.8 requires grounding and bonding connection fittings to be listed, not just identified. Since this section could modify Article 250, and may legitimately be interpreted that way, the intent should be clearer.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-122 Log #1699 NEC-P17 (680-26(C)) **Final Action: Accept in Principle in Part**

Submitter: Gregory L. Olson, Public Service Electric & Gas Company

Recommendation:

Revise text as follows:
(C) Common bonding grid. The parts specified in 680.26(B) shall be connected to a common bonding grid with a solid copper conductor, insulated, covered, or bare, not smaller than 8 AWG. Connection shall be made by exothermic welding or by pressure connectors or clamps that are labeled as being suitable for the purpose and are of stainless steel, brass, copper, or copper alloy. The common bonding grid shall be permitted to be any of the following:
(1) The structural reinforcing steel of a concrete pool <u>and deck</u> where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent
(2) The wall of a bolted or welded metal pool
(3) A solid copper conductor, insulated, covered, or bare, not smaller than 8 AWG
(4) Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal conduit
<u>FPN: Where the use of interlocking paving stones as a deck surface eliminates the need for reinforcing steel, a suitable grid must be installed using methods (3) or (4) above or an equivalent.</u>

Substantiation:

Numerous instances have been encountered where voltage gradients have been found to exist between a properly grounded and bonded swimming pool, packaged or self-contained spa or hot tub and the interlocking paving stone deck surface installed surrounding it. Investigations of such conditions typically reveal that the paving stone surface does not posses suitable means by which bonding can be established and thus the necessity of creating an equipotential ground surface has been neglected.

Panel Meeting Action: Accept in Principle in Part

Add a new FPA to follow section 680.26(C) (5)(4) to read as follows:
<u>FPA: The installation of a bonding grid under non-reinforced concrete or other nonconductive decking in direct contact with the earth will provide additional safety.</u>

Panel Statement:

A FPA can not contain mandatory text. The changes are made to satisfy the intent of the submitter. The panel desires to make the suggestion more performance orientated as it address safety. The panel did not accept the addition of the term deck since it is already covered in 680.26(B)(1).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

HIRSCH: This FPN should follow the requirements of the NEC Style Manual.

17-123 Log #1012 NEC-P17 **Final Action: Accept**
(680-26(C)(4))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise item (4) by deleting "intermediate metal conduit."

Substantiation:

According to 342.2, IMC is a steel conduit by definition. Since only steel IMC is recognized by Article 342 and only listed conduit is permitted by Article 342, this section as written refers only to an imaginary product. According to the UL Electrical Construction Equipment Directory, IMC could be made of other materials such as aluminum or wrought iron, but such products are not recognized by the definition in the NEC, and would not be corrosion resistant for use in swimming pool areas. For that matter, brass rigid metal conduit is not typically available as a listed product as required by Article 344, and the definition in 344.2 recognizes only aluminum, silicon bronze, and stainless steel. However, at least in the case of RMC, the silicon bronze or stainless steel could be considered as corrosion resistant for swimming pool use, depending on the composition of the stainless steel. (Some alloys of stainless steel are not suitable for use around chlorine.) During the 2002 code cycle, the code panel said they did not want to limit the use of future products, but those products are already limited by other definitions and requirements in the code. Retaining this language is not "user-friendly" as it falsely leads one to believe there is such a product. If the Code-Making Panel intends to allow the use of unlisted products (or products that do not exist) that intent should be more clearly stated so that code users will know that this section is modifying the requirements of Chapter 3.

Panel Meeting Action: Accept

Editorially revise the deletion to include "or intermediate metal conduit" in (4).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Explanation of Negative:

17-124 Log #3153 NEC-P17 **Final Action: Accept**
(680-27, 680.26(B)(1) and 680.26(D))

TCC Action:

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

Submitter: Scott Cline, McMurtrey Electric Inc.

Recommendation:

1) Add a new 680.27 Alternate Voltage Gradient Suppression System, as follows:
680.27 Alternate Voltage Gradient Suppression System. If nonconductive reinforcing is utilized with an electrically conductive containment media, an alternative voltage gradient suppression system shall be installed. This system may be constructed as specified in 680.27(1) through 680.27(6).
(1) Material and Connections. The system shall be constructed of minimum 8 AWG bare solid copper conductor. Conductors shall be bonded to each other at all points of crossing. Connection shall be made as required by 680.26(C).
(2) Containment Structure Rings. The system shall include horizontal rings starting within 8 cm (3 in.) of normal waterline. Horizontal rings shall be placed below the waterline ring, and in any walls above, at intervals of no more than 45 cm (18 in.). Where an above-water wall is not continuous around the structure, the ends of the ring shall be bonded to the next ring below.
(3) Deck Rings. Rings shall also be constructed underneath, but within 8 cm (3 in.) of, any deck surrounding the water, at intervals of no more than 45 cm (18 in.) from the nearest containment ring, to a maximum of 130 cm (51 in.).
(4) Ring Spacing Tolerance. The acceptable installation error from the waterline ring to any one of the other rings shall be plus-or-minus 8 cm (3 in.).
(5) Ring-bond Conductors. The rings of 680.27(2) and (3) shall be bonded to two ring-bond conductors which cross at the center of the lowest ring, and continue out and up to the water-level ring. They shall take a path which brings them to points which divide the length of the waterline ring into four parts equal within 1 percent of the ring's overall length. They shall continue up vertically to any higher level rings. The ring-bond wires shall then continue away from the water line to any deck rings.
(6) Securing. The below-grade system shall be attached to adjacent reinforcing framework to ensure embedment within the containment media.
And as a result of its adoption:
2) Delete the last sentence of 680.26(B)(1): ~~Where reinforcing steel is encapsulated with..~~;
3) Add: 680.26(B)(6) The system of 680.27, if installed;
4) Add: 680.26(C)(5) The system of 680.27;
5) Add into 680.26(D): Where structural reinforcing steel or the system of 680.27 or the walls of bolted or welded . . .
As an alternative, the new section 680.26(B)(6) above could be numbered as 2, with the existing 2 through 5 being changed to 3 through 6, and the new section 680.26(C)(5) above could be numbered as 2, with the existing 2 through 4 being changed to 3 through 5.

Substantiation:

At the adoption of the 2002 Code, Panel 20 recognized that the loss of reinforcing steel as an electrical current protection for persons in and around a pool due to encapsulation with a non-conductive compound needed to be compensated for. The last sentence of 680-26(B)(1) was added to address this issue. The proposed 680.27 is intended to give at least one method which will satisfy the need for alternative protection. If it is adopted, the other changes are needed to integrate the new 680.27 into the Code. I hope I have found all related issues.

For proposal item 1): This proposal is the outcome of investigation into the subject of how to provide the "provisions" referenced at the end of 680.26(B)(1) during the adoption of the 2002 Code. It was known that through-the-earth currents needed to be controlled to help protect persons in or around the water. Attempting to provide equipotential bonding of all of the area's surfaces is what is needed. The best authoritative reference discovered is ASAE EP473.2 JAN01 "Equipotential Plane in Livestock Containment Areas." from the American Society of Agricultural Engineers. This document's requirements address a different set of problems presented by the very conductive hooves of livestock, especially cows which suffer productivity loss at extremely low current levels, but it specifically references the danger to persons of step potential and touch potential at distance of 1 m (3 ft) or greater. The 45 cm (18 in) dimension used in the proposed text allows any one piece of the system to become ineffective without exceeding the 1 m (3 ft) distance.

For 680.27 General Description: The new 680.27 is intended to require the construction of the described system when nonconductive reinforcing is used within a conductive media. Concrete as now used is conductive, but the system is of no use if some future media is used which is not conductive.

For 680.27(1): The materials and connections are intended to be the same as have been utilized for pools previously.

For 680.27(2): The containment structure rings are intended to create a pattern where no through-earth conductive pathway through the containment media can be more than about 45 cm (18 in.) from a system conductor.

For 680.27(3): The containment deck rings are intended to create a pattern where no through-earth conductive pathway adjacent to the bottom of the deck can be more than about 45 cm (18 in.) from a system conductor. The deck is not constantly in contact with water, and therefore the grid is placed below the deck. This is to help ensure that the grid is in conductive contact with the earth below the deck, and to lower the effect of the system presenting a gradient to the top of the deck.

For 680.27(4): The tolerance specification is intended to recognize that any one ring cannot be perfectly placed, but not allow the error to continue to accumulate. The first ring away from the waterline could be between 37 and 52 cm, but the second would have to be between 82 and 98 cm. If we allowed the measurements to be made from the adjacent ring, then the distance to the waterline ring could be between 76 and 106 cm.

For 680.27(5): The ring-bond conductors are intended to provide multiple-path bonding of the rings such that many connections could fail without affecting the effectiveness of the system. The 1% figure (IE: 1 foot in 100 feet) is to assure reasonably even installation.

For 680.27(6): The securing is intended to keep the conductors from being displaced or connections excessively strained while the media is put in place.

For Proposal Item 2): Delete the last sentence of 680.26(B)(1). is believed inappropriate to the item-listing purpose of 680.26(B), and becomes redundant if 680.27 is adopted.

For Proposal Item 3): Add 680.26(B)(5) The system of 680.27, if installed. is believed required to include the system in the bonding requirement.

For Proposal Item 4): The addition of 680.26(C)(6) The system of 680.27. is believed required to include the system in the Common Bonding Grid group.

For Proposal Item 5): The addition into 680.26(D)...steel or the system of 680.27 or...is believed required to include the system in the structure and requirement of 680.26(D).

It may be hard to believe, but I did attempt to minimize the volume of words. I hope that you find this to be at least a useful framework.

Panel Meeting Action: Accept

Editorially move existing Section 680.27 of the 2002 NEC to Section 680.28.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

HIRSCH: The submitter did not participate in the balanced task group to develop the requirements for an equipotential plane as assigned by the chairman of CMP-20. The submitter did not provide adequate technical substantiation that this solution is appropriate. The proposal contains language that is not acceptable by the NEC Style of Manual.

Sequence Number 17-125 is not used.

17-126 Log #1583 NEC-P17 (680-27(A)(2)) **Final Action: Accept**

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 5 for information.

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

Revise Section 680.27(A)(2) as follows:

(2) Wiring Methods. Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper ~~equipment grounding conductor~~ shall be installed in this conduit. The bonding jumper ~~eequipment grounding conductor~~ shall be terminated in the forming shell and the junction box. The termination of the 8 AWG bonding jumper ~~equipment grounding conductor~~ in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect such connection from the possible deteriorating effect of pool water.

Substantiation:

The revision as proposed would provide consistency with the use of grounding and bonding terms that parallel those defined terms in other sections of the NEC and Article 100. In these installations there are there components of the grounding and bonding scheme that all provide different roles. The conductor used to connect the metal speaker forming shell to the deck box would be a bonding jumper by definition and is sized based on the sizing requirement specific to this section (8 AWG copper minimum). Equipment grounding conductors as used throughout the NEC perform a different function in the grounding scheme and general are sized based on an overcurrent device. This is an underwater audio speaker circuit which originates at audio equipment and is a limited energy circuit.

A 8 AWG solid copper conductor that is a bonded to the speaker forming shell on the outside to connect the outside of the forming shell to the common bonding grid in accordance with 680.26(B)(2).

The 8 AWG copper conductor installed in the nonmetallic raceway to the forming shell performs as a bonding jumper to bond the metal forming shell to the junction box for the underwater audio speaker metal forming shell.

It appears that the appropriate term for the conductor in the raceway between the forming shell and the deck box would be "bonding jumper" and would be consistent with that defined term in Article 100. The revision would promote uniform use of these terms that is consistent in other articles and sections of the NEC.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-127 Log #1993 NEC-P17 **Final Action: Accept in Principle**
(680-27(A)(2))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(2) Wiring Methods. Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper equipment ~~grounding~~ bonding conductor shall be installed in this conduit. The equipment ~~grounding~~ bonding conductor shall be terminated in the forming shell and the junction box. The termination of the 8 AWG equipment ~~grounding~~ bonding conductor in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect such connection from the possible deteriorating effect of pool water.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Accept in Principle

Panel Statement:

The panel recognizes that the word grounding must be changed to bonding but the more correct term is bonding jumper rather than bonding conductor. See panel action on Proposal 17-126.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-128 Log #2125 NEC-P17 **Final Action: Accept**
(680-27(A)(2))

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 5 for information.

Submitter: L. Keith Lofland, International Association of Electrical Inspectors

Recommendation:

Revise Section 680.23(B)(2)(b) to read as follows:
(2) Wiring Methods. Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or lqiuidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper ~~equipment grounding conductor~~ shall be installed in this conduit. The bonding jumper ~~equipment grounding conductor~~ shall be terminated in the forming shell and the junction box. The termination of the 8 AWG bonding jumper ~~equipment grounding conductor~~ in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect such connection from the possible deteriorating effect of pool water.

Substantiation:

The revision as proposed would provide consistency with the use of grounding and bonding terms that parallel those defined terms in other sections of the NEC and Article 100. In these installations, there are three components of the grounding and bonding scheme that all provide different roles. The conductor used to connect the metal speaker forming shell to the deck box would be a bonding jumper by definition and is sized based on the sizing requirement specific to this section (8 AWG copper minimum). Equipment grounding conductors as used throughout the NEC perform a different function in the grounding scheme and generally are sized based on an overcurrent device. This is an underwater audio speaker circuit, which originates at audio equipment and is a limited energy circuit.
There is a bonding jumper that is a part of the bonding system and is a 8 AWG solid copper conductor that is connected to the outside of the speaker forming shell to the common bonding grid in accordance with 680.26(B)(2).
The 8 AWG copper conductor installed inside the nonmetallic raceway to the speaker forming shell, that is now being called an equipment grounding conductor performs as a bonding jumper to bond the metal shell to the junction box for the underwater speaker. It would seem that the appropriate term for this conductor installed inside the raceway between the speaker forming shell and the deck box would be "bonding jumper" and would be consistent with that defined term in Article 100.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-129 Log #2674 NEC-P17 **Final Action: Accept in Principle**
(680-27(A)(2))

Submitter: Phil Simmons, Simmons Electrical Services

Recommendation:

Revise existing Section 680.27(A)(2) as follows:
(2) Wiring Methods. Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding ~~equipment grounding~~ conductor shall be installed in this conduit. The bonding ~~equipment grounding~~ conductor shall be terminated in the forming shell and the junction box. The termination of the 8 AWG bonding ~~equipment grounding~~ conductor in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect such connection from the possible deteriorating effect of pool water.

Substantiation:

The use of the term "equipment grounding conductor" in this subsection seems to be in error. Equipment grounding conductors are sized in accordance with 250.122 based on the rating of the overcurrent on the supply side of the circuit. There is no overcurrent protection of these audio conductors so there could be no correct reference to Table 250.122. In this case, an 8 AWG conductor is mandated for reasons other than for its ability to carry fault current to facilitate the operation of an overcurrent device on the line side of the circuit. This proposal will return the language to that of the 1999 and earlier editions of the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

The panel recognizes that the word "grounding" must be changed to "bonding" but the more correct term is "bonding jumper" rather than "bonding conductor." See panel action on Proposal 17-126.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-130 Log #2700 NEC-P17 **Final Action: Reject**
(680-27(A)(2))

Submitter: George Straniero, AFC Cable Systems

Recommendation:

Revise text to read:
Revise 680.27(A)(2) to add liquidtight flexible metal conduit.
(2) Wiring Methods. Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), liquidtight flexible metal conduit, or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper equipment grounding conductor shall be installed in this conduit. The equipment grounding conductor shall be terminated in the forming shell and junction box. The termination of the 8 AWG equipment grounding conductor in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect such connection from the possible deteriorating effect of pool water.

Substantiation:

The overall PVC covering of liquidtight flexible metal conduit provides corrosion and mechanical protection equal to LFNC-B. It should be included as a permitted wiring method.

Panel Meeting Action: Reject

Panel Statement:

Liquidtight metal conduit does not have the same corrosion resistant properties as the other wiring methods allowed in this section.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-131 Log #3007 NEC-P17 **Final Action: Accept in Principle**
(680-27(A)(2))

Submitter: Donald R. Offerdahl, North Dakota State Electrical Board

Recommendation:

Revise text as follows:
(2) Wiring Methods. Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper equipment ~~grounding~~ bonding conductor shall be installed in this conduit. The equipment ~~grounding~~ bonding conductor shall be terminated in the forming shell and the junction box.

Substantiation:

Need to provide proper terminology of this conductor, which is a bonding conductor not a grounding conductor.

Panel Meeting Action: Accept in Principle

Panel Statement:

The panel recognizes that the word "grounding" must be changed to "bonding" but the more correct term is "bonding jumper" rather than "bonding conductor." See panel action on Proposal 17-126.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-132 Log #1994 NEC-P17 **Final Action: Reject**
(680-31)

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
680.31 Pumps. A cord-connected pool filter pump shall incorporate an approved system of double insulation or its equivalent and shall be provided with means for grounding only the internal and nonaccessible non–current-carrying metal parts of the appliance.
The means for grounding shall be an equipment ~~grounding~~ bonding conductor run with the power-supply conductors in the flexible cord that is properly terminated in a grounding-type attachment plug having a fixed grounding contact member.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-132a Log #CP1701 NEC-P17 **Final Action: Accept**
(680-32)

Submitter: Code-Making Panel 17

Recommendation:

Add the following to 680.32 to read as follows:
"All 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a storable pool shall be protected by a ground-fault circuit interrupter. Receptacles that supply pool pump motors and that are rated 15 or 20 amperes, 125 volts through 250 volts, single phase, shall be provided with GFCI protection. In determining the above dimensions, the distance to be measured shall be the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other effective permanent barrier."

Substantiation:

This panel proposal addresses inadvertent omission during the 2002 NEC Article 680 rewrite that did not include any location requirement for storable pool receptacles.
Two additional sentences are existing requirements in 1999 NEC® Section 680-6(a)(3) and FPA applicable to storable pools (as well as permanently installed pools)

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-132b Log #CP1712 NEC-P17 **Final Action: Accept**
(680-34 (New))

Submitter: Code-Making Panel 17

Recommendation:

Add a new Section 680.34 to read as follows:
680.34 Receptacle Locations. Location of receptacles that provide power for storable pool pump motors or other loads directly related to the circulation and sanitation system shall be located at least 3.0 meters (10 ft) from the inside walls of the pool. Other receptacles shall not be less than 3.0 m (10 ft) from the inside walls of a pool. In determining the above dimensions, the distance to be measured shall be the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other effective permanent barrier.

Substantiation:

This panel proposal addresses inadvertent omission during the 2002 NEC Article 680 rewrite that did not include any location requirement for storable pool receptacles. Additional language was added for usability and enforcement.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-133 Log #1491 NEC-P17 **Final Action: Reject**
(680-41)

Submitter: Bob Vodicka, Encompass Electrical Technology, Rocky Mountain Area

Recommendation:

Revise text to read as follows:
680.41 Emergency Switch for Spas and Hot Tubs.
A clearly labeled emergency shutoff or control switch for the purpose of stopping the motor(s) that provide power to the recirculation system and jet system shall be installed at a point readily accessible to the user and 1.5 m (5 ft) or greater away, adjacent to, and within sight of the spa or hot tub. This requirement shall not apply to single family dwellings.

Substantiation:

It won't be misleading and will be more user friendly when written this way. New writing also complies with NEC Style Manual.

Panel Meeting Action: Reject

Panel Statement:

The proposed change does not improve the understanding and usage of the requirements.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-134 Log #1683 NEC-P17 **Final Action: Reject**
(680-42(A)(1))

Submitter: James M. Imlah, City of Hillsboro,OR / Rep. Oregon Chapter IAEI

Recommendation:

Revise text as follows:
680.42(A)(1) Flexible Conduit: Liquidtight flexible metal conduit or liquidtight flexible nonmetallic shall be permitted ~~in lengths of not more than 1.8 m 6 ft)~~.

Substantiation:

Larger spas and hot tubs need more length to connect the appliance. Flexible metallic and flexible nonmetallic conduit must still contain an insulated equipment conductor as per 680.42(C). The installation still must comply with Article 350.12 and 356.12 where subject to physical damage. Article 680.21(A)(3) does not restrict the maximum length.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on proposal 17-135.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

HUTCHINGS: The Panel's Statement implies that the six foot limitation applies only to the unsupported portion of the flexible metal conduit. 680.42(A)(d) clearly limits the overall length of LFMC to 6 ft. This is overly restrictive and should be relaxex.

17-135 Log #3043 NEC-P17 **Final Action: Reject**
(680-42(A)(1))

Submitter: Daniel J. Thompson, Diamond T. Electrical

Recommendation:

Revise text as follows:
Liquidtight flexible metal conduit or liquidtight flexible nonmetallic conduit shall be permitted in lengths of not more than ~~1.8 m (6 ft)~~ 3.6 m (12 ft.) and shall comply with the requirements of 350.60.

Substantiation:

Entrance into the spa or hot tub to make a raceway connection to the control panel can sometimes require more than 6 ft to get to the control panel. Increasing the allowable length from 6 ft to 12 ft would allow greater flexibility for raceway access and installation.
Spa and hot tub sales and installation companies have made several complaints to our company for leniency on length for the reasons listed in this proposal. Any junctions which may have to be made inside the spa or hot tub would be eliminated; wire and raceway; both.
This would allow we, the installers of raceway and power, greater flexibility as far as access into the spa, additional cost savings on material because of the elimination of the need for junctions, and increased productivity because of labor savings not making any junctions.
We feel that 12 ft (3.6 m) will be a sufficient length for almost any connection to the hot tub or spa control panel.
Note: Supporting Material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement:

The six foot unsupported length is sufficient for flexibility. Fixed wiring methods in accordance 680.21(A) should be applied for distances beyond the six feet flexible connection.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

HUTCHINGS: See my Explanation of Negative Vote on Proposal 17-134.

17-136 Log #1700 NEC-P17 **Final Action: Reject**
(680-42(B))

Submitter: Gregory L. Olson, Public Service Electric & Gas Company

Recommendation:

Revise text as follows:
(B) Bonding. All metallic parts of the hot tub structure, including the reinforcing metal of the hot tub shell, coping stones, and deck, shall be bonded in accordance to 680.26 that would otherwise also apply to pools installed outdoors. Bonding by metal-to-metal mounting on a common frame or base shall be permitted. The metal bands or hoops used to secure wooden staves shall not be required to be bonded as required in 680.26.

Substantiation:

Numerous instances have been encountered where voltage gradients have been found to exist between a properly grounded and bonded packaged or self-contained spa or hot tub and the concrete or paver stone surface upon which it is installed. Investigations of such conditions typically reveal that the concrete or paver stone surface has not been bonded to the spa or hot tub equipment. Consideration of a spa or hot tub as a variation of a permanently installed swimming pool would suggest that the same grounding and bonding practices apply. However, the requirements to properly bond the reinforcing metal of a deck surface when installing a spa or hot tub is not explicit enough in the code.

Panel Meeting Action: Reject

Panel Statement:

Since this is an outdoor location, it is already covered in 680.26.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-137 Log #1995 NEC-P17 **Final Action: Reject**
(680-42(C))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(C) Interior Wiring to Outdoor Installations. In the interior of a one-family dwelling or in the interior of another building or structure associated with a one-family dwelling, any of the wiring methods recognized in Chapter 3 of this Code that contain a copper equipment ~~grounding~~ bonding conductor that is insulated or enclosed within the outer sheath of the wiring method and not smaller than 12 AWG shall be permitted to be used for the connection to motor, heating, and control loads that are part of a self-contained spa or hot tub, or a packaged spa or hot tub equipment assembly. Wiring to an underwater light shall comply with 680.23 or 680.33.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-138 Log #1335 NEC-P17 **Final Action: Reject**
(680-42(D) (New))

Submitter: Mark T. Rochon, Mark J. Rochon Master Electrician

Recommendation:

Add a new section to read as follows:
680.42(D) Receptacles at least one 125-volt, 15- or 20-ampere receptacle on a general-purpose branch circuit shall be located not less than 1.5 m (5 ft) from and not exceeding 3.0 m (10 ft) from the inside wall of spa or hot tub and installed in accordance with 210.8(A)(3).

Substantiation:

Extension cords outside with or without GFCI protection, rolled up near tubs, 50 ft to 100 ft long for radius, refrigerator, and the like. Trip hazard and ground fault hazard are present.

Panel Meeting Action: Reject

Panel Statement:

Section 680.42 requires compliance with Part II of this Article. Section 680.22(A) covers the location and requirement for receptacles.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-139 Log #2302 NEC-P17 **Final Action: Accept in Principle**
(680-42(D) (New))

Submitter: Joseph A. Ross, Ross Seminars

Recommendation:

Add a new (D) as follows:
(D) Electrically heated Floors or Decks. Electrically heated floors or decks shall be permitted according to the provisions of 424.44(G).
[Or alternatively, delete "spa and hot tub" from 424.44(G).]

Substantiation:

According to 90.3 of the 2002 NEC, Chapter 6 (680.42) amends Chapter 4 [424.44(G)] and prohibits "radiant heating cables" to be embedded in or below a deck at a spa or hot tub location. A spa or a hot tub must comply with the provisions of Parts I and II of Article 680. See 680.27(C)(3) of Part II of Article 680.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-38.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-140 Log #2303 NEC-P17 **Final Action: Accept in Principle**
(680-43 Exception No. 2 (New))

Submitter: Joseph A. Ross, Ross Seminars

Recommendation:

Number the existing Exception as Exception No. 1 and add a new Exception No. 2 as follows:
Exception No. 2: Electrically heated floors or decks shall be permitted according to the provisions of 424.44(G).
[Or alternatively, delete "spa and hot tub" from 424.44(G).]

Substantiation:

According to 90.3 of the 2002 NEC, Chapter 6 (680.43) amends Chapter 4 [424.44(G)] and prohibits "radiant heating cables" to be embedded in or below a deck at a spa or hot tub location. A spa or hot tub must comply with the provisions of Parts I and II of Article 680. See 680.27(C)(3) of Part II of Article 680.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement on Proposal 17-38.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-141 Log #1701 NEC-P17 **Final Action: Reject**
(680-43(D))

Submitter: Gregory L. Olson, Public Service Electric & Gas Company

Recommendation:

Revise text as follows:
(D) Bonding. All metallic parts of the hot tub structure, including the reinforcing metal of the hot tub shell, coping stones, and deck, shall be bonded in accordance to 680.26 that would otherwise also apply to pools installed outdoors. Bonding by metal-to-metal mounting on a common frame or base shall be permitted. The metal bands or hoops used to secure wooden staves shall not be required to be bonded as required in 680.26. In addition to the requirements of 680.26, ~~T~~the following parts shall be bonded together:
(1) All metal fittings within or attached to the spa or hot tub structure
(2) Metal parts of electrical equipment associated with the spa or hot tub water circulating system, including pump motors
(3) Metal conduit and metal piping that are within 1.5 m (5 ft) of the inside walls of the spa or hot tub and that are not separated from the spa or hot tub by a permanent barrier
(4) All metal surfaces that are within 1.5 m (5 ft) of the inside walls of the spa or hot tub and that are not separated from the spa or hot tub area by a permanent barrier
Exception: Small conductive surfaces not likely to become energized, such as air and water jets and drain fittings, where not connected to metallic piping, towel bars, mirror frames, and similar nonelectrical equipment, shall not be required to be bonded.
(5) Electrical devices and controls that are not associated with the spas or hot tubs and that are located not less than 1.5 m (5 ft) from such units; otherwise they shall be bonded to the spa or hot tub system

Substantiation:

Numerous instances have been encountered where voltage gradients have been found to exist between a properly grounded and bonded packaged or self-contained spa or hot tub and the concrete or paver stone surface upon which it is installed. Investigations of such conditions typically reveal that the concrete or paver stone surface has not been bonded to the spa or hot tub equipment. Consideration of a spa or hot tub as a variation of a permanently installed swimming pool would suggest that the same grounding and bonding practices apply. However, the requirements to properly bond the reinforcing metal of a deck surface when installing a spa or hot tub is not explicit enough in the code.

Panel Meeting Action: Reject

Panel Statement:

The substantiation is not sufficient to change the present requirement for indoor applications.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-142 Log #654 NEC-P17 **Final Action: Accept**
(680-43(D)(3), and (E))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise text to read as follows:
(D)(3) Metal~~-conduit~~ raceways, metal-enclosed cables, and metal piping that are..." (remainder unchanged).
(E) Methods of Bonding. All metal parts~~-associated with the spa or hot tub~~ required to be bonded by (D) shall be bonded by any of the following methods:
(1) No change.
(2) No change.
(3) The provisions of a solid copper bonding jumper, insulated, covered, or bare, not smaller than 8 AWG. ~~Solid~~.

Substantiation:

The word "conduit" does not cover metal wiring methods such as EMT, Type AC, MC, or MI cables. The phrase "associated with the spa" doesn't apply the methods of bonding to metal raceways, cables, piping, or other metal surfaces where they are not associated with the spa. Present syntax of (D)(3) doesn't specifically require a solid conductor, only one not smaller than 8 AWG solid. A stranded copper 8 AWG is not smaller than solid 8 AWG copper and is larger in diameter; it complies with the literal wording, if not the intent.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-143 Log #42 NEC-P17 **Final Action: Accept in Principle**
(680-51)

NOTE: The following proposal consists of Comment 20-35 on Proposal 20-30a in the 2001 May Meeting National Electrical Code Committee Report on Proposals. This comment was held for further study during the processing of the 2002 NATIONAL ELECTRICAL CODE. The recommendation in Proposal 20-30a was:
Editorially revise Article 680 to read as follows:

[Text of (May 2001) Proposal 20-30a is shown on page 2660]

INSERT Table 680 HERE
cross-references between '99 code
and '02 code.

Submitter: Robert E. Wisenburg, Coates Heater Co., Inc. / Rep. National Spa & Pool Institute

Recommendation:

Revise text as follows:
(A) Ground-Fault Circuit Interrupters. Fountain equipment unless listed for operation at 15 volts or less and supplied by a transformer that complies with 680.25(A)(2), shall be protected by a ground-fault circuit interrupter except as noted.
Electric heaters used for freeze protection shall meet the requirements of 680.9 and 680.26(E).

Substantiation:

Electric swimming pool heaters are often used to provide freeze protection for fountains. These heaters may be as large as 100 kW or more and are most often three phase and may be 480 volt. GFCI protection is not available for these units and they should be treated like swimming pool heaters.

Panel Meeting Action: Accept in Principle

Revise text as follows:
(A) Ground-Fault Circuit-Interrupters. Luminaires (lighting fixtures), submersible pumps, and other submersible equipment, unless listed for operation at 15 volts or less and supplied by a transformer that complies with 680.25(A)(2), shall be protected by a ground-fault circuit interrupter.

Panel Statement:

The revised text will eliminate the confusion that fountain heaters might be interpreted to require GFCI protection.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-144 Log #1123 NEC-P17 **Final Action: Reject**
(680-52(B)(2)(a))

Submitter: Carlos Bascas, Hobbs Architectural Fountains

Recommendation:

Underwater enclosures shall be filled with a potting compound, approved by the manufacturer of the underwater enclosure, to prevent the entry of moisture.

Substantiation:

On the original statement "Underwater enclosures shall be filled with an approved potting compound to prevent the entry of moisture.", the approving authority is not defined. Because fountains are a specialty, companies that specialize in this field should define what type of potting compounds are acceptable. Two-part reenterable compounds are common, but parrafin wax is often used as a reenterable potting compound. Parrafin wax is an economical means to pot an underwater box, but the negative aspect of parrafin wax is that it is not applied correctly a great deal of the time. And since parrafin wax is mainly marketed for the canning industry, the electrician does not have potting instructions for using parrafin wax.

Panel Meeting Action: Reject

Panel Statement:

The authority having jurisdiction shall be the approving authority. It is usually an electrical inspector. See Article 100, Definitions for further information.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-145 Log #1124 NEC-P17 **Final Action: Accept in Part**
(680-52(B)(2)(b))

Submitter: Carlos Bascas, Hobbs Architectural Fountains

Recommendation:

Where the junction box is supported only by the conduit, the conduit shall be of stainless steel, brass, or other approved corrosion-resistant metal.

Substantiation:

In the recommended sentence, the words "stainless steel" replaced the word "copper". The wall thickness of copper tubing is too thin be be used as an exposed conduit in an underwater application. Fountains are always being treated with algaecides, chlorine, brominine, and muriatic acid (for lowering the pH level of the pool water). The conduit used for the junction box support is actually piping. The term for the thickest copper piping is type "K" copper tubing, which has a wall thickness of 0.65" for sizes 3/4" and 1". Schedule 40 (standard and most common schedule of piping) stainless steel and brass pipe have a wall thickness of 0.113" for 3/4" pipe, and 0.133" for 1" pipe.

Panel Meeting Action: Accept in Part

Revise the second sentence of 680.52(B)(2)(b) in the code by adding the words "stainless steel," after the word "brass,".

Panel Statement:

The submitter has not provided evidence to indicate that copper has created a hazard.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-146 Log #1996 NEC-P17 **Final Action: Reject**
(680-53)

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
680.53 Bonding. All metal piping systems associated with the fountain shall be bonded to the equipment ~~grounding~~ bonding conductor of the branch circuit supplying the fountain.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-147 Log #1997 NEC-P17 **Final Action: Reject**
(680-55(B))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(B) Supplied by a Flexible Cord. Electrical equipment that is supplied by a flexible cord shall have all exposed non–current-carrying metal parts grounded by an insulated copper equipment ~~grounding~~ bonding conductor that is an integral part of this cord. The ~~grounding~~ bonding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure, or other enclosure.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 17-1.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

Comment on Affirmative:

CRIVELL: See my Comment on Affirmative for 17-1.

17-148 Log #1084 NEC-P17 **Final Action: Accept in Principle**
(680-57(B))

Submitter: Russell LeBlanc, Peterson School of Engineering

Recommendation:

Revise:
(B) Ground-Fault Circuit-Interrupter Protection for Personnel. All circuits supplying signs (within fountains or within 5 ft of fountains) shall have ground-fault circuit-interrupter protection for personnel.

Substantiation:

The current wording requires GFCI protection even for a fixed sign installed anywhere adjacent to a fountain. No dimension is given as to when GFCI protection would not be needed for a fixed sign near a fountain. According to 680.57(A) the GFCI requirements in 680.57(B) apply to signs within or adjacent to fountains.

Panel Meeting Action: Accept in Principle

Revise 680.57(A) in the code to read.
(A) General. This section covers electric signs installed within a fountain or within 3.0 m (10 ft) of the fountain edge.

Panel Statement:

This change makes the requirement similar to that for pools and is meant to meet the intent of the submitter.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-149 Log #1712 NEC-P17Meeting Action: Accept in Principle in Part (680-58 (New)) **Final Action: Reject**

TCC Action: Reject

The Technical Correlating Committee understands that the Panel Action is to "Accept in Principle" the proposed first sentence based on the action on Proposal 17-150, and to "Reject" the proposed second sentence.

Submitter: Lawrence S. Cross, Burlington County Institute of Technology

Recommendation:

Add new section to Article 680.
680.58 GFCI Protection. All 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a fountain shall be protected by a ground-fault circuit interrupter. Receptacles that supply fountain pump motors and that are rated 15 or 20 amperes, 120 volt through 240 volts, single phase, shall be provided with GFCI protection.

Substantiation:

The above text is editorially revised (from existing 680.22(A)(5)) to limit the application of this new requirement to fountains. In the rewrite of Article 680 last cycle (great rewrite) this requirement was moved from Part A "General" into Part II "Permanently Installed Pools."
Presently, as per 680.50 this GFCI requirement does not apply to fountains. The requirement as written in the 1999 NEC for receptacles within 20-ft was inadvertently omitted in the rewrite.
This requirement which was located in "Part "A" General" of Article 680 in 1999 applied to all of the equipment referenced in Article 680. This requirement must now be added to "Part "V" Fountains" of the 2002 NEC for continued protection of persons near fountains.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See action on Proposal 17-150. The requirement of the last sentence in the proposal is now covered by 680.51(A) for submersible pumps. The submitter has not provided any substantiation to expand the requirements to pumps of other than the submersible types.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-150 Log #3083 NEC-P17 (680-58 (New)) **Final Action: Accept in Principle**

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Mass Electrical Code Adv. Committee

Recommendation:

Add new text to read as follows:
680.58 GFCI Protection for Adjacent Receptacle Outlets. All 15- or 20-ampere single-phase 125-volt receptacles located within 6.0 m (20 ft) of a fountain shall be provided with GFCI protection.

Substantiation:

This is a companion proposal to one addressing 680.22(A)(5). It properly locates a fountain requirement in Part V of the article. The proposal also moderates the scope of the rule to cover circuit amperages traditionally targeted for GFCI restrictions, including throughout Article 680.

Panel Meeting Action: Accept in Principle

Add new text to read as follows:
680.58 GFCI Protection for Adjacent Receptacle Outlets. All 15- or 20-ampere single-phase 125-volts through 250-volts receptacles located within 6.0 m (20 ft) of a fountain edge shall be provided with GFCI protection.

Panel Statement:

The panel added 250-volt receptacles to increase the safety requirements. The panel added "edge" to be more definitive.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-151 Log #2710 NEC-P17 **Final Action: Reject**
(680-62(B)(5))

Submitter: Donny Cook, Shelby County Development Services

Recommendation:

Revise text to read as follows:
(5) Electrical devices and controls that are not associated with the therapeutic tubs and located within 1.5 m (5 ft.) from such units.

Substantiation:

Current text would require all electrical devices that are not associated with the therapeutic tub and located more than 1.5 m (5 ft.) from the unit to be bonded. It would also allow electrical devices not associated with the therapeutic tub to be less than 5 ft. from the tub and not be bonded. Prior to the rewrite of Article 680, these items were required to be located more than 5 ft. or be bonded. I do not see any substantiation to bond devices located more than 5 ft. away and not bond the devices within 5 ft.

Panel Meeting Action: Reject

Panel Statement:

An errata was issued to correct the wording of this section for the first edition.
The correct wording is as follows:
680.62(B)(5) Electrical devices and controls that are not associated with the therapeutic tubs and that are not located a minimum of 1.5 m (5 ft) from such units.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-152 Log #1524 NEC-P17 **Final Action: Reject**
(680-74)

Submitter: Gary Siggins, Underwriters Laboratories Inc.

Recommendation:

Delete from 680.74 the following text: "and providing a means for grounding internal nonaccessible, non-current carrying metal parts."

Substantiation:

The bonding exception for equipment with an approved system of double insulation if they ground internal nonaccessible, non-current carrying metal parts is the same as for swimming pool pumps. The pump designs are different. Double insulted hydromassage bathtub pumps utilize double insulated motors where swimming pool pumps utilize grounded motors with outer plastic covers. Also a hydromassage bathtub pump is not accessible to the tub occupant. Forcing them to ground the pump would violate the requirements used to evaluate the motors in UL 1097, "Double Insulation Systems for Use in Electrical Equipment."

Panel Meeting Action: Reject

Panel Statement:

See the submitter's substantiation on Proposal 17-153. The panel believes that a field installed double insulated motor equipped with a three-wire cord incorporating an equipment grounding conductor provides an increased level of safety.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-153 Log #3079 NEC-P17 (680-74) **Final Action: Accept**

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

Recommendation:

Add the following sentence:
The means for grounding internal nonaccessible, non-current carrying metal parts shall be an equipment grounding conductor run with the power-supply conductors in the case of units supplied with a flexible cord, or a grounding terminal in the case of units intended for permanent connection.

Substantiation:

The present version of UL 1795, as reflected in the general information for Guide Card NCHX, clearly permits hydromassage bathtubs to be manufactured with nongrounding plug configurations. This is inconsistent with the long history of DI procedures in this article. See, for example 680.31. It is also inconsistent with a close reading of this section. The DI motors, per listing instructions at NCHX, are forbidden to be bonded (and properly so). However, 680.74 only removes the bonding requirement on a showing of a means for grounding internal, noncurrent-carrying metal parts. A motor with a two-wire cord has no means for grounding such parts. Therefore, by the process of elimination as applied to 680.74, it must be bonded. But it would violate 110.3(B) (and important safety considerations) if a field bonding connection were made. Catch 22.

The language in 680.74 clearly was taken from 680.31 and intended to be in the same spirit. This proposal will force a revision in UL 1795 so that these motors are equipped with 3-wire cords (or a grounding connection if the manufacturer chose to provide for a permanent connection). This proposal does not require the cord-and-plug connection (as in the case of 680.31) but it might be entertained by Code-Making Panel 17. A grounding terminal in the same vicinity as power connections may defeat the safety objectives of the DI system, but the testing laboratories should probably be the judges of that. DI hydromassage pump motors are in routine production with no provisions for grounding the internal, inaccessible parts. An internal failure would produce the same hazards as an outdoor storable pool unit, given the proximity of grounded, wet surfaces. If Code-Making Panel17 actually intends that two-wire connections are permissible, then it should originate a panel proposal to rewrite this section to remove the conundrum just demonstrated in the previous paragraph.

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

17-154 Log #1625 NEC-P17 **Final Action: Accept**
(682 (New))

TCC Action:

The Technical Correlating Committee directs that the new article be numbered as Article 682. The Technical Correlating Committee advises that assignment of new Articles and Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Accepts" the Panel Action. It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a Public Comment. It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 19 for information.

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company

Recommendation:

Insert a new Article in NFPA 70 covering electrical installations for "Natural and Artificially Made Bodies of Water".

Article 6xx

Natural and Artificially Made Bodies of Water

I. General

6xx.1 Scope. This article applies to the installation of electrical wiring for and equipment in and adjacent to natural or artificially made bodies of water not covered by other articles of this *Code*, such as, but not limited to Aeration Ponds, Fish Farm Ponds, Storm Retention Basins, Sewage Treatment Ponds, Irrigation (Channels) Facilities.

6xx.2 Definitions.

Natural Bodies of Water. Bodies of water such as lakes, streams, ponds, rivers or other naturally occurring bodies of water, and which may vary in depth throughout the year.

Artificially Made Bodies of Water. Bodies of water that have been constructed or modified to fit some decorative or commercial purpose such as, but not limited to Aeration Ponds, Fish Farm Ponds, Storm Retention Basins, Sewage Treatment Ponds, Irrigation (Channels) Facilities. Water depth may vary seasonally or be controlled.

Electrical Datum Plane. The electrical datum plane as used in this Article is defined as follows:

(1) In land areas subject to tidal fluctuation, the electrical datum plane is a horizontal plane 606 mm (2 ft) above the highest tide level for the area occurring under normal circumstances, i.e., highest high tide.

(2) In land areas not subject to tidal fluctuation, the electrical datum plane is a horizontal plane 606 mm (2 ft) above the highest water level for the area occurring under normal circumstances.

(3) In land areas subject to flooding, the electrical datum plane based on (1) or (2) above is a horizontal plane 606 mm (2 ft) above the point identified as the prevailing high water mark or an equivalent benchmark based upon seasonal or storm-driven flooding from the authority having jurisdiction.

(4) The electrical datum plane for floating structures and landing stages that are (1) installed to permit rise and fall response to water level, without lateral movement, and (2) that are so equipped that they can rise to the datum plane established for (1) or (2) above, is a horizontal plane 762 mm (30 in.) above the water level at the floating structure or landing stage and a minimum of 305 mm (12 in.) above the level of the deck.

6xx.3. Other Articles. Wiring and equipment in or adjacent to natural or artificially made bodies of water shall comply with the applicable provisions of other articles of this *Code*, except as modified by this article.

II. Installation

6xx.10 Electrical Equipment and Transformers. Electrical equipment and transformers including their enclosures shall be specifically approved for the intended location. The bottom of enclosures for electrical equipment and transformers shall not be located below the electrical datum plane.

6xx.11 Location of Service Equipment. On land, the service equipment for floating structures and submersible electrical equipment shall be located no closer than 1.5 m (5 ft) from the edge of the electrical datum plane.

6xx.12 Electrical Connections. All electrical connections shall be located at least 305 mm (12 in.) above the deck of a floating or fixed structure, but not below the electrical datum plane.

6xx.13 Wiring Methods and Installation. Wiring methods and installations of Chapter 3 and Articles 527, 553 and 555 shall be permitted where identified for use in wet locations.

6xx.14 Disconnecting Means for Submersible or Floating Power Connection(s). Disconnecting means shall be provided to isolate each submersible or floating electrical equipment from its supply connection(s).

(A) Type. The disconnecting means shall be permitted to consist of a circuit breaker, switch, or both, and shall be properly identified as to which receptacle it controls.

(B) Location. The disconnecting means shall be readily accessible on land, located not more than 762 mm (30 in.) from the receptacle it controls, and shall be located in the supply circuit ahead of the receptacle. The disconnecting means shall be located within sight from the shoreline and not closer than 1.5 m (5 ft) from the edge of the shoreline based on the electrical datum plane.

6xx.15 Ground-Fault Circuit-Interrupter (GFCI) Protection for Personnel.

Fifteen- and 20-ampere, single-phase, 125-volt receptacles installed outdoors and in or on floating buildings or structures within the electrical datum plane area that are used for storage, maintenance, or repair where portable electrical hand tools, electrical diagnostic equipment, or portable lighting equipment are to be used, shall be provided with GFCI protection for personnel.

III. Grounding and Bonding

6xx.30 Grounding. Wiring and equipment within the scope of this article shall be grounded as specified in Articles 250, 553 and 555 and with the requirements in this Part III.

6xx.31 Equipment Grounding.

(A) Electrical Systems. All enclosures and exposed metal parts of electrical systems shall be bonded to the grounding bus in the panel board.

(B) Cord-Connected Appliances. Where required to be grounded, cord-connected appliances shall be grounded by means of an equipment grounding conductor in the cord and a grounding-type attachment plug.

6xx.32 Bonding of Noncurrent-Carrying Metal Parts. All metal parts in contact with the water, all metal piping, tanks, and all noncurrent-carrying metal parts that may become energized, shall be bonded to the grounding bus in the panelboard.

Substantiation:

This proposal is the result of the NEC CMP-17 Task Group on Other Bodies of Water. This Task Group is from an action of the 2002 NEC CMP-20's direction to investigate the need of a new article to cover the types of installations that include bodies of water involving electrical equipment not covered by Article 680 in the NEC. The direction is referenced in NEC May 2001 ROC Comments 20-12 and 13 and NEC May 2001 ROP Proposals 20-32 and 34. Further, this change also refers to 1996 NEC CMP-20's Panel Statement in their rejection of NFPA 70 A95 ROP Proposal 20-53 for 1993 NEC Section 680-4 to include ponds indicated in part:
"Storm retention basins, sewage treatment ponds, and similar bodies of water are not covered under the scope of Article 680. It would be impractical to require these facilities to comply with Part E of Article 680. The term "pond" is not even referred to in Part E covering fountains."
The limitation of no closer than 1.5 m (5 ft.) from shoreline to service equipment or disconnect location is based on the safety determination evolved in Article 680 and previous CMP-20 actions. It is possible in some instances that the intent for this limitation could be 1.5 m (5 ft.) above the electrical datum plane.
There is a companion proposal for the addition of equipotential plane requirements to mitigate step and touch voltages for persons coming in contact with electrical equipment likely to become energized.
It is anticipated that the assignment of the Article number and the Article's scope is under the purview of the NEC Technical Correlating Committee.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

Comment on Affirmative:

JOHNSON: The following affirmative comment adds clarity to the Proposal 17-154 (682(New)).

6xx.11 Location of Service Equipment. On land the service equipment for floating structures and submersible electrical equipment shall be located no closer than 1.5 m (5 ft) form the water's edge and live parts elevated a minimum of (12 in.) above the electrical datum plane. Service equipment shall disconnect when the water level reaches the height of the established Electrical Datum Plane.

6xx.14 Disconnecting means for Floating Structures or Submersive Electrical Equipment ~~or Floating Power Connection(s).~~

(A) Type. The disconnecting means shall be permitted to consist of a circuit breaker, switch, or both, and shall be properly identified as to which structure ~~receptacle~~ or equipment it controls.

(B) Location. The disconnecting means shall be readily accessible on land~~, located not more than 762 mm (30 in.) from the receptacle it controls,~~ and shall be located in the supply circuit ahead of the structure or equipment connection, ~~receptacle.~~ The disconnecting means shall be located not more than 762 mm (30 in.) ~~within sight~~ from the structure or equipment connection, ~~shoreline and~~ The disconnecting means shall be within sight not closer than 1.5n (5 ft) from the edge of the shoreline and live parts elevated a minimum of (12 in.) above ~~based on~~ the electrical datum plane.

6xx.15 Ground-Fault Circuit-Interrupter (GFCI) Protection for Personnel. GFCI protection shall be located not less than (12 in.) above the established Electrical Datum Plane for all fifteen- and 20- ampere, single-phase 125-volt through 250-volt receptacles located less than (12 in.) above the Electrical Datum Plane installed outdoors and in or on floating buildings or structures within the electrical datum plane area that are used for storage, maintenance, or repair where portable electrical hand tools, electrical diagnostic equipment, or portable lighting equipment are to be used~~, shall be provided with GFCI protection for personnel~~.

Reason.

1. To add clarity and uniformity.

17-155 Log #1626 NEC-P17 **Final Action: Accept**
(682-2–Equipotential Plane (New))

TCC Action:

The Technical Correlating Committee understands that this Proposal further modifies Proposal 17-154. It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 19 for information.

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company

Recommendation:

This is a companion proposal to a new Article in NFPA 70 covering electrical installations for "Natural and Artificially Made Bodies of Water". Add a definition and insert a new section on Equipotential Planes in proposed new Article 6xx.

Add in 6xx.2 Definitions:

Equipotential Plane. An area where wire mesh or other conductive elements are on, embedded in, or placed under the walk surface within 80 mm (3 in.), bonded to all metal structures and fixed nonelectrical equipment that may become energized, and connected to the electrical grounding system to prevent a difference in voltage from developing within the plane.

Insert:

6xx.33 Equipotential Planes and Bonding of Equipotential Planes.

For the purposes of this section, equipotential planes are to mitigate step and touch voltages at electrical equipment.

(A) Areas Requiring Equipotential Planes. Equipotential planes shall be installed adjacent to all outdoor service equipment or disconnecting means that control equipment in or on the water which have a metallic enclosure and controls accessible to personnel and likely to become energized. The equipotential plane shall encompass the area around the equipment a minimum of 900 mm (36 in.) where a person stands and can come in contact with the equipment.

(B) Areas Not Requiring Equipotential Planes. Equipotential planes shall not be required for the controlled equipment supplied by the service equipment or disconnecting means. All circuits providing electric power to the controlled equipment that is accessible to personnel shall have GFCI protection.

(C) Bonding. Equipotential planes shall be bonded to the electrical grounding system. The bonding conductor shall be copper, insulated, covered or bare, and not smaller than 8 AWG. The means of bonding to wire mesh or conductive elements shall be by pressure connectors or clamps of brass, copper, copper alloy, or an equally substantial approved means.

Substantiation:

This proposal is the result of the NEC CMP-17 Task Group on Other Bodies of Water. This is in addition to the action of 2002 NEC CMP-20's direction to investigate the need of a new article to cover the types of installations that include bodies of water involving electrical equipment not covered by Article 680 in the NEC.

The addition of equipotential plane requirements is based on IEEE standards 80 and 142 (excerpts attached) to mitigate step and touch voltages for persons coming in contact with electrical equipment likely to become energized. A typical outdoor 120/240V, 200A service with 3,200A line-ground fault current and 100 ohm-meters moist soil conditions can have step and touch voltages exceeding tolerable levels as per IEEE 80. The likeliness of energization results from the proximity of controlling equipment located near a water body's shoreline.

It is anticipated that the assignment of the Section numbers is under the purview of CMP-17 and NFPA Staff based on acceptance of the companion proposal.

Note: Supporting Material available for review at NFPA headquarters.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

12-89 Log #3468 NEC-P12 (685-1(2)) **Final Action: Reject**

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

Recommendation:

Delete the section in its entirety.

Substantiation:

The National Electrical Code is prescriptive code. To say "where the conditions of maintenance and supervision ensure that only qualified persons service the installation," is a performance requirement. Without prescriptive requirements indicating whether this qualified person is an employee of the owner of the premises or is a separately contracted person and the Authority Having Jurisdiction has a means of verification of the continued employment of the qualified person and whether the qualified person has been verified by the authority having jurisdiction as meeting the definition of a qualified person as shown in the definitions of this Code no prescriptive requirements have been followed.

To permit relaxation of the safety requirements of this Code without establishing a positive guarantee that the safety of persons and property is indisputably assured is a reprehensible act.

Panel Meeting Action: Reject

Panel Statement:

By removing the condition in (2), it will allow other than qualified persons to use the rules in Article 685.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

JONES: I agree with the submitter. The phrase "where the conditions of maintenance and supervision ensure that only qualified persons service the installation" is totally unenforceable. What criterion is required so that the authority having jurisdiction can be assured that a qualified person services the installation? The above phrase appears approximately 50 times throughout the NEC and it appears this does permit a relaxation of safety requirements.

TROUT: The panel action should have been Accept in Principle. The panel should change the recommendation from delete to revise 685.1(2) to read:

(2) The conditions of maintenance and supervision ensure that <u>only</u> qualified persons service the system <u>and where all of the following conditions are met:</u>

<u>a. Verification to the authority having jurisdiction that the qualified person(s) meets the requirements of a qualified person as shown in Article 100.</u>

<u>b. Verification to the authority having jurisdiction as to the continued employment of the designated qualified person(s) or to the continued contractual agreement with a separate entity to provide a qualified person.</u>

<u>c. Establishment of a procedure acceptable to the authority having jurisdiction to assure compliance with a. and b. above.</u>

The Panel Statement should read: The panel believes that the requirements of 685.1(2) are necessary to prevent other than qualified persons from using the rules in Article 685, but agrees with the submitter's substantiation that prescriptive requirements must be established to permit verification by the authority having jurisdiction that will assure compliance with the rules in 685.1(2). The panel action will satisfy the concerns of the submitter.

The panel understands that this is a change in the scope of Article 685 and requests that the Technical Correlating Committee approve the panel action.

Comment on Affirmative:

PRICHARD: Removal of this section would relax the safety requirements of the Code. In the context of this article, it is a condition and deleting it removes all requirements as to the qualifications of persons who will service the system.

12-89a Log #CP1203 NEC-P12 (685.2) **Final Action: Accept**

Submitter: Code-Making Panel 12

Recommendation:

Renumber entire section 685.2 to new 685.3, and renumber the remainder of the Article as appropriate.

Substantiation:

This change was made to comply with the 2001 NEC Style Manual Section 2.2.2.2 reserving 685.2 for definitions.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

12-90 Log #458 NEC-P12 (685-11) **Final Action: Reject**

Submitter: Ronald F. Hustad, The Scotts Company

Recommendation:

I am concerned about a problem which I have researched on the burner switch (BS). After researching a couple of accidents which were discussed at a two day Clever-Brooks Boiler Systems Plus Seminar, for the years of 1990-2000, with this type of switch it could have contributed to some of the accidents.

I traced out a couple of the electrical prints, and noticed a single pole maintain control switch, labeled BS (Burner Switch). With this switch constantly maintained in the on position with the boiler running normal, if there is an interruption with the incoming electrical power (example, electrical storm), the boiler will shut down. Then when the power is resumed without any human interfacing it will restart. If the electric power is interrupted repeatedly there could be a build up of gas in the boiler or possible water hammering.

If this switch was changed out to a normal start (n.o.) and stop (n.c.) button operation with the interlock on the Blower Starter or install a run enable relay, this problem could be avoided.

Substantiation:

Since the change of the economy in the early 90's, and cut back in the labor force, the manning of boilers 24 hours a day or a single shift, has been changed with this type of boiler package to only a daily inspection. When the electrical problem starts,usually the boilers are the last things to be checked. Job safety should be checked first and production equipment and related equipment next.

Due to his findings, I feel this type of interlock should be installed. In the area of NEC Article 685 and maybe Article 430 Part VI and possibly included in NFPA 73B.

NOTE: Supporting Material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement:

This proposal does not comply with Section 4-3.3 of the Regulations Governing Committee Projects as no recommended text was provided for the Panel to consider.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

13-21 Log #2583 NEC-P13 (690-2) **Final Action: Accept**

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise the title of the definition as follows:
Alternating-Current (ac) Module (Alternating-Current Photovoltaic Module).

Substantiation:

Defines the abbreviation for alternating current as ac to match the use of the term throughout Article 690.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-22 Log #2585 NEC-P13 (690-2) **Final Action: Accept**

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 9 for information.

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise as shown:
Inverter Output Circuit. Conductors between the inverter and an ac panelboard for stand-alone systems or the conductors between the inverter and service equipment or other electrical power production source, such as a utility, for electrical production and distribution network.

Substantiation:

Replaces the term "load center" with the term "panelboard" to use the appropriate term as defined in the NEC.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: While load center is not listed in the NEC Style Manual, it is a less restrictive terminology than panelboard. While panelboard is listed in the NEC Style Manual, it excludes equipment other than panelboards. Reference IEEE 100: the Authoritative Dictionary of IEEE Standards Terms. Load center is defined as "a point in which the load for a given area is concentrated." This more general terminology should be retained so that equipment other than panelboards can be used. This proposal should be referred to CMP 9 for information.

13-23 Log #2584 NEC-P13 **Final Action: Accept**
(690-2–Building Integrated Photovoltaics)

TCC Action:

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this proposal and consider the comments expressed in the voting. This action will be considered by the Panel as a public comment.

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new definition:
Building Integrated Photovoltaics. Photovoltaic cells, modules, devices, or material: (1) in direct contact with the outer surface of a building or (2) serving as the outer surface of a building.

Substantiation:

Defines a type of photovoltaic product being installed throughout the country. Listed products are available and more are expected to be commercially available in the future.

Panel Meeting Action: Accept

Add the following new definition:
Building Integrated Photovoltaics. Photovoltaic cells, modules, or devices: (1) in direct contact with the outer surface of a building or (2) serving as the outer surface of a building.

Panel Statement:

The term "material" was removed because it was redundant.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: My notes from the panel meeting recorded the panel action as "accept in principle" with the proposal being reworded as follows:
Add the following new definition:
"Building Integrated Photovoltaics. Photovoltaic cells, modules, or devices, ~~or material~~: (1) in direct contact with the outer surface of a building or (2) serving as the outer surface of a building."

Comment on Affirmative:

ELKINS: Ballot indicates that the panel action was "Accept". I believe this may be a typo, and the actual panel action was "Accept in Principle". Panel action indicated should be corrected.
KOVACIK: Panel action should be accept in principle because the proposal was revised by the panel to delete "material."
Further, the definition could be better stated as: "Building Integrated Photovoltaics. Photovoltaic cells, ~~modules, or~~ devices, modules or modular materials which are integrated into: ~~(1) in direct contact with~~ the outer surface or structure of a building ~~or (2) serving~~ and serve as the outer protective surface of ~~a~~ that buildings.
STAFFORD: There is a lack of clarity when defining modules that are in "direct contact" with the outer surface of a building. The intent of the new definition is recognized, but there will be confusion as to modules mounted upon pedestals as being building integrated installations. Building integrated integrated installations should imply photovoltaic modules that are a part of the building materials.
WOOD: The panel action was Accept in Principle. See Panel Statement.

13-24 Log #3265 NEC-P13 **Final Action: Reject**
(690-4(B) Exception (New))

Submitter: Andrew Bangert, H & H

Recommendation:

Add an exception to 690.4(B) to read as follows:
Exception: Conductors that are integral to the p.v. system and pertain only to the system.

Substantiation:

Often there are times when a relay, controlled by a photoeye, is used to disconnect the inverter AC output from the array. The photoeye circuit comes from the utility panel. This is also true of data logging equipment that are integral with the inverter AC output. This saves two conduits going to the same place.

Panel Meeting Action: Reject

Panel Statement:

Separation required in accordance with Section 690.4(B) is necessary to prevent fire hazard and electric shock to qualified persons who maintain these systems.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-25 Log #2271 NEC-P13 **Final Action: Reject**
(690-4(C))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
690.4 Installation.
(A) Solar Photovoltaic System. A solar photovoltaic system shall be permitted to supply a building or other structure in addition to any service(s) of another electricity supply system(s).
(B) Conductors of Different Systems. Photovoltaic source circuits and photovoltaic output circuits shall not be contained in the same raceway, cable tray, cable, outlet box, junction box, or similar fitting as feeders or branch circuits of other systems, unless the conductors of the different systems are separated by a partition or are connected together.
(C) Module Connection Arrangement. The connections to a module or panel shall be arranged so that removal of a module or panel from a photovoltaic source circuit does not interrupt a ~~grounded~~ earth conductor to another photovoltaic source circuit. Sets of modules interconnected as systems rated at 50 volts or less, with or without blocking diodes, and having a single overcurrent device shall be considered as a single-source circuit. Supplementary overcurrent devices used for the exclusive protection of the photovoltaic modules are not considered as overcurrent devices for the purpose of this section.
(D) Equipment. Inverters or motor generators shall be identified for use in solar photovoltaic systems. (Text Missing) not apply to ac modules. The photovoltaic source circuit, conductors, and inverters shall be considered as internal wiring of an ac module.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-26 Log #2586 NEC-P13 **Final Action: Reject**
(690-5(B))

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Change the title of the section and revise the text:
690.5(B) Shutting Down the Faulted System. The ground-faults device or system shall automatically disconnect the ungrounded faulted conductors and/or shut off the utility-interactive inverter or charge controller for that portion of the faulted array. If the grounded conductor of the faulted source or output circuit is disconnected to comply with 690.5(A), all conductors of the faulted source or output circuit shall be opened automatically and simultaneously. Opening the grounded conductor of the faulted source or output circuit shall be permitted to interrupt the ground-fault current path.

Substantiation:

The intent of this section is to ensure that equipment such as utility-interactive inverters and charge controllers do not continue to operate when connected to faulted PV source and output circuits. This proposal allows these devices to be either automatically disconnected or turned off to stop their operation. This requirement is in addition to the requirements of 690.5(A).

Panel Meeting Action: Reject

Panel Statement:

There is already language to safely disable and remove faults located in 690.5(A) and (B). The proposal adds complexity and shutting down the inverter or charge controller does not increase safety.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

BOWER: While it is true there is already language to safely disable and remove faults in 690.5(A) and (B), it appears this proposal to change 690.5(B) was submitted to allow additional methods to safely disable and remove the faults. Shutting down or (de-energizing) of the inverter or charge controller can be verified in the listing process and could be an automatic and safe means to shut the faulted system down. This will be an important method for systems that use multiple inverters (sometimes called string inverters) reducing the number of disconnects, boxes, and wiring.

The proposal did add complexity, as would any alternative method to shut down the system. The proposal can be rewritten as below and fully meet the intent while providing the alternative methods for shutting down in the event of a ground fault.

"690.5(B) Shutting Down the Faulted System. A faulted photovoltaic source circuit and the connected inverter or charge controller shall be shut down according to (1) or (2) or both (1) and (2).

(1) The ground-fault device or system shall automatically disconnect the ungrounded faulted conductors. If the grounded conductor of the faulted source or output circuit is disconnected to comply with 690.5(A), all conductors of the faulted source or output circuit shall be opened automatically and simultaneously. Opening the grounded conductor of the faulted source or output circuit shall be permitted to interrupt the ground-fault current path.

(2) The ground-fault device or system shall de-energize the utility-interactive inverter(s) or charge controller(s) for the faulted portion of an array."

13-27 Log #2269 NEC-P13 **Final Action: Reject**
(690-5(B & C))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
690.5 Ground-Fault Protection. Roof-mounted dc photovoltaic arrays located on dwellings shall be provided with dc ground-fault protection to reduce fire hazards.
(A) Ground-Fault Detection and Interruption. The ground-fault protection device or system shall be capable of detecting a ground fault, interrupting the flow of fault current, and providing an indication of the fault.
(B) Disconnection of Conductors. The ungrounded conductors of the faulted source circuit shall be automatically disconnected. If the ~~grounded~~ earth conductors of the faulted source circuit are disconnected to comply with the requirements of 690.5(A), all conductors of the faulted source circuit shall be opened automatically and simultaneously. Opening the ~~grounded~~ earth conductor of the array or opening the faulted sections of the array shall be permitted to interrupt the ground-fault current path.
(C) Labels and Markings. Labels and markings shall be applied near the ground-fault indicator at a visible location, stating that, if a ground fault is indicated, the normally ~~grounded~~ earth conductors may be energized and ungrounded.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject
Panel Statement:
The revised wording does not provide clarity.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

13-28 Log #2587 NEC-P13 **Final Action: Accept**
(690-6)

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise the title to:
690.6 Alternating-Current (ac) Modules.

Substantiation:

Revise the title to include the abbreviation "ac" to identify the term and to match the use of ac in the text of the section.
Panel Meeting Action: Accept
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

13-29 Log #2588 NEC-P13 **Final Action: Reject**
(690-7(A))

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

After the 3rd sentence ending in "Table 690.7", add the following sentence:
Data from the manufacturer of the photovoltaic module shall be permitted to be used in lieu of Table 690.7.

Substantiation:

Table 690.7 was formulated from data based on crystalline and polycrystalline PV modules available in late 1999. Variations of silicon technology are resulting in PV modules with temperature coefficients that do not always match those used for Table 690.7. Table 690.7 is still valid for the majority of installations; however, the proposed change allows the use of PV module manufacturer's data where appropriate.

Panel Meeting Action: Reject

Panel Statement:

The panel desires to continue to use the table and the associated language in Section 690.7.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 14 Negative: 2

Explanation of Negative:

BOWER: The intent of this proposal appeared to be to allow the use of manufacturer's data to calculate the temperature compensation for the maximum photovoltaic system voltage where new crystalline technologies and hybrid crystalline technologies are used in future photovoltaic installations. These changes are for the 2005 code cycle and given that new crystalline photovoltaic technologies are already being sold, and the temperature coefficients of the new technologies are not an exact match to those depicted in the table, the option of using manufacturers data or a temperature correction number as new and hybrid technologies emerge is a logical and safe change.

The proposal as submitted did contain some ambiguity in the requirements, but could met the intent with a change to add a phrase to become part of the third sentence to read:

"For crystalline and multiccrystalliine and silcon-based modules, the rated open-circuit voltage shall be multiplied by the correction factor provided in Table 609.7 or by a correction factor provided by the manufacturer."

ELKINS: Photovoltaics technology is evolving rapidly. This proposal permits the use more accurate and up-to-date manufacturer's data for temperature coefficients in addition to the table values if no manufacturer's data is available. The proposal should be accepted.

Comment on Affirmative:

KOVACIK: The table does not take into account the characteristics of amorphous silicon. However, manufacturers of these products may find it difficult to provide conclusive, reliable temperature characteristics on their products. Further, there are upcoming new technologies that will not be addressed by the present NEC wording. A revision is needed.

STAFFORD: The table listed in 690.7 is desired to be used whenever possible. If the existence of newer and technologically advanced modules are available, then the table should be updated to reflect "other" type modules not included. 690.7(A) includes the statement: "..., or where other than crystalline or multicrystalline silicon photovoltaic modules are used, the system voltage adjustment shall be made in accordance with the manufacturer's instructions." This statement covers the use of photovoltaic modules not listed in Table 690.7.

13-30 Log #1331 NEC-P13 **Final Action: Accept**
(690-7(A)And 690.8(A))

Submitter: National Electrical Code Technical Correlating Committee

Recommendation:

1. Replace the term "computed" with the term "calculated" in the following sections:
690.7(A)
690.8(A)
690.8(B)(1)
690.8(B)(2)
2. Replace the term "computation" with the term "calculation" in the following sections:
690.8(A).

Substantiation:

This proposal is the result of an effort by the NEC Usability Task Group to standardize the language throughout the NEC relative to the use of the terms computed and calculated. After analyzing the usage, the group agreed that the term "calculated" was the best term for use throughout the NEC. This is one in a series of proposals to standardize on the term calculated.

The term "calculate" and its derivatives is presently used in the article title, section titles, and throughout portions of the existing article. Other Articles of the NEC such as for calculating conductor ampacties (under engineering supervision), calculating the size of enclosures, and in Annex D use the term calculate. Additionally, the term "calculate" is more commonly used in other NFPA codes and standards e.g. NFPA 70E, arc flash calculation. Adversely, the term "computation" has a connotation of using a computer, although "load calculations" are frequently determined using a calculator. It appears that the term "computation" was used more frequently beginning with the 1975 NEC based on an editorial revision project.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-31 Log #2823 NEC-P13 **Final Action: Accept**
(690-7(C))

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Revise Section 690.7(C) to read as follows:
(C) Photovoltaic Source and Output Circuits. In one- and two-family dwellings, photovoltaic source circuits and photovoltaic output circuits that do not include lampholders, fixtures, or receptacles shall be permitted to have a maximum photovoltaic systems voltage up to 600 volts. Other installations with a maximum photovoltaic systems voltage over 600 volts shall comply with Article 690, Part I.

Substantiation:

The definition of "systems voltage" does not appear in the NEC. The defined use of Photovoltaic Systems Voltage allows the user to readily determine the required operating threshold of the photovoltaic system. The NEC defines the maximum operating voltage in Article 690.7(A).
There seems to be some confusion over the voltage level that may be present in photovoltaic source circuits and photovoltaic output circuits. By utilizing the defined Photovoltaic systems voltage in the article, the meaning of the NEC is clear.
This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

BOWER: Although this proposal clarifies the language, it still is cumbersome and could be better stated by using the optional (s) with system(s) rather that implying all installations have more than one photovoltaic system. Change the wording to read:
"(C) Photovoltaic Source and Output Circuits. In one- and two-family dwellings, photovoltaic source circuits and photovoltaic output circuits that do not include lampholders, fixtures, or receptacles shall be permitted to have a maximum photovoltaic system(s) voltage up to 600 volts. Other installations with a maximum photovoltaic system(s) voltage over 600 volts shall comply with Article 690, Part I."
ALSO: It would also be prudent to change the definition in 690.2 to :
Photovoltaic System(s) Voltage. "The direct current (dc) voltage of any photovoltaic source or photovoltaic output circuit. For bipolar or multiwire installations, the photovoltaic system(s) voltage is the highest voltage between any two dc conductors."
This change in the definition would also make the usage of system voltage terms appearing in 690.7(A), 690.7(E), 690.41, 690.51, 690.53, 690.80 and 690.85 more consistent. These listed sections could also make use of the optional system(s) term.

13-32 Log #2272 NEC-P13 **Final Action: Reject**
(690-7(E))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
690.7(E)
(E) Bipolar Source and Output Circuits. For 2-wire circuits connected to bipolar systems, the maximum system voltage shall be the highest voltage between the conductors of the 2-wire circuit if all of the following conditions apply:
(1) One conductor of each circuit is solidly grounded.
(2) Each circuit is connected to a separate subarray.
(3) The equipment is clearly marked with a label as follows:
Warning - Bipolar Photovoltaic Array. Disconnection of neutral or ~~grounded~~ earth conductors may result in overvoltage on array or inverter.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-33 Log #2273 NEC-P13 (690-13) **Final Action: Reject**

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:

690.13 All Conductors. Means shall be provided to disconnect all current-carrying conductors of a photovoltaic power source from all other conductors in a building or other structure. Where a circuit grounding connection is not designed to be automatically interrupted as part of the ground-fault protection system required by 690.5, a switch or circuit breaker used as a disconnecting means shall not have a pole in the ~~grounded~~ earth conductor.

FPN: The ~~grounded~~ earth conductor may have a bolted or terminal disconnecting means to allow maintenance or (Text Missing)

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.

I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.

The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.

I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-34 Log #2589 NEC-P13 (690-13) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee directs the panel to clarify their action with regard to the term "pole". This action will be considered by the panel as a public comment.

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise the last sentence to read as follows:

A switch pole or circuit breaker pole shall not be installed in a grounded conductor unless that switch pole or circuit breaker pole is part of a ground-fault detection system required by 690.5 and that switch pole or circuit breaker pole is automatically opened as a normal function of the device in responding to ground faults.

Substantiation:

As written in the 2002 NEC, the language in this section is somewhat unclear with the two negatives. ("Where a circuit grounding connection is **not** designed to be automatically interrupted as part of the ground-fault protection system required by 690.5, a switch or circuit breaker used as a disconnecting means **shall not** have a pole in the grounded conductor").

Furthermore, the existing wording leaves a loophole in the requirement. As written in the 2002 NEC, the sentence now allows a switch or circuit breaker in a grounded conductor if the PV system has a 690.5 device, but does not require that switch or circuit breaker to be a part of the 690.5 device. The proposed revision cleans up the grammar and eliminates the loophole.

Panel Meeting Action: Accept in Principle

Revise the last sentence to read as follows:

"A switch pole or circuit breaker pole shall not be installed in a grounded conductor unless that switch pole or circuit breaker pole is part of a ground-fault detection system required by 690.5 and that switch pole or circuit breaker pole is automatically opened and indicated as a normal function of the device in responding to ground faults."

Panel Statement:

The phrase "and indicated" was added to clarify indication is necessary.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-35 Log #2590 NEC-P13 (690-14(C)(1)) **Final Action: Accept in Principle**

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add a new third paragraph:
Photovoltaic systems having disconnecting means not located in compliance with the requirements of this section with respect to nearness to the point of entry of the system conductors shall comply with 690.31(F).

Substantiation:

There are photovoltaic systems where it is physically impossible or impractical to locate a readily accessible disconnecting means at or near the point of first penetration of the conductors. This proposal refers these installations to a proposed new Section 690.31(F) that requires metal raceways and metal enclosures to be used for such circuits.

Panel Meeting Action: Accept in Principle

Add a new exception to 690.14(C)(1):
Exception: Installations that comply with 690.31(F).

Panel Statement:

This simplified language satisfies the intent of the submitter.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

STAFFORD:

[Text of Proposal 13-35 Explanation of Negative is shown on page 2354]

13-36 Log #2591 NEC-P13 **Final Action: Accept in Principle**
(690-14(D) (New))

TCC Action:

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

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:

690.14(D) Utility-Interactive Inverters Mounted in Not-Readily-Accessible Locations. Utility-interactive inverters shall be permitted to be mounted on roofs or other exterior areas that are not readily accessible. These installations shall comply with (1) through (3).

(1) A direct current photovoltaic disconnecting means shall be mounted near or in the inverter.

(2) An alternating current disconnecting means shall be mounted near or in the inverter.

(3) The alternating current output conductors from the inverter and an additional alternating-current disconnecting means for the inverter shall comply with 690.14(C)(1).

Substantiation:

Several utility-interactive inverters have outdoor-rated enclosures. These inverters may be mounted near the photovoltaic array and may even be mounted on the roofs of dwellings or other buildings in areas that are not readily accessible. AC and dc disconnecting means are still required to service the inverter and should be located near or in the inverter, but they need not be readily accessible. The ac outputs of these inverters should be considered as outputs of the photovoltaic system and these circuits treated the same as any other supply for the building; e.g., the routing of the conductors and the location of the disconnect should be established by 690.14(C)(1).

This type of installation may even be safer than an installation where the dc photovoltaic source circuits have to be run some distance from photovoltaic array to a remotely located, readily accessible dc disconnect located near the inverter. In the case of an inverter mounted near the photovoltaic array, opening the readily accessible ac disconnect ensures that all conductors except those dc photovoltaic source and output conductors (near the photovoltaic array) are unenergized.

The proposed revisions to 690.14(C)(1) and 690.31(F) will also permit these ac inverter output conductors to be run inside a building or structure when they are contained in metal conduits or enclosures.

Panel Meeting Action: Accept in Principle

Add the following new Section:

690.14(D) Utility-Interactive Inverters Mounted in Not-Readily-Accessible Locations. Utility-interactive inverters shall be permitted to be mounted on roofs or other exterior areas that are not readily accessible. These installations shall comply with (1) through (3).

(1) A direct current photovoltaic disconnecting means shall be mounted near or in the inverter.

(2) An alternating current disconnecting means shall be mounted near or in the inverter.

(3) The alternating current output conductors from the inverter and an additional alternating-current disconnecting means for the inverter shall comply with 690.14(C)(1).

(4) A plaque shall be installed in accordance with Section 225.37.

Panel Statement:

Item No 4 was added to include plaques.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

STAFFORD: A standard should be set for utility and fire personnel to disconnect manually all types of energy production systems that may be located on the premises. The acceptance of this addition of a new paragraph to 690-14(C)(1) and associated new 690.31(F) does not specify the location as being a "standard" location for disconnecting means.

Comment on Affirmative:

HORNBERGER: The Panel did not reference item #4 in the section's requirement. Reference should also be made to the 705.10, since the Photovoltaic systems are considered an "Interconnected Electric Power Production Source". The term "near" is not in accordance with the NEC Style Manual. This term should be replaced with "within sight of the inverter and accessible from inverter location."

KOVACIK: Revise last sentence before list to read: "These installations shall comply with (1) through (~~3~~)(4)."

13-37 Log #2819 NEC-P13 **Final Action: Reject**
(690-14(D) (New))

TCC Action:

The Technical Correlating Committee understands that no action was taken because the proposal was "Rejected."

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Revise 690.14 by adding a new paragraph (D) as follows: (Paragraphs A-C remain unchanged).
Photovoltaic disconnecting means shall comply with 690.14(A) through (D).
(D) Requirements for Disconnecting Means of Inverter Output Circuit. Means shall be provided to disconnect all conductors of the photovoltaic output circuit from the AC Electrical Production and Distribution Network. A single disconnecting means in accordance with 690.17 shall be permitted for the combined AC output of one or more inverters or AC modules in an interactive system. Disconnect shall be adjacent to or grouped with the utility disconnecting means. Such disconnecting means shall be in accordance with 690.54, 690.56(B) and 690.64.

Substantiation:

Most utilities are requiring the installation of disconnecting means to allow manual separation of photovoltaic output circuit(s) and the electrical production and distribution network. Frequently, the disconnecting means specified in 690.14(A) through (C) does not require a disconnecting means to be installed exterior to the building or structure to allow "Line Crews" to manually "Lock Out" Photovoltaic Output Circuit Conductors.

Although the inverters supplied today are equipped with a photovoltaic output circuit manual disconnects, they are often not accessible to line crews performing work upon the distribution network. Frequently, line crews are not aware of a photovoltaic array(s) location or disconnecting means. This method gives a visual indication to prevent accidental injury or death from an inverter malfunction, i.e., islanding. The software and hardware utilized in inverters today are not capable of verifying the condition of its "tie" with the local utility. For example, the software and hardware design does not allow for the inverter to verify that a disconnect has been performed when commanded by software instructions. The inverter may attempt and satisfy its control algorithm(s), but may not have actually performed them. "Deterministic" diagnostics are needed before a software only controlled disconnect is sufficient. In addition, alarms (visual or audible) are not present to warn of this condition. As inverters are today, when a loss of utility power is detected an inverter must disconnect its Photovoltaic Output Circuit(s) from the utility grid. This action may be attempted through a software initiated disconnect but there is no way to visually verify that it is performed. In addition, software initiated disconnects are not 100 percent reliable. In the advent of a false detection of utility grid power an inverter will attempt to re-connect its Photovoltaic Output Circuits. Also, software controlled disconnecting means are susceptible to closing or opening its control point of interaction due to stray voltages or noise impressed upon the inverter without a command to do so.

Case example: A software controller can be made to close its (output) point on an industrial grade controller by introducing grounding and static noise interference upon the controller. The result is that a "digital" output point controlling an external disconnecting means can be made to close without instructions from the controller. This is the event this addition is seeking to rectify.

It is hoped that the utility providers will recognize this requirement and implement further visual indications of photovoltaic and other power sources contained within the building or structure. For example, utilities could require that photovoltaic, fuel cell and other power sources that are supplying power that may be back fed onto the grid be identified by the use of a "green" weatherhead, transformer case, or other visible methods.

This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject

Editorial correct AC Electrical Production to ac Electrical Production**.**

Panel Statement:

The PV output circuit is not connected to the electrical production and distribution network. The placement of the diconnect adjacent to the service disconnecting means is impracticle in most commercial installation.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

STAFFORD: A standard should be set for utility and fire personnel to disconnect manually all types of energy production systems that may be located on the premises. The acceptance of this addition of a new paragraph to 690-14(C)(1) and associated new 690.31(F) does not specify the location as being a "standard" location for disconnecting means. Although the inverters supplied today are equipped with a photovoltaic output circuit manual disconnects, they are often not accessible to line crews performing work upon the distribution network as well as fire personnel on location. Frequently, line crews are not aware of a Photovoltaic array(s) location or disconnecting means. This method gives a visual indication to prevent accidental injury or death from an inverter malfunction, i.e. islanding. The software and hardware utilized in inverters today are not capable of verifying the condition of its "tie" with the local utility with 100 percent certainty. It was hoped panel action would have been to accept in principle and revise the wording for the proposed change to reflect a uniform ac disconnect for utility interactive inverters. This proposal again attempts to standardize the use of disconnects for utility and fire personnel.

Comment on Affirmative:

HORNBERGER: The accessibility of the AC disconnecting switch is an important safety issue. As alternative power production sources become more numerous, the location of the source disconnects for all these systems must be addressed. Disconnects of alternative electric power sources must be readily accessible to emergency response teams. Typically, these personnel rely on utility crews to de-energize circuits or transformers to isolate electrical sources prior to fire fighting or rescue. Even with internal protective devices to de-energize on loss of supply, alternative electrical sources to a structure should have a disconnecting means readily accessible on the outside of the structure to provide positive de-energization of all electrical conductors inside a building. Grouping with the service would be best, but being readily accessible and outside the building is more important. Plaques can direct emergency response crews to the various locations.

13-38 Log #2592 NEC-P13 **Final Action: Accept in Principle**
(690-17 Exception No. 1)

Submitter: John C. Wiles, Jr., Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Delete the entire Exception.
A disconnecting means located on the dc side shall be permitted to have an interrupting rating less than the current-carrying rating where the system is designed so the dc switch cannot be opened under load.

Substantiation:

Faults in the inverter and in the wiring between the switch and the inverter or other equipment (required to be simulated by Underwriters Laboratories (UL) Standards Testing Protocols) prohibit the application of the exception.
UL testing for photovoltaic disconnect switches requires that a short circuit be applied to the output of the switch and that the disconnect switch interrupt the short-circuit current numerous times before the switch can be used in a dc photovoltaic disconnect application. This testing requirement effectively says that the switch must be load-break rated (or better yet, short-circuit current rated) and this nullifies 690.17 Exception No. 1.

Panel Meeting Action: Accept in Principle

Editorally renumber exceptions.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

ELKINS: Specific UL standards referenced in the substantiation should be identified.

13-39 Log #2594 NEC-P13 **Final Action: Accept in Principle**
(690-31, FPN)

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the new Fine Print Note:
FPN: Photovoltaic modules operate at elevated temperatures when exposed to high ambient temperatures and to bright sunlight. These temperatures may routinely exceed 70°C (158°F) in many locations. The use of module interconnection conductors with insulation rated for wet locations and having a 90°C (194°F) or greater temperature rating is recommended.

Substantiation:

Field testing of photovoltaic modules by Sandia National Laboratories, National Renewable Energy Laboratory, Southwest Technology Development Institute, and others has shown that module junction box and back of module temperatures may exceed 70°C when ambient temperatures approach 40°C (104°F) under bright sunlight. With 70°C temperatures at the point of connections, conductors with 75°C (167°F) insulations are not suitable; they have no ampacity at these temperatures. Conductors with 90°C (194°F) rated insulation should be used. All outdoor locations (in and out of conduit) are considered wet locations by the NEC so the insulation on conductors in these locations is also required to be rated for use in wet locations. This FPN is required because some PV modules are still marked as being suitable for use with 75°C (167°F) insulated conductors despite extensive field and laboratory testing indicating that these conductors are inadequate.

Panel Meeting Action: Accept in Principle

Add the new Fine Print Note:
FPN: Photovoltaic modules operate at elevated temperatures when exposed to high ambient temperatures and to bright sunlight. These temperatures may routinely exceed 70°C (158°F) in many locations. Module interconnection conductors are available with insulation rated for wet locations and a temperature rating of 90°C (194°F) or greater.

Panel Statement:

The revised language is more explanatory in nature and the recommendation was removed.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

STAFFORD: The table listed in 690.7 is desired to be used whenever possible. If the existence of newer and technologically advanced modules are available, then the table should be updated to reflect "other" type modules not included. 690.7(A) includes the statement: "...or where other than crystalline or multicrystalline silicon photovoltaic modules are used, the system voltage adjustment shall be made in accordance with the manufacturer's instructions." This statement covers the use of photovoltaic modules not listed in Table 690.7.

13-40 Log #2593 NEC-P13 (690-31(B)) **Final Action: Accept**

TCC Action:

The Technical Correlating Committee directs that the Action on this Proposal be rewritten to comply with the NEC Style Manual to read as follows "…as a Type UF multiconductor cable in accordance with Part II of Article 340.".

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise the reference to Article 339 to show Article 340.

Substantiation:

Corrects incorrect reference, if it has not already been done in later editions of the 2002 NEC.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-41 Log #2595 NEC-P13 (690-31(F) (New)) **Final Action: Accept in Principle**

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:

690.31(F) Direct Current Photovoltaic Source and Output Circuits Inside Building. Where direct current photovoltaic source or output circuits or the alternating current outputs of a utility-interactive inverter from building integrated or other photovoltaic system are run inside a building or structure, they shall be contained in metallic raceways or metallic enclosures from the point of penetration of the surface of the building or structure to the first readily accessible disconnecting means. The disconnecting means shall comply with 690.14(A) through (C).

Substantiation:

Building integrated photovoltaic systems (defined in a new definition in 690.2) may have multiple penetration points in the surface of a building or structure. For even a small residential system, the penetrations may number in the hundreds. It is not possible to install an accessible disconnect at each point of penetration. Keeping these dc PV source and output circuits or other dc source and output circuits from roof-mounted PV arrays in metallic raceways and or metallic enclosures from the point of penetration to the first readily accessible disconnect will meet the intent of the NEC for electrical shock and fire hazard safety for these circuits. Routing the ac outputs of remotely located utility-interactive inverters in metallic raceways or enclosures will also increase the safety of these circuits. The metallic enclosures may be needed in some systems to hold blocking diodes, overcurrent devices, and other equipment allowed in these circuits before the PV disconnect by 690.14(B). Metallic raceways and enclosures provide greater mechanical protection and fire hazard reduction than do nonmetallic raceways and enclosures for these circuits that may be energized any time the PV materials are exposed to light.

Panel Meeting Action: Accept in Principle

Add the following new Section:

690.31(F) Direct Current Photovoltaic Source and Output Circuits Inside Building. Where direct current photovoltaic source or output circuits or the alternating current outputs of a utility-interactive inverter from building integrated or other photovoltaic system are run inside a building or structure, they shall be contained in raceways or enclosures from the point of penetration of the surface of the building or structure to the first readily accessible disconnecting means. The disconnecting means shall comply with 690.14(A) through (C).

Panel Statement:

The word "metallic" was deleted to permit nonmetallic and metallic raceways and enclosures.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: Photovoltaic Source and Output circuits do not include AC inverter output conductors. Reference to AC inverter output conductors should be removed. Modifying the submitted proposal to permit use of nonmetallic raceways may increase electrical shock and fire hazard of the installation. Cutting through the conductors and nonmetallic raceway would not produce a return current path for the DC output current, resulting in unexpected and dangerous open circuit output voltages to emergency response or maintenance personnel.

Comment on Affirmative:

ELKINS: The Panel Action deleted the requirement for routing the photovoltaic circuits in "metallic" raceways. Since a photovoltaic's output is current limited, short circuit protection is not possible and ground fault protection is needed to detect conductor damage. Requiring conductors to be routed in metallic raceways provides a path for ground current enabling the ground protection. The original wording of the proposal with its requirement for metal raceways should be used.

STAFFORD: A standard should be set for utility and fire personnel to disconnect manually all types of energy production systems that may be located on the premises. The acceptance of this addition of a new paragraph to 14(C)(1) and associated new 690-31(F) does not specify the location as being a "standard" location for disconnecting means. The intent of 690.31(F) is recognized as requiring the use of raceways for conductors but does not require the existence of a standard location for disconnecting means.

13-42 Log #2596 NEC-P13 **Final Action: Reject**
(690-35 (New))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:
690.35 Ungrounded Photovoltaic Power Systems. Photovoltaic power systems shall be permitted to operate with ungrounded circuit conductors where the system complies with (A) through (F).
(A) All ungrounded photovoltaic source and output circuit conductors shall have disconnects complying with 690 Part III.
(B) All ungrounded photovoltaic source and output circuit conductors shall have overcurrent protection complying with 690.9.
(C) All ungrounded photovoltaic source and output circuit conductors shall be provided a ground-fault protection device or system complying with (1) through (4).
(1) Detect a ground fault current at least as low as 1.0 ampere for each 10 kilowatts of PV array (direct-current output as determined from module labels).
(2) Interrupt the flow of the detected ground-fault current.
(3) Indicate that a ground fault has occurred.
(4) Automatically disconnect the ungrounded faulted conductors and/or shut off the utility-interactive inverter or charge controller for that portion of the faulted array.
(D) The ungrounded photovoltaic source and output conductors shall consist of sheathed (jacketed) multi-conductor cables or shall be installed in conduit.
(E) Ungrounded photovoltaic power system circuit conductors shall be permitted to be used with ungrounded battery systems complying with 690.71(G).
(F) The ungrounded photovoltaic power system shall be labeled with the following warning at each junction box, combiner box, disconnect and device where the ungrounded conductors may be exposed during service.
"Warning! Electric Shock Hazard. The conductors of this photovoltaic power system are ungrounded, but may be energized with respect to ground due to leakage paths and/or ground faults."

Substantiation:

In many parts of the world, photovoltaic power systems are being installed and operated safely with none of the PV source circuit or PV output circuits grounded. Peer-reviewed IEEE technical papers have substantiated the fact that either grounded or ungrounded PV systems may be installed and operated safely.
This proposal allows PV systems to operate with the PV source and output circuits ungrounded providing several conditions are met. These conditions are similar to the conditions under which ungrounded European PV systems are installed and operated safely.
Paragraphs (A) and (B) require that the ungrounded system comply with NEC provisions found in other articles. Disconnects and overcurrent protection will be required in each ungrounded conductor.
Paragraph (C) ensures that ground faults are detected and interrupted, indicated, and the array or faulted portion of the PV array is disabled or disconnected. Turning off the utility-interactive inverter or charge controller effectively meets the requirement to disable the PV array and is allowed.
Paragraph (D) requiring sheathed or jacketed cables or conduit is consistent with European practice requiring double insulation on PV conductors. There are no single-conductor cables in the US that are equivalent to the European double insulated conductors. For example, European USE-2 single conductor cables have an insulation that is nearly twice as thick as the standard USE-2 available in the US. The use of a jacketed cable or conductors installed in conduit provides the second layer of insulation and enhances the safety of these systems where the ungrounded conductors are exposed to weathering, ultra violet exposure, and possible decay over time.
Paragraph (E) allows these ungrounded PV systems to be used with the ungrounded battery systems.
The warning in paragraph F is required because many PV installers think that ungrounded PV systems are inherently safe and that either conductor may be touched at any time. They do not understand that normally present current leakage paths and ground faults may create single-touch shock hazards.

Panel Meeting Action: Reject

Panel Statement:

Section 250.162(A) and 690.41 requires grounding of the systems over 50 volts. The technical substantiation to allow 1 amp limit per 10KW was not provided.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 14 Negative: 2

Explanation of Negative:

BOWER: The proposal as submitted was basically very comprehensive and provided all of the necessary requirements for installing a photovoltaic system with an ungrounded array. The Panel Statement is correct in pointing out that 250.162(A) and 690.41 requires grounding of systems over 50 volts, but overlooks the fact that 250.162 reads: "A 2-wire, dc system supplying premises wiring and operating at greater than 50 volts but not greater than 300 volts shall be grounded." Many photovoltaic systems operate at dc voltages above 300 volts, but are currently required to be grounded per 690.41, which states "For a photovoltaic power source, one conductor of a two-wire system with a system voltage over 50 volts and the reference (center tap) conductor of a bipolar system shall be solidly grounded or shall use other methods that accomplish equivalent system protection in accordance with 250.4(A) and that utilize equipment listed and identified for the use." Additionally ungrounding the photovoltaic array operating between 50 and 500 Volts creates no additional hazards and should be included.
If this proposal (13-42) were to be accepted, 690.41 would need to be changed to contain an exception or language that refers to the alternative (proposed 690.35). That could be handled by the Technical Correlating Committee or submitted as an additional clarification as part of the public comment process.
Suggested text is:
690.41 System Grounding. <u>System Grounding methods in accordance with (A) or (B) shall be allowed.</u>
(A) Grounded Systems: For a photovoltaic power source, one conductor of a two-wire system with a system voltage over 50 volts and the reference (center tap) conductor of a bipolar system shall be solidly grounded or shall use other methods that accomplish equivalent system protection in accordance with 250.4(A) and that utilize equipment listed and identified for the use.
(B) Ungrounded Systems: Photovoltaic power source circuits shall be permitted in accordance with 690.35

~~(B) Ungrounded Systems. Photovoltaic power source circuits shall be permitted in accordance with 690.35.~~

The panel was correct in observing there was no substantiation for the 1 amp per 10kW detection level for a photovoltaic array, however, the language using the suggested value should have been changed to a FPN to alert installers and inspectors of a maximum value and maintain the intent of the proposal. NO other code language specifies a value for the trip level of a ground fault device except when used in conjunction with line isolation monitors for personnel safety.

Additionally, proposed 690.35(C)(4) should be reworded to avoid confusion since all the conductors are already ungrounded:

Suggested text for 690.35(C) is:

(C) All ~~ungrounded~~ photovoltaic source and output circuit conductors shall be provided a ground-fault protection device or system complying with (1) through (3) and shall:

(1) Interrupt the flow of the detected ground-fault current.

(2) Indicate that a ground fault has occurred.

(3) Automatically disconnect the ~~ungrounded faulted~~ conductors of the faulted circuit from the inverter or charge controller and/or cause the utility-interactive inverter or charge controller for that portion of the faulted array to de-energize.

FPN: Detection of a ground fault current should be at least as low as 1.0 ampere for each 10 kilowatts of PV array (direct-current) output as determined from module labels.

KOVACIK: 250.162(A) states that two-wire DC systems between 50 volts and 300 volts should be grounded. Article 690 allows much higher DC voltages to be used. There is existing precedence for high-voltage DC ungrounded systems, such as those battery banks used in UPS systems, to provide safety for service personnel working around grounded support structures from inadvertent contact with the single-ungrounded conductor. In some PV installations, the same hazard could exist. 690.41 in the NEC allows for ungrounded PV arrays providing they are done with equipment "listed" to provide equivalent protection. The proposed new requirements make the equivalent protection clear.

Comment on Affirmative:

ELKINS: Ungrounded operation of photovoltaics should be permitted if provided with an adequate ground detection system noted in the proposal. The proposal, however, should be modified to restrict the conductors to metal conduit installations to ensure a path for the ground fault current.

STAFFORD: Presently 250.162(A) and 690.41 requires grounding of systems over 50 volts. Technical substantiation was not given as to the threshold limit of 1 amp per 10 KW was not given. In addition, a ground fault could occur in the photovoltaic source circuits or photovoltaic output circuit and the requirement does not provide a method for disconnecting the fault as stated. Merely opening the source conductors under fault condition does not eliminate the fault potential. Rather, a disconnecting means would have to be introduced at the module itself to truly open fault current paths.

13-43 Log #2820 NEC-P13 (690-41) **Final Action: Accept**

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Revise Section 690.41 to read as follows:

For a photovoltaic power source, one conductor of a two-wire system with a photovoltaic systems voltage over 50 volts and the reference (center tap) conductor of a bipolar system shall be solidly grounded or shall use other methods that accomplish equivalent system protection in accordance with 250.4(A) and that utilize equipment listed and identified for the use.

Substantiation:

The definition of "system voltage" does not appear in the NEC but rather is defined as Photovoltaic Systems Voltage. The NEC defines the maximum operating voltage in 690.7(A).

There seems to be some confusion over the voltage threshold in which grounding of the system is to be required. Presently, a four module system, called a 48 volt system, is by some inspectors allowed to be installed without grounding. The Photovoltaic Systems Voltage may be as high as 80 volts and the NEC attempts to require these systems to be grounded, but presently may not be accomplishing the intent due to poor clarification.

This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

BOWER: Although this proposal clarifies the language, it is still cumbersome and could be better understood by allowing the optional (s) with system(s) rather than implying all installations have more than one photovoltaic system. Change the wording to read "For a photovoltaic power source, one conductor of a two-wire system with a photovoltaic system(s) voltage over 50 volts and the reference (center tap) conductor of a bipolar system shall be solidly grounded or shall use other methods that accomplish equivalent system protection in accordance with 250.4(A) and that utilize equipment listed and identified for the use."

Note: It would also be prudent to change the definition in 690.2 to:

Photovoltaic System(s) Voltage. "The direct current (dc) voltage of any photovoltaic source or photovoltaic output circuit. For bipolar or multiwire installations, the photovoltaic system(s) voltage is the highest voltage between any two dc conductors."

This change in the definition would also make the usage of system voltage terms appearing in 690.7(A), 690.7(E), 690.41, 690.51, 690.53, 690.80, and 690.85 more consistent. These articles could also make use of the optional system(s) term.

13-44 Log #2597 NEC-P13 **Final Action: Reject**
(690-42)

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new second paragraph:
Inverters or other dc utilization equipment requiring that the single point of systems grounding be made inside the device shall have the requirement clearly marked on the device and in instructions accompanying the product and that point shall be used for system grounding.

Substantiation:

The 2002 NEC Section 690.42 established the single point for dc system grounding to be on the photovoltaic output circuit. The definition of Photovoltaic Output Circuit in Section 690.2 excludes circuits in the inverter or dc utilization equipment. Several utility-interactive inverters, photovoltaic power panels, and ground-fault devices require that the point of system grounding be made inside these devices for proper grounding and ground-fault (690.5) protection. This proposal provides the necessary clarification that the grounding point (bonding point) may be inside these devices. Inspectors have rejected photovoltaic installations using one of the subject inverters unless a letter is obtained from UL for every installation.

Panel Meeting Action: Reject

Panel Statement:

Equipment marking and instruction manuals are covered by UL Standard 1741.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-45 Log #2821 NEC-P13 **Final Action: Reject**
(690-42)

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Revise 690.42 to read as follows:
The dc circuit grounding connection shall be made at ~~any single point on the photovoltaic output circuit.~~ the inverter and identified as the Photovoltaic Source Ground.
FPN: Locating the grounding connection point as close as practicable to the photovoltaic source better protects the system from voltage surges due to lightning.

Substantiation:

Grounding the photovoltaic source at the inverter allows for the proper operation of the ground fault detection device that is designed to detect and interrupt ground faults within the Photovoltaic Source Circuits.
Grounding a photovoltaic source at points other than the inverter may bypass ground fault detection methods and not interrupt a faulted circuit. By locating the ground connection in the inverter the photovoltaic source is at the same potential to ground as the grounded inverter. This allows an accurate comparison of ground by the ground fault detection means to the same potential as the photovoltaic source.
This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject

Panel Statement:

Language already exists in present 690.42 for an adequate single point system ground and restricting that point of ground to an inverter does not cover PV systems without inverters. Also see panel statement on Proposal 13-44 which clarifies the labeling requirement.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

STAFFORD: Grounding the Photovoltaic source at the inverter allows for the proper operation of the ground fault detection device that is designed to detect and interrupt ground faults within the Photovoltaic Source Circuits. Grounding a photovoltaic source at points other than the inverter may bypass ground fault detection methods and not interrupt a faulted circuit. By locating the ground connection in the inverter, the Photovoltaic source is at the same potential to ground as the grounded inverter. This allows an accurate comparison of ground by the ground fault detection means to the same potential as the photovoltaic source. It was desired for panel action to accept in principle the intent of this submission and to provide wording to exclude the photovoltaic systems installed without inverters.

13-46 Log #1998 NEC-P13 **Final Action: Reject**
(690-45)

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
690.45 Size of Equipment ~~Grounding~~ Bonding Conductor. Where not protected by the ground-fault protection equipment required by 690.5, the equipment ~~grounding~~ bonding conductor for photovoltaic source and photovoltaic output circuits shall be sized for 125 percent of the photovoltaic-originated short-circuit currents in that circuit. Where protected by the ground-fault protection equipment required by 690.5, the equipment ~~grounding~~ bonding conductors for photovoltaic source and photovoltaic output circuits shall be sized in accordance with 250.122.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See the panel action and statement on Proposal 13-1.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: "Grounded" and "grounding" sound similar but are intended to describe two totally different concepts. However, these terms are often used interchangeably by users of the NEC. In fact, there are places in the NEC where these terms are used interchangeably. The words ground, grounded and grounding will apply to the concept of connecting an electrical system to the earth. While the words bond, bonded and bonding will apply to the concept of connecting together noncurrent carrying conductive parts likely to become energized so that they form an effective ground fault path back to the source. If the terms are not similar, the concepts can be more easily differentiated by the users. This change will greatly improve usability and understanding of the NEC. This issue needs to be brought forth through the Technical Correlating Committee and the use of the individual terms should be evaluated on their merit on a case-by-case basis.
For example, the term ground fault used in the above paragraph describes a particular type of electrical fault and is used appropriately in the above text.

13-47 Log #2598 NEC-P13 **Final Action: Accept**
(690-47(C) (New))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:
690.47(C) Systems with Alternating Current and Direct Current Grounding Requirements. Photovoltaic power systems with both alternating current and direct-current (dc) grounding requirements shall be permitted to be grounded as described in (1) or (2).
(1) A grounding-electrode conductor shall be connected between the identified dc grounding point to a separate dc grounding electrode. The dc grounding-electrode conductor shall be sized according to 250.166. The dc grounding electrode shall be bonded to the ac-grounding electrode to make a grounding electrode system according to 250.52 and 250.53. The bonding conductor shall be no smaller than the largest grounding electrode conductor, either ac or dc.
(2) The dc grounding electrode conductor and ac grounding electrode conductor shall be connected to a single grounding electrode. The separate grounding electrode conductors shall be sized as required by 250.66(ac) and 250.166(dc).

Substantiation:

The NEC addresses the grounding of ac systems and dc systems in separate sections. The NEC does not specifically address systems where both dc and ac grounding must be made in the same system. In photovoltaic systems there are usually both dc and ac circuits/systems that need to be grounded.
If the equipment-grounding system is connected in a manner that no ground-fault currents can normally flow through the grounding electrode conductor, then the intent of the code is met; grounding electrode conductors and grounding electrodes do not carry ground-fault currents, only lightning induced surge currents and currents from accidental cross connection to other systems. If no ground-fault currents travel in grounding electrode conductors, then the sizing requirements apply from NEC Sections 250.66(ac) and 250.166(dc).
This proposal allows two clearly specified approaches to provide ac and dc system grounding and eliminates confusion on these techniques found in Article 250 when it comes to systems with both ac and dc grounding requirements.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-48 Log #2599 NEC-P13 **Final Action: Accept in Part**
(690-48 (New))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:
690.48 Continuity of Equipment-Grounding Systems. All exposed conducting surfaces in the photovoltaic source and output circuits that are normally grounded with equipment-grounding conductors shall be connected in a manner that they shall remain grounded when any equipment in the photovoltaic system is removed for service. Temporary bonding jumpers are permitted.

Substantiation:

Direct-current photovoltaic source and output circuits are energized at any time the photovoltaic modules are illuminated. The equipment-grounding system is the first code-required line of defense against shock and fire hazards. It must remain intact whenever these circuits are energized. Some photovoltaic power systems are being installed where all equipment-grounding conductors are tied together and routed through equipment such as the inverter. The final bond to the grounding electrode is made at the ac panelboard and if the utility-interactive inverter is removed for service, the equipment-grounding conductors are no longer connected to ground. This represents a shock hazard and possible fire hazard since these circuits are energized whenever the PV source is illuminated. These circuits are different than other source and load circuits, which may be de-energized at the source.
Installing a temporary equipment-grounding conductor (bonding jumper) around the inverter or any other equipment that may, if removed, interrupt the connection of the equipment-grounding conductor and grounding system easily corrects the problem.

Panel Meeting Action: Accept in Part

Delete the last sentence from the proposed text.

Panel Statement:

The grounding system should not rely on temporary jumpers. This is not enforceable code. Maintenance personnel may inadvertently remove equipment without installing the jumpers. The equipment grounding connections should be designed for the removal of equipment without interrupting the continuity of grounds to remaining equipment.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

KOVACIK: The panel action should have been to accept entire proposal. Temporary bonding conductors should be permitted for servicing. A temporary conductor does not imply an unreliable conductor. The use of such a temporary bonding jumper could be supported with a marking in the end-product standard, UL 1741.

13-49 Log #2600 NEC-P13 **Final Action: Reject**
(690-49 (New))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:
690.49 Continuity of Photovoltaic Source and Output Circuit Grounded Conductors. Where the removal of the utility-interactive inverter or other equipment disconnects the bonding connection between the grounding electrode conductor and the photovoltaic source and/or photovoltaic output circuit grounded conductor, a temporary bonding jumper shall be installed before the equipment is removed.

Substantiation:

Direct-current photovoltaic source and output circuits are energized at any time the photovoltaic modules are illuminated. The marked grounded conductors are normally assumed to be connected to ground except under certain actions of code-required Section 690.5 ground-fault protection equipment. These conductors should remain grounded whenever these circuits are energized.
Some utility-interactive photovoltaic power systems are being installed where the system grounding bond is routed through the inverter that may be removed for service. The final bond to the grounding electrode is made at the ac panelboard and if the utility-interactive inverter is removed for service, the grounded conductors are no longer connected to ground. This represents a shock hazard and possible fire hazard.
The problem is easily corrected by adding a temporary bonding jumper from the grounded conductor to ground when the inverter is removed for service. PV source and output circuits are nearly unique in this area. Load circuits and other source circuits can be turned off at the source and ungrounded conductors are not energized.

Panel Meeting Action: Reject

Panel Statement:

See the panel statement on Proposal 13-48.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 14 Negative: 2

Explanation of Negative:

BOWER: This proposal attempted to address a fundamental safety issue for instances when removal of an inverter or other equipment interrupts the bonding connection between the grounding electrode conductor and the photovoltaic source or the photovoltaic output circuit grounded conductor. It is important to maintain that bond since photovoltaic arrays are outdoors, vulnerable to vandalism, accidental breakage from external factors and may be in wet locations at times.
The Panel Action was to reject the proposal, but it could have been accepted in principle in part with changes to the language to require connection methods that ensure the equipment ground connections even if the inverter is removed for service.
A suggested alternative is:
690.49 Continuity of Photovoltaic Source and Output Circuit Grounded Conductors. Where the removal of a utility-interactive inverter or other equipment can interrupt the bonding connection between the grounding electrode conductor and the photovoltaic source and/or photovoltaic output circuit grounded conductor, that equipment shall be connected in a manner such that the equipment ground remains connected.
I believe this would satisfy the intent of the proposal and provide the solution to a safety issue.
KOVACIK: See my Explanation of Negative Vote on Proposal 13-48.

13-50 Log #2601 NEC-P13 **Final Action: Accept**
(690-53)

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Change the title to: Direct Current Photovoltaic Power Source.
Revise the first sentence of the Section as follows:
A marking for the direct current photovoltaic power source indicating items (1) through (4) shall be provided by the installer at an accessible location at the disconnecting means for this power source:

Substantiation:

Clarifies the section as referring to the direct current photovoltaic power source. Simplifies the language.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-51 Log #2274 NEC-P13 **Final Action: Reject**
(690-55)

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
690.55 Photovoltaic Power Systems Employing Energy Storage. Photovoltaic power systems employing energy storage shall also be marked with the maximum operating voltage, including any equalization voltage and the polarity of the ~~grounded~~ earth circuit conductor.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-52 Log #2822 NEC-P13 **Final Action: Reject**
(690-57 (New))

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Add a new Section 690.57 to read as follows:
690.57 Interactive System Point of Interconnection. All interactive system(s) points of interconnection with other sources shall be marked at an accessible location at the disconnecting means as a power source with the maximum ac output operating current and the operating ac voltage. Where interactive systems may operate as a Stand-Alone System through bypassing the inverter, disconnecting means shall indicate normal and bypass positions.

Substantiation:

Inverters may operate in a "Bypass" mode where AC power is routed through the inverter to critical loads. Presently, some disconnecting means indicate an "off" position but allow AC utility power to supply loads driven by the inverter.
The intent here is not to prevent inverters from operating in the bypass mode but rather to have marking indicate when an inverter is operating in a bypass mode. Some inverters on the market today and distributed under the 2002 NEC have markings on the disconnecting means which state "off". These inverters can still supply loads through the connection marked "off" and present a real hazard. Inverters should be able to operate in the "bypass" mode to allow maintenance to be performed upon the inverter, but the markings on the disconnecting means should indicate "Bypass".
This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject

Panel Statement:

The first sentence is a repeat of 690.54.
The bypass circuitry is in the inverter and cannot be marked to indicate its position.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

STAFFORD: Inverters may operate in a "Bypass" mode where AC power is routed through the inverter to critical loads. Presently, some disconnecting means indicate an "off" position but allow AC Utility Power to supply loads driven by the inverter. The intent here is not to prevent inverters from operating in the bypass mode, but rather to have marking indicate when an inverter is operating in a bypass mode. Some inverters on the market today and distributed under the 2002 NEC have markings on the disconnecting means which state "off". These inverters can still supply loads bypassing the inverter through the connection marked "off" and present a real hazard. Inverters should be able to operate in the "bypass" mode to allow maintenance to be performed upon the inverter, but the markings on the disconnecting means should indicate "Bypass".

13-53 Log #2748 NEC-P13 **Final Action: Reject**
(690-64(B)(1) Exception (New))

Submitter: Paul Garvison, BP Solar

Recommendation:

Add the following Exception:
Exception: A photovoltaic power source interconnection shall not be required to be made at a dedicated circuit breaker or fusible disconnecting means if the circuit breaker or fusible disconnecting means is sized so that the sum of its current rating plus that of the photovoltaic power source does not exceed the rating of the circuit protected by the circuit breaker or fusible disconnecting means. Additionally, the circuit breaker or fusible disconnecting means must be marked to indicate this limitation.

Substantiation:

The purpose of 690.64(B)(1) is to prevent individual circuits having both loads and multiple sources which could result in exceeding circuit current carrying capacity. By restricting the circuit breaker rating, the language above allows PV source circuits to be safely connected to circuits carrying loads while eliminating the risk. Marking these circuits accordingly prevents inadvertent return to an overcurrent risk at a later date.

Panel Meeting Action: Reject

Panel Statement:

The submitter is suggesting that marking at the circuit breaker or disconnecting means would prevent any future source connections to the circuit. This may be the case during the initial installation but at a later date if the marking is removed then an unsafe situation would exist. Overcurrent design and protection of circuits through marking versus proper connections is an unwise code provision. In addition, the special cases of arc fault and ground fault protection devices are not addressed.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

ELKINS: Photovoltaics' output are current limited, so the maximum current which can be delivered by a photovoltaic source in parallel with a circuit breaker protected source is known. With the load circuit conductors sized to carry the sum of these, no normal overload risk should exist. The proposal, however, should be modified to cover ground fault protection as noted in the Panel Statement and shorted load circuit protection for the photovoltaic supply.

HORNBERGER: This comment is in support of the panel's action. Mixing of loads and sources on individual branch circuits can result in overcurrent conditions within the circuit conductors that will not be detected by the overcurrent device at the source of the branch circuit. The submitter's proposal would be difficult for the authority having jurisdiction to enforce as other sources and loads can be "plugged" into the branch circuit.

STAFFORD: The panel statement's actions are correct in providing substantiation for rejecting the proposal. In addition, it should be stressed that the proposal does not take into account the installation of photovoltaic power sources installed and connected to branch circuit wiring that may be supplied from Ground Fault detection devices or Arc Fault Circuit Interrupter devices. In addition, the proposal does not take into account future alterations in branch circuit wiring adequately thorough marking.

13-54 Log #2602 NEC-P13 **Final Action: Reject**
(690-64(B)(5))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise the text as shown and add the Fine Print Note:
Equipment such as circuit breakers, if backfed, shall be identified for such operation. Dedicated circuit breakers backfed from utility-interactive inverters shall not be required to be clamped to the panelboard bus bars. Main circuit breakers connected directly to energized feeders shall be clamped.
FPN: Circuit breakers not having terminals with "Line" and "Load" markings shall be considered acceptable for back feeding.

Substantiation:

Section 408.16(F) requires that backfed circuit breakers be clamped. Nothing in Article 690 contradicts this requirement (See 690.3) so backfed circuit breakers in utility-interactive photovoltaic systems must also be clamped. The 408.16(F) requirement is applicable to open panelboards using plug-in circuit breakers connected to rotating machines with voltage outputs. An inadvertently unplugged circuit breaker represents a safety hazard since the exposed terminals may be energized and/or arcing may occur.
With the electronic utility-interactive inverters as required by Article 690 in photovoltaic power systems, this safety hazard does not exist due to the required electronic shut-down features required in these inverters. If the backfed breaker is unplugged, the utility voltage is no longer connected to the inverter output and by design (with testing and listing); the inverter must cease to have any output-usually within a few tens of milliseconds. The arc and shock hazard do not exist with these inverters and backfed circuit breakers.
Of course, any main circuit breaker would need to be clamped (if a plug-on variety), since the main breaker, while being backfed, will usually have the wired terminals attached to the utility power and this connection would generally cause the exposed breaker terminals to be energized.
In all cases, panelboards containing circuit breakers that are likely to be backfed require a tool to remove the screw-on cover that clamps all circuit breakers to the panelboards bus bars.
FPN. The requirement that the backfed circuit breaker be identified for back feeding is not widely understood. From discussions with engineers at Underwriters Laboratories (UL), it has been determined that molded case circuit breakers are suitable (identified) for back feeding when they do not have terminals marked "Line" and "Load".
In actual use in a utility-interactive PV installation, a backfed breaker will only be subjected to tripping by currents flowing from the grid into a fault in the wiring to the inverter. The fault currents will not back feed the breaker, but will flow in the normal manner through the circuit breaker.

Panel Meeting Action: Reject

Panel Statement:

The requirement of 408.16(F), plug-in-type overcurrent protection devices or plug-in type-main lug assemblies that are backfed and used to terminate field-installed ungrounded supply conductors, is as applicable for photovoltaic systems even with the shutoff feature mentioned by the submitter. An inadvertent connection at the point of back feed or a failure of the electronic equipment that could provide back feed is reason enough not to allow this proposal change. Having the provisions of 408.16(F) will alert personnel to the possible danger. The existing language of identification as defined by code, "Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular Code requirement." provides the means for the installation of proper equipment designed for dual feeds. The submitter's FPN as written may allow equipment not suitable for the application and is not accepted.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

BOWER: There have been numerous instances where a clamping device has been found to be unavailable. The anti-islanding feature required for inverters that are intended for utility-interactive operation prevents any backfeeding when the utility is not present. The nature of circuit breaker design puts them inside entrance panels or panelboards that require a tool for access and removal. The clamping feature is redundant and unnecessary when inverters listed for the purpose are used.
The language of this proposed change needs clarification and that may be submitted in the public comment process.
ELKINS: The proposal would be acceptable if the requirement that the inverter automatically shuts off when disconnected from the utility supply noted in the substantiation was included in the NEC text, and the requirement that the circuit breaker not be marked with "Line" and "Load" shown in the FPN in the proposal was moved into the section text.

13-55 Log #2603 NEC-P13 **Final Action: Reject**
(690-65 (New))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Add the following new Section:
690.65 Utility-Interactive Inverter Source Panels. Utility-interactive inverters may be connected to ac panelboard without compliance with the requirements of 690.64(B)(2) where the installation complies with (1) and (2).
(1) The installation is comprised of multiple utility-interactive inverters connected to a panelboard.
(2) The panelboard is placarded as follows:
"Warning: Utility-Interactive Photovoltaic Source Panel".
"The sum of the ratings of all circuit breakers supplying loads (if any) in this panelboard is limited to the current rating of the main circuit breaker or the rating of the panelboard whichever is less."

Substantiation:

The wording of Section 690.64(B)(2) in the 2002 NEC requires that a panelboard used as a source panel for utility-interactive inverters have a rating of twice the sum of the circuit breakers supplying current from utility-interactive inverters. This is because the rating of the main circuit breaker (supplying current from the grid) plus the sum of all circuit breakers supplying current from utility-interactive photovoltaic inverters can be no greater than the current rating of the bus bars in the panelboard. For example: given four (4) 20-amp circuit breakers supplying current from utility-interactive inverters, the main circuit breaker must be rated at 80 amps (4 x 20) to handle the operating current from the inverters and the panelboard must be rated at 160 amps to meet 690.64(B)(2) requirements. With no load circuits attached, the maximum current that the bus bars in the panelboard will ever see is 80 amps.
In this example, if the sum of the ratings of the circuit breakers supplying any loads in this new panelboard were restricted (Placard) to 80 amps, then under all conditions of load currents, source currents, and fault currents, the panelboard bus bars would never see more than 80 amps and it would be unnecessary to install a 160-amp panelboard.
The allowance of a limited number of load circuits in the panelboard allows for the connections of loads associated with instrumentation circuits for the PV system without requiring a second panelboard.
The last sentence in the proposal helps to minimize the occurrence of nuisance trips where a main circuit breaker has been installed that has a rating lower than the rating of the panelboard.

Panel Meeting Action: Reject

Panel Statement:

The ampacity of the busbar is the limiting factor. Since the main overcurrent protection no longer monitors the total bus load, the restriction of limiting the sum of the sources to the bus ampacity is the only requirement that is enforceable.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-56 Log #249 NEC-P13 **Final Action: Reject**
(690-71)

Submitter: Daniel Gasper Millington, MI

Recommendation:

Revise 690.71 by moving paragraph (B) to become Section 480.11 and making the following changes at the beginning of the section:
690.71 Storage Batteries. Storage batteries ~~in a solar photovoltaic system~~ shall be installed in accordance with the provisions of Article 480, and (A) through (F).
Place the Fine Print Note that was under paragraph (B) in this location with no change.
(A) Grounding. The interconnected battery cells shall be considered grounded where the photovoltaic power source is installed in accordance with 690.41.
Delete paragraph (B), revise as in companion proposal and leave to become 480.11. Then, change the letter designations of the remaining paragraphs with no changes in those paragraphs.

Substantiation:

Paragraph (B) needs to be moved to Article 480 so it applies to all dwelling storage battery installations. The remainder of 690.71 is unique to photovoltaic systems and needs to remain at this location. The grounding reference in paragraph (A) needs to be pulled out and labeled so it is easily recognized. The first sentence of paragraph (A) can be a general statement.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 13-12.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-57 Log #2604 NEC-P13 **Final Action: Reject**
(690-71(B)(1))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Revise the sentence as follows: No change in the Exception.
Storage batteries for dwellings shall have no more than twenty-four 2-volt cells connected in series (48-volts nominal).

Substantiation:

Revises the language of this section to align with changes made in 690.71(2) (D through G) in the 2002 NEC. Avoids confusion in the exact battery voltage due to the fact that equalization voltages of lead-acid batteries are substantially higher than the nominal voltage. For example, a 48-volt (nominal) system may have an equalization voltage as high as 64-65 volts, but is still considered safe for dwelling installations.

Panel Meeting Action: Reject

Panel Statement:

This proposal either needs to specify lead acid batteries or propose to change language to include new technologies such as Lithium (3.5V/cell). This is not an improvement over existing language.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

BOWER: The intent of the proposal was to align the section with language changed in the 2002 edition of the NEC. Rejection of this proposal fails to align that language with 690.71(D) through (G) which uses similar language in each case and reads:
(D) Battery Nonconductive Cases and Conductive Racks. Flooded, vented, lead-acid batteries with more than twenty-four 2-volt cells connected in series (48 volts, nominal) shall not use conductive cases or shall not be installed in conductive cases. Conductive racks used to support the nonconductive cases shall be permitted where no rack material is located within 150 mm (6 in.) of the tops of the nonconductive cases.
This requirement shall not apply to any type of valve-regulated lead-acid (VRLA) battery or any other types of sealed batteries that may require steel cases for proper operation.
(E) Disconnection of Series Battery Circuits. Battery circuits subject to field servicing, where more than twenty-four 2-volt cells are connected in series (48 volts, nominal), shall have provisions to disconnect the series-connected strings into segments of 24 cells or less for maintenance by qualified persons. Non-load-break bolted or plug-in disconnects shall be permitted.
(F) Battery Maintenance Disconnecting Means. Battery installations, where there are more than twenty-four 2-volt cells connected in series (48 volts, nominal), shall have a disconnecting means, accessible only to qualified persons, that disconnects the grounded circuit conductor(s) in the battery electrical system for maintenance. This disconnecting means shall not disconnect the grounded circuit conductor(s) for the remainder of the photovoltaic electrical system. A non-load-break-rated switch shall be permitted to be used as the disconnecting means.
(G) Battery Systems of More Than 48 Volts. On photovoltaic systems where the battery system consists of more than twenty-four 2-volt cells connected in series (more than 48 volts, nominal), the battery system shall be permitted to operate with ungrounded conductors, provided the conditions in 690.71(G)(1) through (G)(4) are met.
Dealing with the new technologies such as Lithium cells at 3.5V/cell did not appear to be the intent of this proposal. To reject the proposed 690.71(B)(1) because it omits new technologies would be inconsistent with other parts of Article 690 and should be part of a complete process to deal with all types of battery chemistries.

13-58 Log #3312 NEC-P13 **Final Action: Reject**
(690-71(B)(1))

Submitter: John C. Wiles, Southwest Technology Development Institute

Recommendation:

Revise the sentence as follows: No change in the exception.
Storage batteries for dwellings shall have no more than twenty-four 2-volt cells connected in series (48-volts nominal).

Substantiation:

Revises the language of this section to align with changes made in Sections 690.71(2)(D-G) in the 2002 NEC. Avoids confusion in the exact battery voltage due to the fact that equalization voltages of lead-acid batteries are substantially higher than the nominal voltage. For example, a 48-volt (nominal) system may have an equalization voltage as high as 64-65 volts, but is still considered safe for dwelling installations.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-57.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Explanation of Negative:

Comment on Affirmative:

BOWER: This was a repeat of 13-57 and should be rejected on that alone. Otherwise, it will continue to follow the 13-57 proposal.

13-59 Log #2275 NEC-P13 **Final Action: Reject**
(690-71(F))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
690-71(F)
(F) Battery Maintenance Disconnecting Means. Battery installations, where there are more than twenty-four 2-volt cells connected in series (48 volts, nominal), shall have a disconnecting means, accessible only to qualified persons, that disconnects the ~~grounded~~ earth circuit conductor(s) in the battery electrical system for maintenance. This disconnecting means shall not disconnect the ~~grounded~~ earth circuit conductor(s) for the remainder of the photovoltaic electrical system. A non-load-break-rated switch shall be permitted to be used as the disconnecting means.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.

I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.

The NFPA has repeatedly stated it's desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.

I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

13-60 Log #2605 NEC-P13 **Final Action: Accept in Principle**
(690-72(B)(2)(1))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Modify as follows:
The current rating of the diversion load shall be consistent with the current rating of the diversion load charge controller. The power rating of the diversion load shall be at least 150 percent of the power rating of the diversion charge controller.

Substantiation:

This proposal corrects language in the 2002 NEC that required the diversion load be rated at 150 percent of the current rating of the diversion charge controller. This requirement created confusion because the actual current rating of the diversion load must be closely related to the current rating of the controller in order to allow proper functioning of the controller. Diversion loads are generally rated by their current characteristics that must be matched to the current characteristics of the connected charge controller. A 150 percent current relationship to the load would not allow most diversion load controllers to function properly. By changing the 150 percent requirement to apply to the power rating, the confusion is eliminated, and the safety requirement is maintained and clarified.

Panel Meeting Action: Accept in Principle

Revise the proposal to read as follows:
"The current rating of the diversion load shall be less than or equal to the current rating of the diversion load charge controller. The voltage rating of the diversion load shall be greater than the maximum battery voltage.
The power rating of the diversion load shall be at least 150 percent of the power rating of the photovoltaic array."

Panel Statement:

The changes clarify the term "consistent with", adds the requirement for the voltage rating of the diversion load, and adds language to insure the diversion load is sufficient to control the PV array.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-61 Log #2606 NEC-P13 **Final Action: Accept**
(690-72(B)(3))

Submitter: John C. Wiles, Southwest Technology Development Institute / Rep. Photovoltaics Industry Forum

Recommendation:

Replace existing text with the following:
Photovoltaic power systems using utility-interactive inverters to control battery state-of-charge by diverting excess power into the utility system shall comply with (1) and (2).
(1) These systems shall not be required to comply with 690.72(B)(2). The charge regulation circuits used shall comply with the requirements of 690.8.
(2) These systems shall have a second, independent means of controlling the battery charging process for use when the utility is not present or when the primary charge controller fails or is disabled.

Substantiation:

Numerous utility-interactive photovoltaic power systems are being installed that also use batteries to provide energy when utility power is not present. These batteries are normally float charged by the photovoltaic system or the utility grid. The state-of-charge of these batteries is regulated by the utility-interactive inverter. With the batteries fully charged, excess energy (above local loads and battery charging requirements) from the photovoltaic system is delivered to the utility system. In the absence of the utility system (blackout or brownout), there is no place to route energy from the photovoltaic system that is in excess of the connected local loads. This excess energy from the photovoltaic system can quickly overcharge the batteries, causing them to generate high levels of hydrogen gas, dry out, possibly catch fire, and in the case of valve regulated batteries, go into thermal runaway. The same problems may occur if the inverter fails, is turned off or is removed from service. A second, independent method, of charge control is needed in these systems.

Panel Meeting Action: Accept
Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

13-62 Log #1125 NEC-P13 **Final Action: Reject**
(690-74)

Submitter: Robert Schultze, Electron Connection

Recommendation:

Revise as follows:
Flexible cables, as identified in Article 400 and listed welding cable meeting the requirements of Article 630 IV shall be permitted within the battery enclosure from battery terminals to a nearby junction box, where they shall be connected to an approved wiring method. Flexible battery cables shall also be permitted between batteries and cells within the battery enclosure. Such cables shall be listed for hard service use and identified as moisture resistant.

Substantiation:

U.L. Listed Welding cable is readily available, and is the most appropriate material to use as battery interconnects. Welding Cable is listed for hard usage, is moisture resistant, and is sometimes specifically listed as acid resistant. It is finely stranded and very flexible. It comes in ratings of up to 600 volts. It is the standard for battery interconnects in telecommunications, and also the preferred material for interconnects by many experienced renewable energy installers. Battery suppliers sell interconnects made from welding cable. Although welding cable is not permitted by the NEC, it is used extensively. Battery interconnects from national RE equipment suppliers are still often made from welding cable. It would be desirable to synchronize the NEC with a safe practice that is in common use. It is often desirable and safe to utilize welding cable in sizes smaller than 2/0, as is demonstrated by its use in the telecommunications industry.

Panel Meeting Action: Reject
Panel Statement:

Welding cable is not designed or tested for this use. This is a listing issue, not a code issue.

Number Eligible to Vote: 16
Ballot Results: Affirmative: 16

13-63 Log #1381 NEC-P13 (690-74) **Final Action: Reject**

Submitter: Drake Chamberlin, Electrical Energy Contracting and Consulting / Rep. Independent Power Providers-Renewable Power Installers

Recommendation:

Revise text to read as follows:
Flexible cables, as identified in Article 400 and listed welding cable meeting the requirements of Article 630 IV., in sizes 2/0 AWG and larger, shall be permitted within the battery enclosure from battery terminals to a nearby junction box, where they shall be connected to an approved wiring method. Flexible battery cables shall also be permitted between batteries and cells within the battery enclosure. Such cables shall be listed for hard service use and identified as moisture resistant.

Substantiation:

UL Listed Welding cable is readily available, and is the most appropriate material to use as battery interconnects, Welding Cable is listed for hard usage, is moistures resistant, and is sometimes specifically listed as acid resistant. It is finely stranded and very flexible. It comes in ratings of up to 600 volts. It is the standard for battery interconnects in telecommunications, and also the preferred material for interconnects by many experienced renewable energy installers. Although welding cable is not permitted by the NEC, it is used extensively. Battery interconnects from national RE equipment suppliers are still often made from welding cable. It would be desirable to synchronize the NEC with a safe practice that is in common use.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-62.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-64 Log #3480 NEC-P13 (690-74) **Final Action: Reject**

Submitter: Drake Chamberlin, Electrical Energy Contracting & Consulting / Rep. Independent Power Providers-Renewable Power Installers Advocacy Program (See page 2354)

Recommendation:

Revise text as follows:
Flexible cables, as identified in Article 400 and listed welding cable meeting the requirements of Article 630 IV shall be permitted within the battery enclosure from battery terminals to a nearby junction box, where they shall be connected to an approved wiring method. Flexible battery cables shall also be permitted between batteries and cells within the battery enclosure. Such cables shall be listed for hard service use and identified as moisture resistant.

Substantiation:

UL Listed Welding cable is readily available, and is the most appropriate material to use as battery interconnects. Welding Cable is listed for hard usage, is moisture resistant, and is sometimes specifically listed as acid resistant. It is finely stranded and very flexible. It comes in ratings of up to 600 volts. It is the standard for battery interconnects in telecommunications, and also the preferred material for interconnects by many experienced renewable energy installers. Battery suppliers sell interconnects made from welding cable. Although welding cable is not permitted by the NEC, it is used extensively. Battery interconnects from national RE equipment suppliers are still often made from welding cable. It would be desirable to synchronize the NEC with a safe practice that is in common use. It is often desirable and safe to utilize welding cable in sizes smaller than 2/0, as is demonstrated by its use in the telecommunications industry.
Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-62.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-65 Log #1475 NEC-P13 **Final Action: Reject**
(690-90 (New))

Submitter: Nicholas P. Ludlam, FM Approvals

Recommendation:

Add new text as follows:
690.90 Hazardous (Classified) Locations.
Solar Photovotaic systems, equipment or wiring installed in a hazardous (classified) location, shall also comply with the requirements of Articles 500 through 516.

Substantiation:

Solar Photovotaic systems are listed for use in a Class I Division 2 Hazardous (classified) location and there is no reason why they can't be listed for Class I Division 1. Article 690 does not have any requirements for hazardous (classified) locations.

Panel Meeting Action: Reject

Panel Statement:

Any equipment located in a hazardous location as recognized by Article 500 must meet these requirements. It is not necessary to replicate the need in this article.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-66 Log #301 NEC-P13 **Final Action: Reject**
(692-1)

Submitter: Tom Lavka, Metallic Power, Inc.

Recommendation:

Add new text as follows:
This article identifies the requirements for the installation of fuel cell power systems supplying AC power, which may be stand-alone or interactive with other electrical power production sources and may be with or without electrical energy storage such as batteries.

Substantiation:

Although not specifically stated, the wording of the entire Article 692 implies AC power and not DC power, i.e., 692.41(A) references 250.30 "Grounding Separately Derived Alternating-Current Systems." Metallic Power may produce a DC fuel cell product and requires clarification that Article 692 is indeed intended only for AC installations.

Panel Meeting Action: Reject

Panel Statement:

Article 692, as originally drafted, was intended to cover all fuel cell systems; not just ac systems. A dc fuel cell system is not exempted from the requirements of the NEC. See Proposal 13-67.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-67 Log #3379 NEC-P13 **Final Action: Accept**
(692-1)

TCC Action:

The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Accepts" the Panel Action.

Submitter: Kenneth Krastins, Plug Power Inc.

Recommendation:

Add the following sentence at the end of 692.1:
These systems may have ac or dc output for utilization.

Substantiation:

Fuel cells have a dc output, which may be inverted into an ac output or converted (via a dc-dc converter) to a usable dc output. The proposed wording, taken from 690.1, reflects that.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-68 Log #2276 NEC-P13 **Final Action: Reject**
(692-8(C))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
692.8 Circuit Sizing and Current.
(A) Nameplate Rated Circuit Current. The nameplate(s) rated circuit current shall be the rated current indicated on the fuel cell nameplate(s).
(B) Conductor Ampacity and Overcurrent Device Ratings. The ampacity of the feeder circuit conductors from the fuel cell system(s) to the premises wiring system shall not be less than the greater of (1) nameplate(s) rated circuit current or (2) the rating of the fuel cell system(s) overcurrent protective device(s).
(C) Ampacity of ~~Grounded~~ Earth ~~or Neutral~~ Conductor. If interactive single-phase, 2-wire fuel cell output(s) is connected to the ~~grounded~~ earth ~~or neutral~~ conductor and a single ungrounded conductor of a 3-wire system or of a 3-phase, 4-wire wye-connected system, the maximum unbalanced neutral load current plus the fuel cell system(s) output rating shall not exceed the ampacity of the ~~grounded~~ earth ~~or neutral~~ conductor.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated it's desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-69 Log #2824 NEC-P13 **Final Action: Accept**
(692-15 (New))

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Add a new Section 692.15 to read as follows:
692.15 Requirements for Disconnecting Means of Inverter Output Circuit. Means shall be provided to disconnect all conductors of the fuel cell system output circuit from the point of common coupling. A single disconnecting means in accordance with 692.17 shall be permitted for the combined AC output of one or more inverters. Disconnect shall be adjacent to or grouped with the utility disconnecting means at the point of common coupling.

Substantiation:

Given that most utilities are requiring the installation of disconnecting means to allow manual separation of photovoltaic output circuit(s) and the electrical production and distribution network, it stands to follow that as fuel cell systems are installed they will be required to follow the same requirements as photovoltaic systems. Frequently, the disconnecting means specified in the NEC does not require a disconnecting means to be installed exterior to the building or structure to allow "line crews" to manually "lock out" fuel cell output circuit conductors.
Comment:
Although the inverters supplied today are equipped with a fuel cell output circuit manual disconnects, they are often not accessible to line crews performing work upon the distribution network. Frequently, line crews are not aware of a fuel cell system location or disconnecting means. This method gives a visual indication to prevent accidental injury or death from an inverter malfunction, i.e., islanding. The software and hardware utilized in inverters today are not capable of verifying the condition of its "tie" with the local utility. For example, the software and hardware design does not allow for the inverter to verify that a disconnect has been performed when needed. The inverter may attempt and satisfy its control algorithm(s), but may not have actually performed them. "Deterministic" diagnostics are needed before a software only controlled disconnect is sufficient. In addition, alarms (visual or audible) are not present to warn of this condition. As inverters are today, when a loss of utility power is detected an inverter must disconnect its fuel cell output circuit(s) from the utility grid. This action may be attempted through a software initiated disconnect but there is no way to visually verify that it is performed. In addition, software initiated disconnects are not 100 percent reliable. In the advent of a false detection of utility grid power an inverter will attempt to reconnect its fuel cell output circuits. Also, software controlled disconnecting means are susceptible to closing or opening its control point of interaction due to stray voltages or noise impressed upon the inverter without a command to do so.
Case example: A software controller can be made to close its (output) point on an industrial grade controller by introducing grounding and static noise interference upon the controller. The result is that a "digital" output point controlling an external disconnecting means can be made to close without instructions from the controller. This is the event this addition is seeking to rectify.
It is hoped that the utility providers will recognize this requirement and implement further visual indications of fuel cell and other power sources contained within the building or structure. For example, utilities could require that photovoltaic, fuel cell and other power sources that are supplying power that may be backfed onto the grid be identified by the use of a "green" weatherhead, transformer case, or other visible methods.
This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Accept
Panel Statement:

Number Eligible to Vote: 16
Ballot Results: Affirmative: 14 Negative: 2

Explanation of Negative:

BOWER: The requirements as submitted may not be practical or possible with many commercial installations. For instance, a fuel cell system on an upper floor of a multi-story building could not have its disconnect located or grouped with the utility disconnecting means at the point of common coupling that is typically in a lower level of the building. The location of the disconnect device should not be required to be at the point of common coupling.
This requirement could be written with language similar to those appearing in Article 690 and be worded to say:
692.15 Requirements for Disconnecting Means of Inverter Output Circuit. Means shall be provided to disconnect all conductors of the fuel cell system output circuit from the point of common coupling. A single disconnecting means in accordance with 692.17 shall be permitted for the combined AC output of one or more inverters.
KRASTINS: The proposed change consists of adding a new section, 692.15, containing three sentences. The first proposed new sentence is essentially a reiteration of the first sentence of 692.13. If a fuel cell system is disconnected from all other conductors in a building or other structure, it will necessarily be disconnected from the Point of common coupling (PCC). The second new sentence of the proposal states only that the following section, 692.17, is applicable. So, it is only the third and last sentence of this proposal that provides any new substantial changes to the code and to which the following comments are addressed.
Before proceeding, it is important to clarify to what equipemtn the wording of the proposed change applies. At the January meeting of CMP 13, there was some question as to whether the proposed wording applied to the output breaker of the fuel cell itself or the utility disconnect switch that allows a utility worker to isolate the fuel cell system from the grid. In a telephone conversation on February 11, 2003, it was confirmed by the submitter of the proposal that the disconnecting means referred to in the proposal is the generator (fuel cell) disconnect switch. This disconnecting means is indicated in the diagram provided. The "utility disconnecting means" referred to in the last sentence of the propsal is the customer meter. A diagram with terminology consistent with the proposal is provided at the end of these comments to further clarify the equipment addressed in the proposal.
The third, and last, new sentence of the proposal requires the fuel cell disconnect switch to be located "adjacent to or grouped with the utility disconnecting means at the point of common coupling." The wording is somewhat ambivalent as a lot of current state regulatory language refers to the disconnect switch as the "uttility disconnect switch," and so the wording would read to some that the utility disconnecting means needs to be located adjacen to the utility disconnecting means. Please note that the IEEE Standards Coordinating Committee (SCC) 21 currently developing the IEEE P5147 national standard for interconnecting distributed resources with electric power systems specifically removed any language from the draft of that document that referred to the customer meter as the disconnecting means for the utility. But even if the ambivalence of the language in the proposal is set aside, there are still fundamental

reasons why this proposal should be rejected.

Proposal 13-37, which is the very same proposal as 13-69 but applied to the Pholovoltaic (PV) Article 690, was rightly rejected by the panel at the January meeting. It was recognized that PV systems may be located great distances from the PCC, and that to impose this requirement on PV systems is impractical in most commercial installations. It was argued by the submitter's representative at the ROP CMP meeting that proposal 13-69 should be accepted because while PV systems may be located great distances from the PCC, fuel cell systems are not. But this is absolutely untrue. Fuel cells, the same as any Distributed Resource (DR), may be located many feet, tens of yards, or, in some cases, even miles from the PCC. It is precisely the capability of locating a DR close to the load(s) it serves without having to run great lengths of calbe that is one of its most attractive features.

Both fuel cells and photovoltaic systems output DC power that is inverted, if the application is for an ac system. There is no technical justification for permitting the disconnecting means of a photovoltaic system to be physically located close to the inverter output while imposing a requirement for fuel cell systems that their disconnecting means must be located adjacent to the PCC. State regulatory agencies and the IEEE P1547 working group have recognized this and apply the same disconnecting means requirements for fuel cell systems as they do for photovoltaics. Additionally, many state interconnection requirements as well as the draft of IEEE P1547 use this disconnecting means as a way for utilities to quickly verify the anti-islanding function of the inverters. This is done by opening up the disconnecting means verifying that the inverter has ceased to export power, reclosing the disconnecting means back into a live system, and then verifying that the inverter does not export power until after a specified period of time has elapsed. By requiring the disconnecting means to be located potentially great distances from the fuel cell system, this proposed change would hinder the performance of this test, which is becoming adopted in increasing numbers of jurisdictions.

It is also a restriction of trade to impose the requirement that the disconnecting means must be located adjacent to the PCC for fuel cell systems only. This unfairly disadvantages fuel cells as compared to other types of DR. Most state interconnection regulations do not specify the location of the disconnecting means. In states where they do, the potential benefit of locating DRs away from the PCC is recognized and permitted. In New York State, for example, the Public Service Commission's (PSCs) Standardized Interconnection Requirements (SIR) state (for all DRs; not just photovoltaics) that "The disconnect switch shall be located within 10 ft of the utility's external electric service meter. If such location is not possible, the customer-generator will propose, and the utility will approve, an alternate location. The location and nature of the disconnect shall be indicated in the immediate proximity of the electric service entrance. The disconnect switch shall be readily accessible for operation and locking by utility personnel in accordance with Section II.B, Operating Requirements."

There have been many fuel cell systems successfully installed with the approval of the local utility permitting identification of the disconnect location at the PCC without any compromise of safety. I respectfully request the panel to reconsider their position and reject his proposal so that similar contracts may be entered into for fuel cell systems by all parties in the future without conflicting with the requirements of the National Electrical Code.

NOTE: Supporting Material is available for review at NFPA Headquarters.

Comment on Affirmative:

ELKINS: The proposal requirement that the disconnect be located "adjacent to or grouped with the utility disconnect" is not possible in many large industrial applications. Exception to this requirement should be provided in the NEC for these facilities.

HORNBERGER: Interconnected Electric Power Production Source disconnect requirements should be similar for different types of sources. The requirement to group disconnects with the utility service disconnect is not required for photovoltaic systems. These common areas of concern for all alternative electric supply sources should be addressed in Article 705. The issue should only be repeated in individual power source articles where technical justification can be presented which requires a modification of Article 705. The Proposal should be forwarded to CMP 4 for information.

STAFFORD: By establishing a standard for disconnecting means, a single point of disconnect shall be available for utility and fire personnel. The action taken by the panel in this proposal is agreed with and the proposal submitted: 13-37 for 690-14(D) reflects the same intent.

13-70 Log #3381 NEC-P13 **Final Action: Reject**
(692-41)

Submitter: Kenneth Krastins, Plug Power Inc.

Recommendation:

Revise the wording of 692.41 as follows:
692.41 System Grounding.
~~For a fuel cell system output circuit, one conductor of a 2-wire system rated over 50 volts and a neutral conductor of a 3-wire system shall be solidly grounded by either 692.41(A) or (B).~~
Grounding of all system types shall be in accordance with Article 250.
~~(A) Stand-Alone Systems. Grounding and bonding shall be in accordance with 250.30.~~
(A) AC Systems.
(1) Non-Separately Derived Systems. Grounding of non-separately derived ac systems shall be in accordance with 250.20. For single-phase systems, one conductor of a two-wire system or the neutral conductor of a bipolar three-wire system shall be terminated at the grounded circuit conductor terminal of the premises wiring system. A three-wire, three-phase, non-separately derived system shall not require a neutral ground.
(2) Separately Derived Systems. Grounding of separately derived ac systems shall be in accordance with 250.30.
~~(B) Other Than Stand-Alone Systems.~~
(B) DC Systems.
~~(1) Two-Wire Systems. One conductor shall be terminated at the grounded circuit conductor terminal of the premises wiring system.~~
(1) Non-Separately Derived Systems. Grounding of non-separately derived dc systems shall be in accordance with 250.160.
~~(2) Three-Wire Systems. The neutral conductor shall be terminated at the grounded circuit conductor terminal of the premises wiring system.~~
(2) Separately Derived Systems. Grounding of separately derived dc systems shall be in accordance with 250.169.

Substantiation:

1) Fuel cells may be stand-alone or other than stand alone. Their utilization outputs may be separately derived or non-separately derived, ac or dc, single-phase or three-phase.
2) The current language in 692.41 does not have grounding provisions for fuel cell systems with dc outputs. The proposed language adds those requirements.
3) The current language in 692.41 does not have grounding provisions for fuel cell systems with three-phase outputs. The proposed language adds those requirements.
4) For fuel cell systems with a 2-wire output conductor, the current language of 692.41 addresses systems rated over 50 volts only. The proposed language expands the coverage of the section to all 2-wire systems as well as other types of systems.
5) Previously sited three-phase systems have been effectively installed without requiring a neutral ground for three-wire, three-phase, non-separately derived fuel cell systems.

Panel Meeting Action: Reject

Panel Statement:

These requirements are currently covered in Article 250.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 14 Negative: 2

Explanation of Negative:

KRASTINS: The panel comment to reject this proposal indicated that the grounding requirements are already contained in 250. Although I recognize that the National Electrical Code is not a training manual, one of the main reasons for originally adding 692 to the Code was to clearly address questions that were being raised by inspectors during installation of fuel cell systems. Many were unclear as to whether the NEC even applied to fuel cell installations or, if it did, exactly how it applied. So, while the Code is not a training manual, 692 has served multiple purposes, including providing guidance to code officials on interpretation of the Code as it relates to the installation of fuel cell systems.
The fuel cell systems 692 applies to both ac and dc systems. The panel action taken on proposals 13-66 and 13-67 amplified that fact. Currently 692.41 provides requirements for grounding of fuel cell systems, but the current language provides requirements for with ac outputs only. Proposal 13-70 was submitted to close the loop and provide the companion grounding requirements for dc fuel cell systems. To avoid future misinterpretations due to the current article containing requirements for ac systems only, I respectfully request the panel to reconsider accepting this proposal in principle with the following wording for greater clarity and improved understanding.
692.41 System Grounding.
~~For a fuel cell system output circuit, one conductor of a 2-wire system rated over 50 volts and a neutral conductor of a 3-wire system shall be solidly grounded by either 692.41(A) or (B).~~
Grounding of all system types shall be in accordance with Article 250.
~~(A) Stand-Alone Systems. Grounding and bonding shall be in accordance with 250.30.~~
(A) AC Systems. Grounding of ac systems shall be in accordance with 250.20. For single-phase systems, one conductor of a two-wire system or the neutral conductor of a bipolar three-wire system shall be terminated at the grounded circuit conductor terminal of the premises wiring system. A three-wire, three-phase, system shall not require a neutral ground.
~~(B) Other Than Stand-Alone Systems.~~
~~(1) Two-Wire Systems. One conductor shall be terminated at the grounded circuit conductor terminal of the premises wiring system.~~
(B) DC Systems. Grounding of dc systems shall be in accordance with 250.160.
~~(2) Three-Wire Systems. The neutral conductor shall be terminated at the grounded circuit conductor terminal of the premises wiring system.~~
WOOD: I believe it was the Panel's intent to remove 692.41 in its entirety, not just to reject the proposal as submitted. See Panel Statement.

Comment on Affirmative:

KOVACIK: I am in support of the panel statement, and agree with the comments in Mr. Wood's Explanation of Negative Vote. The grounding requirements are included in Article 250.

13-71 Log #2277 NEC-P13 **Final Action: Reject**
(692.41(B) (1) & (2))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
692.41 System Grounding. For a fuel cell system output circuit, one conductor of a 2-wire system rated over 50 volts and a neutral conductor of a 3-wire system shall be solidly grounded by either 692.41(A) or (B).
(A) Stand-Alone Systems. Grounding and bonding shall be in accordance with 250.30.
(B) Other Than Stand-Alone Systems.
(1) Two-Wire Systems. One conductor shall be terminated at the ~~grounded~~ earth circuit conductor terminal of the premises wiring system.
(2) Three-Wire Systems. The neutral conductor shall be terminated at the ~~grounded~~ earth circuit conductor terminal of the premises wiring system.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-72 Log #1999 NEC-P13 **Final Action: Reject**
(692-44)

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
692.44 Equipment ~~Grounding~~ Bonding Conductor. A separate equipment ~~grounding~~ bonding conductor shall be installed.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See the panel action and statement on Proposal 13-1.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: "Grounded" and "grounding" sound similar but are intended to describe two totally different concepts. However, these terms are often used interchangeably by users of the NEC. In fact, there are places in the NEC where these terms are used interchangeably. The words ground, grounded and grounding will apply to the concept of connecting an electrical system to the earth. While the words bond, bonded and bonding will apply to the concept of connecting together noncurrent carrying conductive parts likely to become energized so that they form an effective ground fault path back to the source. If the terms are not similar, the concepts can be more easily differentiated by the users. This change will greatly improve usability and understanding of the NEC. This issue needs to be brought forth through the Technical Correlating Committee and the use of the individual terms should be evaluated on their merit on a case-by-case basis.
For example, the term ground fault used in the above paragraph describes a particular type of electrical fault and is used appropriately in the above text.

13-73 Log #2000 NEC-P13 **Final Action: Reject**
(692-45)

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
692.45 Size of Equipment ~~Grounding~~ Bonding Conductor. The equipment ~~grounding~~ bonding conductor shall be sized in accordance with 250.122.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See the panel action and statement on Proposal 13-1.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: "Grounded" and "grounding" sound similar but are intended to describe two totally different concepts. However, these terms are often used interchangeably by users of the NEC. In fact, there are places in the NEC where these terms are used interchangeably. The words ground, grounded and grounding will apply to the concept of connecting an electrical system to the earth. While the words bond, bonded and bonding will apply to the concept of connecting together noncurrent carrying conductive parts likely to become energized so that they form an effective ground fault path back to the source. If the terms are not similar, the concepts can be more easily differentiated by the users. This change will greatly improve usability and understanding of the NEC. This issue needs to be brought forth through the Technical Correlating Committee and the use of the individual terms should be evaluated on their merit on a case-by-case basis.
For example, the term ground fault used in the above paragraph describes a particular type of electrical fault and is used appropriately in the above text.

13-74 Log #2001 NEC-P13 **Final Action: Reject**
(692-47)

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
692.47 Grounding Electrode System. Any supplementary grounding electrode(s) required by the manufacturer shall be connected to the equipment ~~grounding~~ bonding conductor specified in 250.118.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See the panel action and statement on Proposal 13-1.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

HORNBERGER: "Grounded" and "grounding" sound similar but are intended to describe two totally different concepts. However, these terms are often used interchangeably by users of the NEC. In fact, there are places in the NEC where these terms are used interchangeably. The words ground, grounded and grounding will apply to the concept of connecting an electrical system to the earth. While the words bond, bonded and bonding will apply to the concept of connecting together noncurrent carrying conductive parts likely to become energized so that they form an effective ground fault path back to the source. If the terms are not similar, the concepts can be more easily differentiated by the users. This change will greatly improve usability and understanding of the NEC. This issue needs to be brought forth through the Technical Correlating Committee and the use of the individual terms should be evaluated on their merit on a case-by-case basis.
For example, the term ground fault used in the above paragraph describes a particular type of electrical fault and is used appropriately in the above text.

13-75 Log #302 NEC-P13 **Final Action: Accept in Principle**
(692-54)

Submitter: Tom Lavka, Metallic Power, Inc.

Recommendation:

Revise text to read as follows:
For fuel cell systems fueled from a source external to the system. ~~The location of the~~ A manual shutoff valve shall be at the location of the primary disconnecting means of the building or circuits supplied.

Substantiation:

Metallic Power's product is a stand alone, prepackaged and self-contained plant powered by a noncombustible fuel. There is no practical way to install a remote manual shutoff valve, and questionable value or improved safety from use of such a valve based on the use of noncombustible fuel.
Further revision/formal interpretation of 692.54 is requested to appropriately apply this requirement only to fuel cell technologies that are powered by a fuel source external to the system and perhaps also using combustible fuels.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action on Proposal 13-76. This meets the submitter's intent.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-76 Log #3380 NEC-P13 **Final Action: Accept**
(692-54)

Submitter: Kenneth Krastins, Plug Power Inc.

Recommendation:

Add the word "marked" to 692.54 so that it reads:
The location of the manual fuel shutoff valve shall be marked at the location of the primary disconnecting means of the building or circuits supplied.

Substantiation:

This is an editorial correction. The word "marked" was inadvertently left off of the version of this section that went for publication.

Panel Meeting Action: Accept

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

13-77 Log #2825 NEC-P13 **Final Action: Reject**
(692-60)

Submitter: Michael I. Callanan, NJATC / Rep. IBEW

Recommendation:

Revise 692.60 by adding a new second sentence to read as follows:
692.60 Identified Interactive Equipment. Only fuel cell systems listed and identified as interactive shall be permitted in interactive systems. Where interactive system(s) may operate as a stand-alone system through bypassing the inverter, disconnecting means shall indicate normal and bypass positions.

Substantiation:

Inverters may operate in a "bypass" mode where AC power is routed through the inverter to critical loads. Presently, some disconnecting means indicate an "off" position but allow AC utility power to supply loads driven by the inverter.
The intent here is not to prevent inverters from operating in the bypass mode but rather to have marking indicate when an inverter is operating in a bypass mode. Inverters can still supply loads through the connection marked "off" and present a real hazard. Inverters should be able to operate in the "bypass" mode to allow maintenance to be performed upon the inverter, but the markings on the disconnecting means should indicate "Bypass". (Reference 690.56 Interactive System Point of Interconnection. Inverters available today for photovoltaic systems are the same utilized for fuel cell systems).
This proposal represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 13-52.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 15 Negative: 1

Explanation of Negative:

STAFFORD: Inverters may operate in a "Bypass" mode where AC power is routed through the inverter to critical loads. Presently some disconnecting means indicate an "off" position but allow AC Utility Power to supply loads driven by the inverter. The intent here is not to prevent inverters from operating in the bypass mode but rather to have marking indicate when an inverter is operating in a bypass mode. Some inverters on the market today and distributed under the 2002 NEC have markings on the disconnecting means which state "off". These inverters can still supply loads bypassing the inverter through the connection marked "off" and present a real hazard. Inverters should be able to operate in the "bypass" mode to allow maintenance to be performed upon the inverter, but the markings on the disconnecting means should indicate "Bypass".

13-78 Log #1343 NEC-P13 **Final Action: Reject**
(695-1(A)(1))

Submitter: R. Schneider Lancaster, SC

Recommendation:

Add "7.2 kV Max." to end of sentence so as to read:
(1) Electric power sources and interconnecting circuits 7.2 kV Max.

Substantiation:

Present Article 695 verbiage, overcurrent coordination, NFPA 20 references and NEC references are compatible with utilization voltages up to 7.2 kV >600V fire pump controllers are permitted per 7-6, NFPA 20.

Panel Meeting Action: Reject

Panel Statement:

NFPA 20 does not limit the electric power sources and interconnecting circuits to 7.2 kV. NFPA 20 provides provisions for greater than 600 volts. There is no reason that higher voltage equipment can not be used. No supporting documentation to setting the voltage limit 7.2kV.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-79 Log #553 NEC-P13 **Final Action: Accept**
(695-2–Fault Tolerant External Control Conductors)

Submitter: Technical Committee on Fire Pumps

Recommendation:

Revise the definition in 695.2 for Fault Tolerant External Control Conductors by changing the word "conductors" in the title and definition so that it reads as follows:
Fault Tolerant External Control Circuits. Those control circuits entering and/or leaving the fire pump controller enclosure, which if broken, disconnected, or shorted will not prevent the controller from starting the fire pump from all other internal or external means and may cause the controller to start the pump under these conditions.

Substantiation:

Circuits, not conductors is the correct term. Fault tolerant applies to the entire circuit, not just the conductors.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-80 Log #1385 NEC-P13 **Final Action: Reject**
(695-3, 695.4, 695.7, 695.10, 695.14)

Submitter: Richard Fransen, Daiken America, Inc.

Recommendation:

Delete "NFPA 20" wherever used in mandatory code language.

Substantiation:

Paragraph 4.2 of the 2001 NEC Style Manual prohibits direct reference to another NFPA standard in mandatory code language.
"4.2 References to Other Standards. References to other standards shall not be in mandatory Code text. References to product standards shall be in an informative annex. References to other Standards shall be in the Fine Print Notes."

Panel Meeting Action: Reject

Panel Statement:

This is necessary because of the NEC Style Manual extract policy in Section 4.3. See the FPN following the title of Article 695.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-81 Log #471 NEC-P13 **Final Action: Reject**
(695-3(A))

Submitter: Joe L. DuPriest, Reedy Creek Improvement District

Recommendation:

Revise as follows:
"... the power source for an electric motor-driven fire pump shall be (~~one~~) (two) or more of the following."

Substantiation:

As written, if available, a single source could be used to provide power to a fire pump motor, however many utilities are no longer and will not accept the responsibility of being the single reliable source of power. Examples are rolling brownout in California.

Panel Meeting Action: Reject

Panel Statement:

Section 695.3(A) specifies "Where reliable" sources are available one or more of the alternatives are adequate. If the power source is not reliable then 695.3(B) Multiple Sources applies. The submitter states that many utilities will not accept the responsibility of being a single reliable source of power. For these types of installations Section 695.3(B) applies. For those installations where a reliable source of power is available, a single source is adequate.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-82 Log #1360 NEC-P13 **Final Action: Accept**
(695-3(A)(1))

Submitter: J. Kevin Vogel, Crescent Electrical Supply

Recommendation:

Revise text to read as follows:
(1) Electric Utility Service Connection. A fire pump shall be permitted to be supplied by a separate service, or ~~by~~ from a ~~top~~ connection located ahead...

Substantiation:

The use of the word "tap" is inappropriate since the definition of "tap conductors" in 240.2 conflicts with what is intended in 695.3(A)(1).

Panel Meeting Action: Accept

Panel Statement:

The panel agrees wth the submitter's recommendation except the panel notes that tap conductor as defined in Article 240 only applies to that article.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-83 Log #2776 NEC-P13 **Final Action: Reject**
(695-3(A)(2) (New))

Submitter: Randy Roberts, Carr and Duff Co

Recommendation:

Renumber existing 695.3(A)(2) as 695.3(A)(3) and add the following:
(2) Electric Utility Connection for Services Over 600 Volts. Where a building has a service operating above 600 Volts, a fire pump shall be permitted to be connected at the secondary terminals of a transformer, ahead of any secondary disconnects for the building, provided the over 600 Volt service disconnect, transformer disconnect and transformer are located outside the building.

Substantiation:

This fire pump connection would be permitted by 695.3(A)(1) for low voltage services where the utility is responsible for the high voltage supply and the transformer. Addition of a high voltage service switch ahead of the transformer will not affect the reliability of the fire pump supply, as long as the switch and transformer are outside the building, and the feed to the building is installed as a service. Many utilities offer high voltage services. Requiring a separate high voltage switch and transformer for the fire pump is not consistent with the reliability provided by an outdoor utility owned and operated transformer.

Panel Meeting Action: Reject

Panel Statement:

Section 695.3(A)(1) now allows the connection ahead of the service disconnects to the building. The utility owned transformer is the point of service and connecting the fire pump supply directly to the transformer terminals ahead of the disconnects meets the intent of the Article. There is no need for specific details for one particular installation.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

HORNBERGER: This proposal should be accepted. The panel's statement confirms the issue raised by the submitter. For a low voltage service, where the utility is responsible for the transformer, 695.3(A)(1) permits a fire pump's utility supply to be connected ahead of the service disconnecting means, between the utility owned transformer secondary terminals and the building's service disconnect. If a building is served above 600 volts, the premises service disconnect is redefined as the over 600 volt disconnect on the high voltage side of the transformer. The building is supplied by a low voltage feeder from the transformer. 695.3(A)(1) now requires an additional over 600 volt switch and a separate fire pump transformer to be installed and connected to the over 600 volt service conductors between the utility service point and the over 600 volt service disconnect. The difference between the two types of services is the addition of an over 600 volt service disconnect on the high voltage side of the transformer, both of which are under the control of the premises management. There is no difference in the reliability of service to the fire pump as long as the over 600 volt switch and transformer are located outside the building, available to emergency response personnel.

13-84 Log #1373 NEC-P13 **Final Action: Reject**
(695-3(A)(2) Exception (New))

Submitter: Wayne H. Robinson, Prince George County Government

Recommendation:

Add a new Exception to read as follows:
Exception: Where electric motors are used and the height of the structure is beyond the pumping capacity of the fire department apparatus a second source in accordance with 6.2.3 shall be provided.

Substantiation:

695.3(A)(2) Refers to [NFPA 20, 6.2.1, 6.2.2, 6.2.4.4] but fails to include the exception. This exception applies to buildings over 6 stories and is a significant requirement when applying provisions for electric motors used in fire pump applications.

Panel Meeting Action: Reject

Panel Statement:

This is a Fire Pump design requirement that appropriately belongs in NFPA 20 and not in the NEC. This requirement is adequately covered in NFPA 20. In addition, directional references to other standards shall not be in mandatory Code text.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-85 Log #2321 NEC-P13 **Final Action: Accept**
(695-4(B)(1))

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

Recommendation:

Add the following new sentence to the end of 695.4(B)(1).
695.4 Continuity of Power.
Circuits that supply electric motor-driven fire pumps shall be supervised from inadvertent disconnection as covered in 695.4(A) or (B).
(A) Direct Connection. The...
(B) Supervised Connection. A...
(1) A listed fire pump controller
(2) A listed fire pump power transfer switch
(3) A listed combination fire pump controller and power transfer switch
For systems installed...
(1) Overcurrent Device Selection. The overcurrent protective device(s) shall be selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors and any other devices in the fire pump motor circuit(s).
Note: This is a companion proposal to 695.4(B) and 695.5(C)(2).

Substantiation:

The requirement to size overcurrent protective devices to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s), the pressure maintenance pump motor(s), the full-load current of the associated fire pump accessory equipment, and in some cases the remaining loads supplied by the transformer is being applied incorrectly to conductors and other devices in the fire pump motor circuits.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Explanation of Negative:

BAKER: Already identified in 695.6(C).
HORNBERGER: The submitter provides no technical substantiation to support this proposal. The design basis for the fire pump motor circuit is to remain in service until the motor fails. That means coordinating the component damage curves with the motor thermal damage curves. Existing code adequately addresses this issue.

Comment on Affirmative:

FLACH: This is presently covered in 695.6(C)(1). Delete "... and any other devices...". Fuses and circuit breakers are "devices" by definition, and should not be limited to 125 percent.

13-86 Log #2547 NEC-P13 **Final Action: Accept**
(695-4(B)(2))

Submitter: Alan Manche, Schneider Electric/Square D

Recommendation:

Revise NEC 695.4(B)(2) with the additions (underlined) and deletions (strike through) as shown. The entire text of 695.4(B)(2) is shown for clarity, but only those changes shown underlined or strike through are part of this proposal. Add Item 3 and renumber the present item (3) as Item (4).

(2) Disconnecting Means. The disconnecting means shall
comply with all of the following:
(1) Be identified as suitable for use as service equipment
(2) Be lockable in the closed position
(3) Not be located within equipment that feeds loads other than the fire pump
(4) ~~(3)~~ Be located sufficiently remote from other building or other fire pump source disconnecting means such that inadvertent contemporaneous operation would be unlikely.

Substantiation:

Equipment manufacturers are requested to provide various panelboard and switchboard custom configurations from customers located across the country. Our experience has found the wording "located sufficiently remote" in the present 695.4(B)(2)(3) has a varying degree of interpretation across the country which includes: 1) located within a panelboard feeding various loads with the fire pump disconnect located at the bottom of the panel (sufficiently remote?), 2) located within a switchboard structure feeding various loads either at the bottom of a single section (sufficiently remote?) or in a separate section of an assembly (sufficiently remote?), 3) located as a separate enclosure.

Adding item (3) will clarify that a fire pump disconnect is not permitted in a panelboard or switchboard that feeds other loads in order to ensure continuity of power and further support the appropriate interpretation of "sufficiently remote" in newly numbered Item (4) above.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: The proposed language adds equipment, bus or conductors and connections on the circuit supplying the fire pump which lowers the circuit's reliability. This decrease in reliability is probably equal to any benefit derived from adding this additional panel board. Existing NEC language requiring a "sufficiently remote" location provides flexibility to minimize unneeded equipment and provides a disconnect which is unlikely to be mistaken for another.

13-87 Log #3002 NEC-P13 **Final Action: Reject**
(695-5(A))

Submitter: James R. Harvey, University of Michigan

Recommendation:

Add new (A) Location. Fire pump transformers shall be located in the same room as the fire pump.

Substantiation:

Transformers without secondary protection should be in a location subject to periodic examination by maintenance personnel.

Panel Meeting Action: Reject

Panel Statement:

It is not necessary to have a fire pump transformer installed in the same room as the fire pump. As long as the fire pump feeder conductors are installed in accordance with Article 695 the conductors are protected and the wire would be sized appropriately for the load. Depending on the voltage, the need, and the circumstances the transformer feeding a fire pump may be large, oil filled, or of an arrangement not suitable for the fire pump room. This could pose more of a safety hazard than having the protected feeders without overcurrent protection run between an outdoor transformer and the fire pump equipment.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-88 Log #2319 NEC-P13 **Final Action: Accept**
(695-5(B))

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

Recommendation:

Note: This is a companion proposal to 695.4(B)(1) and 695.5(C)(2).
Add the following new sentence to the end of 695.5(B).
695.5 Transformers.
(B) Overcurrent Protection. The primary overcurrent protective device(s) shall be selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply. Secondary overcurrent protection shall not be permitted. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors and any other devices in the fire pump motor circuit(s).

Substantiation:

The requirement to size overcurrent protective devices to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s), the pressure maintenance pump motor(s), the full-load current of the associated fire pump accessory equipment, and in some cases the remaining loads supplied by the transformer is being applied incorrectly to conductors and other devices in the fire pump motor circuits.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Explanation of Negative:

BAKER: Already identified in 695.6(C).
HORNBERGER: The submitter provides no technical substantiation to support this proposal. The design basis for the fire pump motor circuit is to remain in service until the motor fails. That means coordinating the component damage curves with the motor thermal damage curves. Existing code adequately addresses this issue.

Comment on Affirmative:

FLACH: Presently covered by 695.6(C)(2). Delete "... and any other devices...". Fuses and circuit breakers are devices that must carry locked rotor current continuously.

13-89 Log #2320 NEC-P13 **Final Action: Accept**
(695-5(C)(2))

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

Recommendation:

Note: This is a companion proposal to 695.4(B)(1) and 695.5(B).
Add the following new sentence to the end of 695.5(C)(2).
695.5 Transformers.
(C) Feeder Source.
(2) Overcurrent Protection. The transformer size, the feeder size, and the overcurrent protective device(s) shall be coordinated such that overcurrent protection is provided for the transformer in accordance with 450.3 and for the feeder in accordance with 215.3, and such that the overcurrent protective device(s) is selected or set to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s), the pressure maintenance pump motor(s), the full-load current of the associated fire pump accessory equipment, and 100 percent of the remaining loads supplied by the transformer. The requirement to carry the locked-rotor currents indefinitely shall not apply to conductors and any other devices in the fire pump motor circuit(s).

Substantiation:

The requirement to size overcurrent protective devices to carry indefinitely the sum of the locked-rotor current of the fire pump motor(s), the pressure maintenance pump motor(s), the full-load current of the associated fire pump accessory equipment, and in some cases the remaining loads supplied by the transformer is being applied incorrectly to conductors and other devices in the fire pump motor circuits.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Explanation of Negative:

BAKER: Already identified in 695.6(C).
HORNBERGER: The submitter provides no technical substantiation to support this proposal. The design basis for the fire pump motor circuit is to remain in service until the motor fails. That means coordinating the component damage curves with the motor thermal damage curves. Existing code adequately addresses this issue.

Comment on Affirmative:

FLACH: See my affirmative comments on Proposals 13-85 and 13-88.

13-90 Log #1415 NEC-P13 (695-6) **Final Action: Reject**

Submitter: R. Schneider Lancaster, SC

Recommendation:

Change paragraph title from "Power Wiring" to "Power Circuit".

Substantiation:

The reason is that it has little to do with the actual wiring (conductors) and more to do with PROTECTION and Exceptions to PROTECTION of the POWER CIRCUIT.

It states: Power circuits and wiring methods shall comply with the requirements in 695.6(A) through (G) and as permitted in 230.90(A) Exception 4 — let's stop at this point. 230.90 is on Overcurrent Protection and Exception 4 pertains to fire pumps. Let's continue with 695.6 which next mentions 230.94 Exception 4.

230.94 Exception 4 gives specific instructions on overcurrent device location for fire pumps — I have no problem with that. Let's continue with 695.6 which next mentions 230.95 Exception 2.

230.95 Exception 2 exempts fire pumps from having ground fault protection — I have no problem with that. Let's continue with 695.6 which next mentions 240.13 Note 3.

240.13 (Note 3) (which is shown out of order) further exempts fire pumps from ground fault protection that doesn't exist because we have already exempted per 230.95. Let's continue with 695.6 which next mentions 230.208.

230.208 (S.C protection requirements which requires 6 times conductor ampacity — That seems incorrect since we want to coordinate with the FPC CB per 240.101. I think this reference should be deleted. Let's continue with 695.6 which next mentions 240.4(A).

240.4(A) which is on the subject of protection of conductors and specifically exempts fire pumps by steering the reader to NFPA 20. Let's continue with 695.6 which next mentions 430.31.

430.31 which pertains to branch circuit overload protection and specifically exempts fire pumps via FPN by steering the reader to NFPA 20.

All these pertain to protection (or exemptions thereof) which the reader does not get out of the title of the paragraph. It is realized that the paragraph immediately before, namely 695.5(C)(2) is on Overcurrent Protection but that pertains to transformers.

Panel Meeting Action: Reject

Panel Statement:

The submitter discussed and referenced all of the articles,230.90(A), Exception No. 4; 230.94, Exception No. 4; 230.95, Exception No. 2; 240.13; 230.208; 240.4(A); and 430.31., stating that these articles would indicate that 695.6 only addresses power circuits. The referenced articles permits the type of power wiring used for fire pumps. The basic material covered in 695.6(A) through (G) is power wiring while the references give the authority and need for this type of wiring. The submitter suggests that 230.208 seems incorrect and should be deleted. Section 230.208 should not be deleted in that it provides the provision for short circuit protection while 240.101 applies to overcurrents.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-91 Log #1596 NEC-P13 (695-6) **Final Action: Reject**

Submitter: R. Schneider Lancaster, SC

Recommendation:

Revise 695-6 as follows:

695.6 Power Circuit. Power circuits and wiring methods shall comply with the requirements in 695.6(A) through (G) and the provisions mandated in the following:

Overload protection exemption per 230.90 Exception 4, 240.4(A) and 430.31.

Location of overcurrent protection in supply side service connection per 230.94, Exception No. 4.

Ground-fault protection exemption per 230.95 Exception 2 and per 240.13.

Sizing of OC protection on load side of Service Disconnect to comply with 230.208.

*Informational note to Panel - not part of this Proposal-

(A separate CCP has been tendered to add exception 1 to 230.208 as follows:

Exception 1. Short circuit trip settings and coordination for Fire Pumps shall comply with NFPA 70, Paragraph 240.101 and NFPA 20, Paragraph 7-4.3.3)

Also, a separate CCP has been tendered to change the title of this paragraph from Power Wiring to Power Circuit.

Substantiation:

To make text more "user friendly".

Panel Meeting Action: Reject

Panel Statement:

The submitter's proposal merely restates provisions found elsewhere in the code. The article as written prescribes the wiring methods permitted for fire pumps and the references directs the reader to the provisions located elsewhere in the code. This change does not make the text more user friendly.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-92 Log #3423 NEC-P13 **Final Action: Reject**
(695-6)

Submitter: Philip W. Siuda, State of Michigan

Recommendation:

Rearrange 695.6 to make a common subsection for conductors requirements. There is a subsection for conductor sizes.

695.6 Power Wiring. Power circuits and wiring methods shall comply with the requirements in 695.6(A) through (~~G~~) (E), and as permitted in 230.90(A), Exception No. 4; 230.94, Exception No. 4; 230.95, Exception No. 2; 240.13; 230.208; 240.4(A); and 430.31.

A. Conductors.

(~~A~~)(1) Service Conductors. Supply conductors shall be physically routed outside a building(s) and shall be installed as service entrance conductors in accordance with Article 230. Where supply conductors cannot be physically routed outside buildings, they shall be permitted to be routed through buildings where installed in accordance with 230.6(1) or (2). Where a fire pump is wired under the provisions of 695.3(B)(2), this requirement shall apply to all supply conductors on the load side of the service disconnecting means that constitute the normal source of supply to that fire pump.

Exception: Where there are multiple sources of supply with means for automatic connection from one source to the other, the requirement shall only apply to those conductors on the load side of that point of automatic connection between sources.

(~~B~~)(2) Circuit Conductors. Fire pump supply conductors on the load side of the final disconnecting means and overcurrent device(s) permitted by 695.4(B) shall be kept entirely independent of all other wiring. They shall only supply loads that are directly associated with the fire pump system, and they shall be protected to resist potential damage by fire, structural failure, or operational accident. They shall be permitted to be routed through a building(s) using one of the following methods:

(1) Be encased in a minimum 50 mm (2 in.) of concrete

(2) Be within an enclosed construction dedicated to the fire pump circuit(s) and having a minimum of a 1-hour fire resistive rating

(3) Be a listed electrical circuit protective system with a minimum 1-hour fire rating

Exception: The supply conductors located in the electrical equipment room where they originate and in the fire pump room shall not be required to have the minimum 1-hour fire separation or fire resistance rating, unless otherwise required by 700.9(D) of this code.

(~~E~~) (3) Pump Wiring. All wiring from the controllers to the pump motors shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit. Type LFNC-B, or Type MI cable.

(~~C~~)((B) Conductor Size.

(1) Fire Pump Motors and Other Equipment. Conductors supplying a fire pump motor(s), pressure maintenance pumps, and associated fire pump accessory equipment shall have a rating not less than 125 percent of the sum of the fire pump motor(s) and pressure maintenance motor(s) full-load current(s), and 100 percent of the associated fire pump accessory equipment.

(2) Fire Pump Motors Only. Conductors supplying only a fire pump motor(s) shall have a rating not less than 125 percent of the fire pump motor(s) full-load current(s).

(~~D~~)(C) Overload Protection. Power circuits shall not have automatic protection against overloads. Except as provided in 695.5(C)(2), branch-circuit and feeder conductors shall be protected against short circuit only. Where a tap is made to supply a fire pump, and the tap wiring is run in accordance with 230.6, the applicable distance and size restrictions in 240.21 shall not apply.

Exception No. 1: Conductors between storage batteries and the engine shall not require overcurrent protection or disconnecting means.

Exception No. 2: For on-site standby generator(s) that produce continuous currents in excess of 225 percent of the full-load amperes of the fire pump motor, the conductors between the on-site generator(s) and the combination fire pump transfer switch controller or separately mounted transfer switch shall be installed in accordance with 695.6(B) or protected in accordance with 430.52.

The protection provided shall be in accordance with the short-circuit current rating of the combination fire pump transfer switch controller or separately mounted transfer switch.

(~~F~~) (D) Junction Points. Where wire connectors are used in the fire pump circuit, the connectors shall be listed. A fire pump controller or fire pump power transfer switch, where provided, shall not be used as a junction box to supply other equipment, including a pressure maintenance (jockey) pump(s). A fire pump controller and fire pump power transfer switch, where provided, shall not serve any load other than the fire pump for which it is intended.

(~~G~~)(E) Mechanical Protection. All wiring from engine controllers and batteries shall be protected against physical damage and shall be installed in accordance with the controller and engine manufacturer's instructions.

Substantiation:

Proposed change would make Section 695.6 easier to read and understand.

Panel Meeting Action: Reject

Panel Statement:

The submitter's proposal does not improve the format of this section and does not appear to improve how the article reads or the understanding of the requirements. The submitter is only requesting a reformatting of the article with no change in code requirements. This is an unnecessary code revision. The substantiation does not support the proposal.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-93 Log #1787 NEC-P13 **Final Action: Reject**
(695-6(B))

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise text to read as follows:
(B) Circuit Conductors.
Fire pump. Fire pump supply conductors on the load side of the final disconnecting means and overcurrent device(s) permitted by 695.4(B) shall be kept entirely independent of all other wiring. They shall only supply loads that are directly associated with the fire pump system, and they shall be protected to resist potential damage by fire, structural failure, or operational accident. They shall be permitted to be routed through a building(s) using one of the following methods:
(1) Be encased in a minimum 50 mm (2 in.) of concrete
~~(2) Be within an enclosed construction dedicated to the fire pump circuit(s) and having a minimum of a 1-hour fire resistive rating~~
~~(3)~~ (2) Be a listed electrical circuit protective system with a minimum 1-hour fire rating

Substantiation:

Fire pump feeders were originally required to be installed with the same provisions as service entrance conductors outside the building, or in concrete, so as to protect them "from potential damage by fire, structural damage or operational accident". A construction method such as a gypsum enclosure is not adequate for a number of reasons, as follows:
- Gypsum enclosures are not listed by UL, and are "trade sensitive" - variable quality
- Inspection to ensure quality after the fact is not feasible.
- Gypsum enclosures are easily and not uncommonly pierced to make room for other conduits etc., thereby compromising the fire barrier properties.
- Gypsum will not stand up to damage from structural failure, or water.

The requirements for fire pump feeders should be maintained as originally intended, i.e. either encased in concrete, or a listed Electrical Circuit Protective System.

Panel Meeting Action: Reject

Panel Statement:

The provision of allowing fire pump supply conductors to be routed "within an enclosed construction dedicated to the fire pump circuit(s) and having a minimum of a 1 hour fire resistive rating" provides the same protection as the requirement for the room housing the fire pump equipment. The submitter eludes to Gypsum enclosures not being listed by UL and structural damage. This is not an issue for the NEC but an issue for those responsible for determining what qualifies and a 1-hour fire resistive rating. As long as the enclosed fire pump circuits are installed in a dedicated construction with a minimum of a 1-hour fire resistive rating, the panel is satisfied that the conductors are protected to the same degree as the room housing the fire pump equipment.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-94 Log #1788 NEC-P13 **Final Action: Reject**
(695-6(B))

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise text to read as follows:
(B) Circuit Conductors
Fire pump. Fire pump supply conductors on the load side of the final disconnecting means and overcurrent device(s) permitted by 695.4(B) shall be kept entirely independent of all other wiring. They shall only supply loads that are directly associated with the fire pump system, and they shall be protected to resist potential damage by fire, structural failure, or operational accident. They shall be permitted to be routed through a building(s) using one of the following methods:
(1) Be encased in a minimum 50 mm (2 in.) of concrete
(2) Be protected by a fire-rated assembly listed to achieve ~~within an enclosed construction dedicated to the fire pump circuit(s) and having~~ a minimum of a 1-hour fire resistive rating
(3) Be a listed electrical circuit protective system with a minimum 1-hour fire rating

Substantiation:

Fire pump feeders were originally required to be installed with the same provisions as service entrance conductors outside the building, or in concrete, so as to protect them "from potential damage by fire, structural damage or operational accident". A construction method such as a gypsum enclosure is not adequate for a number of reasons, as follows:
- Gypsum enclosures are not listed by UL, and are "trade sensitive" - variable quality
- Inspection to ensure quality after the fact is not feasible.
- Gypsum enclosures are easily and not uncommonly pierced to make room for other conduits etc., thereby compromising the fire barrier properties.
- Gypsum will not stand up to damage from structural failure, or water.

This proposal would allow only listed fire-rated assemblies.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-93.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-95 Log #1789 NEC-P13 (695-6(B)) **Final Action: Reject**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise 695.6(B):
Add the following text to 695.6(B) after the existing Exception:
Conductors installed in a vertical raceway, or in a vertical multiconductor cable, as permitted in (3) above, shall be supported at a spacing not greater than 25 percent of the spacing for conductor supports specified in Table 300.19(A). Raceways and cables shall be terminated in a Type 4 enclosure, as defined in Table 430.91, located not less than 1.5 m (5 ft) from the fire pump controller. Raceways and cables between the Type 4 enclosure and the fire pump controller shall be sealed inside the Type 4 enclosure to prevent migration of combustible gases or vapors into the fire pump controller.
Exception: Wiring methods that do not emit combustible gases or vapors during emergency conditions, or MI cable, shall be permitted to be supported in accordance with Table 300.19(A) and the additional Type 4 enclosure shall not be required.

Substantiation:

This was proposed as a Tentative Interium Amendment in 2002.
The original justification, unaltered, is appended. In addition, a short document outlining responses to the issues raised in the course of the Tentative Interium Amendment has been provided.
Note: Supporting material is available for review at NFPA headquarters.

Panel Meeting Action: Reject

Panel Statement:

Sections 110.3(A) and 110.3(B) require installation of the wiring in accordance with listing, labeling, and manufacturer's instructions.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-96 Log #3472 NEC-P13 (695-6(B)) **Final Action: Reject**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Add text to read as follows:
Fire pump supply conductors (a) from the generator, and (b) on the load side of the final disconnecting means and overcurrent device(s) permitted by 695.4(B) shall be kept entirely independent of all other wiring.

Substantiation:

The code at present only addresses fire protection of the normal supply conductors. The supply conductors from the generator should also be protected from fire. By including these words, the fire rating requirements in the subsequent sentences will apply to both normal and emergency conductors.

Panel Meeting Action: Reject

Panel Statement:

By adding "from the generator" to this article this proposal would eliminate the ability of the generator if sized correctly to supply other non-fire pump loads as permitted in 695.3(B)(1). The intent of this article as written is to insure that the normal source for the fire pump supply that is connected ahead of the final disconnecting means supplies only fire pump loads and is not run with other conductors such as the generator supply. 695.3(B)(3) which reads, "Arrangement. The power sources shall be arranged so that a fire at one source will not cause an interruption at the other source. [NFPA 20, 6.2.3, 6.2.4.1, 6.2.4.3, 6.6.1]", provides the provision that keeps the normal source supply away from the generator or other multiple supplies and provides adequate protection.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-97 Log #2921 NEC-P13 **Final Action: Reject**
(695-6(B)(3))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add the following text to 695.6(B)(3) after the existing text:
"Wiring systems which can pass combustible gases or vapors generated by the cable material when exposed to heat shall be designed to isolate these flammable gases and vapors from sources of ignition. Conductors installed in a vertical raceway shall be supported at intervals sufficient to protect cable as affected by the fire."

Substantiation:

Listed fire rated cables with ceramifiable insulation have been identified as a potential source of flammable gas during the decomposition of the insulation during a fire. In addition, the strength of long vertical sections of the cable when weakened by exposure to the fire and insulation decomposition components has been questioned. The proposed NEC changes highlights both risks and notes the need for an engineered solution without over prescribing the solution.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-95.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Comment on Affirmative:

ELKINS: A requirement that these "wiring systems which can pass combustible gases or vapors generated by the cable material when exposed to heat be designed to isolate these flammable gases and vapors from sources of ignition and conductors installed in a vertical raceway be supported at intervals sufficient to protect cable as affected by the fire" provides more flexibility for the designer than the other proposals addressing this issue.

13-98 Log #3293 NEC-P13 **Final Action: Reject**
(695-6(B)(3))

Submitter: James Conrad, Rockbestors-Surprenant Cable Corp.

Recommendation:

Add the following new sentence to the end of 695.6(B)(3):
Be a listed electrical circuit protective system with a minimum 1-hour fire rating. Systems, where under fire condition, that produce smoke through the raceway or cable, shall be isolated from all arcing and sparking parts. One method of isolation is to use a Type 1 enclosure adjacent to the Fire Pump Controller and sealing the connecting raceway between the enclosure and controller.

Substantiation:

Some of the new fire rated systems (Type MC and Type RHH tested to UL 2196), when under fire conditions, produce a gas or vapor material which travels through the cable or raceway systems. This gas or vapor material can be ignited under certain conditions and should be isolated from the arcing or sparking contacts of electrical equipment such as the fire pump controller. It is recommended by the manufacture of the MC cable system that a Type 1 enclosure be used to isolate this gas or vapor material. The enclosure is placed adjacent to the controller with the connecting raceway scaled with a pliable compound. This method of isolation has been used since the introduction of the MC cable system and complies with the applicable sections of the NEC.

Panel Meeting Action: Reject

Panel Statement:

The listed protective system would be required to be installed per the listing requirements which would take into consideration all the requirements necessary for a complete listed system. The submitter through various tests proposes more stringent installation restraints in vertical raceways than what is found in Article 300.19. The submitter's vertical strength test does not provide sufficient documentation that the provisions of Article 300.19 do not provide the necessary support capabilities. In addition, the panel would expect that a listed electrical circuit protective system with a minimum 1-hour rating would consider breaking strength during fire conditions. See also panel action and statement on Proposal 13-95.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Comment on Affirmative:

FLACH: Part of the panel statement belongs in Proposal 13-95.

13-99 Log #3232 NEC-P13 **Final Action: Reject**
(695-6(C)(1))

Submitter: James Conrad, Rockbestors-Surprenant Cable Corp.

Recommendation:

Add the following new sentence to the end of 695.6(C)(1) Fire Pump Motors and Other Equipment. Conductors supplying a fire pump motor(s), pressure maintenance pumps, and associated fire pump accessory equipment shall have a rating not less than 125 percent of the sum of the fire pump motor(s) and pressure maintenance motor(s) full-load current(s), and 100 percent of the associated fire pump accessory equipment. Circuit conductors as permitted by 695.6(B) shall be sized from the 75C column for the allowable ampacities permitted in Table 310.16.

Substantiation:

One method of complying with 695.6(B)(3) is the use of fire resistive cables such as Type MI and Type MC both having a 2-hour fire resistive rating. Both of these cables are available in a single conductor configuration and in the 2002 NEC can be sized from Table 310.17 and Table 310.20 respectively. For example, a 100 hp, 480 volt 3-phase pump motor sized per 695.6(C)(1) would require a cable capable of carrying 155 amps. (The commentary text in the 2002 handbook suggests using Table 310.16, a 2/0 copper conductor sized under the 75 C column). Under the new rules, cables sized from Table 310.17, you could use a 3 AWG MI cable. That means a #3 AWG would also be connected to the 800 amp disconnect/overcurrent device, as required per 695.4(B)(1), and according to the provisions in 250.122 a copper 1/0 AWG conductor is required. This would be very dangerous in an emergency situation.

Panel Meeting Action: Reject

Panel Statement:

There are many types of cables and methods of sizing the cables that are adequate. Limiting the cable selection to just 310.16, 75 degree C column is too restrictive and unnecessary.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-100 Log #601 NEC-P13 **Final Action: Accept**
(695-6(C)(2))

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

Recommendation:

Replace 695.6(C)(2) with the following:
(2) Fire Pump Motors Only. ~~Conductors supplying only a fire pump motor(s) shall have a rating not less than 125 percent of the fire pump motor(s) full-load current(s).~~ Conductors supplying only a fire pump motor shall have a minimum rating in accordance with 430.22. Larger conductors may be necessary to satisfy the requirement in 695.7.

Substantiation:

Current 695.6(C)(2) offers no guidance for selection of conductors for reduced-voltage start motors. Reference to 430.22 provides requirements for sizing conductors for both across-the-line and reduced voltage start motors. Reference also reemphasizes that sizing is based on motor full-load current and not overcurrent protective device settings.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-101 Log #2400 NEC-P13 **Final Action: Accept in Principle**
(695-6(C)(3))

Submitter: David A. Williams Lansing, MI

Recommendation:

Wye-Start Delta-Run Motor. For a wye-start, delta-run connected motor, the selection of the branch-circuit conductors on the line side of the controller shall be based on the motor full-load current. The selection of conductors between the controller and the motor shall be based on 58 percent of the motor full-load current.

Substantiation:

Article 695 has not addressed the wye-start delta-run motor applications and section 430.22(C) would not apply.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action on Proposal 13-100.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-102 Log #1618 NEC-P13 **Final Action: Accept in Part**
(695-6(D))

Submitter: R. Schneider Lancaster, SC

Recommendation:

Reword entirely.
695.6(D) Overload Protection. Power circuits shall not have automatic protection against overloads. Except for protection of transformer primaries provided in 696.5(C)(2), branch-circuit and feeder conductors shall be protected against short circuit only. Where a tap is made to supply a fire pump, the wiring shall be treated as service conductors in accordance with 230.6. The applicable distance and size restrictions in 240.21 shall not apply.
Exception No. 1: Conductors between storage batteries and the engine shall not require overcurrent protection nor disconnecting means.
Exception No. 2: For on-site standby generator(s) rated to produce continuous current in excess of 225 percent of the full-load amperes of the fire pump motor, the conductors between the on-site generator(s) and the combination fire pump transfer switch controller or separately mounted transfer switch shall be protected in accordance with 430.52 or installed as a Supervised Connection in accordance with 696.6(B).
The short circuit protection shall be coordinated as required in 240.12.

Substantiation:

To make it user friendly and understandable and compatible with Figure A-7-8 (Arrangement A) NFPA 20 (1999).

Panel Meeting Action: Accept in Part

Correct reference from 696.6(B) in the first sentence of Exception No. 2, to be corrected to be 695.6(B).

Panel Statement:

The Panel accepts the entire proposal with the exception of the incorrect reference 696.6(B) in the first sentence of Exception No. 2, which should be corrected to be 695.6(B). The panel agrees that the submitter's proposal is more user friendly. However, the panel did not accept this change to make the Article compatible with Figure A-7-8 (Arrangement A) NFPA 20. The panel does not arrange articles to fit the format of Annex material of other documents.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-103 Log #1819 NEC-P13 **Final Action: Reject**
(695-6(D) Exception No. 2)

Submitter: James S. Nasby, Master Control Systems, Inc.

Recommendation:

Move the Exception to 695.6(B) Circuit Conductors.
Also add requirement for branch circuit protection (Article 210).

Substantiation:

The exception is to give relief from the requirement for being encased in 2 in. of concrete (or equivalent) which is covered in (B).
Also, the exception makes reference to 430.52 which covers motor branch circuits. The fire pump emergency circuit is not a motor branch circuit since there is no motor overload device in this circuit. The conductors need to be protected from overload (overheating) by protection upstream of the conductors (regular branch circuits) since there is no down stream protection as with other motor branch circuits.

Panel Meeting Action: Reject

Panel Statement:

This exemption is located under the correct article, overcurrent protection. It is an exemption from overcurrent protection as long as the conductors are installed according to 695.6(B) or as an alternate method overcurrent protection based on 430.52. Section 430.52 Rating or Setting for Individual Motor Circuit is more appropriate for overcurrent protection of fire pump motors than article 210 Branch Circuits. Article 210 relating to motor protection refers to Article 430.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-104 Log #2501 NEC-P13 **Final Action: Accept in Part**
(695-6(E))

Submitter: George W. Flach, Nat'l Armored Cable Mfrs' Assn. (NACMA)

Recommendation:

Add Jacketed Type MC cable so that this part will read:
(E) Pump Wiring. All wiring from the controllers to the pump motors shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit Type LFNC-B, Listed Type MC cable with an impervious nonmetallic covering, or Type MI cable.

Substantiation:

Jacketed Type MC cable provides adequate protection for the contained conductors.

Panel Meeting Action: Accept in Part

Add Jacketed Type MC cable so that this part will read:
(E) Pump Wiring. All wiring from the controllers to the pump motors shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit Type LFNC-B, Listed Type MC cable with an impervious covering, or Type MI cable.

Panel Statement:

The word nonmetallic was deleted to permit metallic as well as nonmetallic. Evidence exists that shows the recommended additional wiring method to be equivalent to those already approved in this section.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Abstain: 1

Explanation of Abstention:

FLACH: I cannot vote on this proposal because of my classification on the panel, and because I sometimes act as a consultant for some manufacturers of Type MC cable.

13-105 Log #602 NEC-P13 **Final Action: Accept**
(695-6(H) (New))

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

Recommendation:

Add new 695.6(H) - titled "Ground Fault Protection of Equipment".
695.6(H) Ground Fault Protection of Equipment. Ground fault protection of equipment shall not be permitted for fire pumps.

Substantiation:

The text in 215.10 Exception No. 2, 230.95 Exception No. 2, and 240.13 which states that the requirements of these sections shall not apply to fire pumps is not sufficient to mandate that ground fault protection of equipment for fire pumps shall not be permitted.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-106 Log #650 NEC-P13 **Final Action: Accept**
(695-12(C))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise:
Storage batteries for ~~diesel~~ engine-generator drives shall be supported...(remainder unchanged).

Substantiation:

Though the preponderance of engine-generator sets may be disel-fueled, gas and gasoline-powered sets, where permitted or used, should be included.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-107 Log #2507 NEC-P13 **Final Action: Accept in Part**
(695-14(E))

Submitter: George W. Flach, Nat'l Armored Cable Mfrs' Assn. (NACMA)

Recommendation:

Add Jacketed Type MC cable so that this part will read:
(E) Electric Fire Pump Control Wiring Methods. All electric motor-driven fire pump control wiring shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit Type B (LFNC-B), Listed Type MC cable with an impervious nonmetallic covering, or Type MI cable.

Substantiation:

Jacketed Type MC cable provides adequate protection for the contained conductors.

Panel Meeting Action: Accept in Part

Change the term impervious nonmetallic covering in the recommendation to impervious covering**.**

Panel Statement:

See panel statement on Proposal 13-104.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Abstain: 1

Explanation of Abstention:

FLACH: See my Explanation of Abstention on Proposal 13-104.

13-108 Log #1023 NEC-P13 **Final Action: Reject**
(700-3)

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Add, "Generator sets shall be listed for use on emergency systems.

Substantiation:

UL Standard 2200 has been published for listing emergency generator sets for stationary installations. Multiple manufacturers have listed generator set equipment available. Listing of generator sets can provide a consistent basis for approval of equipment by the authority having jurisdiction based on a published standard for safety. Listing relieves the authority having jurisdiction of the burden of examination of equipment for which the AHJ lacks resources or facilities.

Panel Meeting Action: Reject

Panel Statement:

Article 700.3 that states "All equipment shall be approved for use on emergency systems" now allows listed generator sets. Adding this requirement will take out of the hands of the authority having jurisdiction the use of other acceptable non-listed generators.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-109 Log #1019 NEC-P13 **Final Action: Accept**
(700-5(B))

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Revise text to read as follows:
The alternate power source shall be permitted to supply emergency, legally required standby, and optional standby loads where the source has adequate capacity or where automatic selective load pickup and load shedding is provided as needed to ensure adequate power to (1) the emergency circuits, (2) the legally required standby circuits, and (3) the optional standby circuits in that order of priority.

Substantiation:

Proposal would add "where the source has adequate capacity or" so that load shed and add is not required if the source has the capacity to supply all the connected loads.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-110 Log #1022 NEC-P13 **Final Action: Accept**
(700-6(A))

TCC Action:

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

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Revise text to read as follows:
Transfer equipment, including automatic transfer switches, shall be automatic, listed for emergency use, and approved by the authority having jurisdiction.

Substantiation:

By substituting the term "listed" for the presently used "identified" which are both defined terms, this proposal intends to require that this equipment be subject to periodic follow-up inspection of production equipment to ensure suitability for emergency purposes.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 11 Negative: 3

Explanation of Negative:

ELKINS: The submitter did not provide substantiation that requiring the increased cost of "listed" transfer equipment was justified nor made substantive improvement to reliability. No examples, failures or misapplication risks were cited in the substantiation.

GLENN: The panel should have rejected this proposal for the following reasons:

1. The article as now written is adequate and safe. The submitter did not supply any substantiation or incidents that demonstrate the need for such a restrictive revision.
2. The article as written, "Transfer equipment, including automatic transfer switches, shall be automatic, identified for emergency use, and approved by the authority having jurisdiction...," requires that the transfer equipment be identified. Identified is defined as, "Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular Code requirement. FPN: Some examples of ways to determine suitability of equipment for a specific purpose, environment, or application include investigations by a qualified testing laboratory (listing and labeling), an inspection agency, or other organizations concerned with product evaluation.", now allows for listed transfer equipment and allows for other acceptable solutions. Changing from identified to listed eliminates and prohibits other types of transfer systems and equipment that are safe, necessary, and acceptable.
3. There are many transfer designs being used for the above 600 volts emergency systems that use schemes such as listed switch gear and starters to provide the transfer from normal to emergency power that are not listed for emergency use but are necessary, reliable, and acceptable. This change would eliminate and prohibit these types of systems and eliminate the authority having jurisdiction from accepting other suitable equipment and systems.
4. The submitter's substantiation stated that "this proposal intends to require that this equipment be subject to periodic follow-up inspection of production equipment to ensure suitability for emergency purposes." The submitter did not provide any substantiation that production equipment now being used does not have follow-up inspections. If the submitter is referring to follow-up inspections in the field after installation of the equipment, then I must point out that listing does not provide the means for follow up inspections.

HORNBERGER: This proposal should be rejected. The submitter did not offer any technical substantiation to support the requirement for listing. The requirement for listing is not necessary if the equipment is identified and approved by the authority having jurisdiction. Also, the requirement for listing would obviate the need for approval by the authority having jurisdiction.

13-111 Log #2848 NEC-P13 **Final Action: Reject**
(700-6(A), 701.7(A), 702.6)

Submitter: Frank Farina Bethel Park, PA

Recommendation:

Add new text to read as follows:
There are operational conditions where it may be desirable to transfer loads with zero interruption of power when conditions permit. For these conditions, closed transition transfer switches which cause the interconnection of the normal and emergency source of supply for a brief period can be provided.

Substantiation:

In critical applications, such as life safety, computer data processing, communications and other sensitive electronic loads, even the slightest momentary loss of power can affect operation. The closed transition transfer switch eliminates this problem by overlapping both sources for a brief period (less than 100 mS).

Panel Meeting Action: Reject

Panel Statement:

The panel agrees with the present code language that permits closed transition transfer switches.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-112 Log #2402 NEC-P13 **Final Action: Reject**
(700-6(D))

Submitter: David Oswald, State of Michigan

Recommendation:

Transfer equipment shall supply only emergency loads. Legally required standby loads (Article 701)or optional standby loads (Article 702)are not permitted to be supplied from the emergency system transfer switch.

Substantiation:

In the plan reviews done at the State of Michigan we are not allowed to reference the Handbook or use commentary from the Handbook in our plan reviews since it is not enforceable. No where in the code book can I derive the intent other than in the commentary of the Handbook. The commentary as it appears in the 1999 NEC appears clear and mandatory.If commentary is unenforceable and unable to be referenced then I believe it should be included in the actual code.

Panel Meeting Action: Reject

Panel Statement:

This article now states that "Transfer equipment shall supply only emergency loads" is quite specific. It does not say emergency loads, legally required standby loads, etc. There is no reason to add a list of other loads that are not allowed. Article 700 covers emergency systems. If legally required standby systems or optional standby loads were considered emergency systems, then they would be included in this Article.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-113 Log #2278 NEC-P13 **Final Action: Reject**
(700-8(B))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
700.8 Signs.
(A) Emergency Sources. A sign shall be placed at the service entrance equipment indicating type and location of on-site emergency power sources.
Exception: A sign shall not be required for individual unit equipment as specified in 700.12(e).
(B) Grounding. Where the ~~grounded~~ earth circuit conductor connected to the emergency source is connected to a grounding electrode conductor at a location remote from the emergency source, there shall be a sign at the grounding location that shall identify all emergency and normal sources connected at that location.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-114 Log #3319 NEC-P13 **Final Action: Reject**
(700-9)

Submitter: James Conrad, Rockbestors-Surprenant Cable Corp.

Recommendation:

Add a new 700.9(E) to read:
(E) Feeder Conductors. Conductors supplying loads to meet the requirements of 700.9(D)(1) shall be sized from the 75C column for the allowable ampacities permitted in Table 310.16.

Substantiation:

The intent of 700.9 is to assure the wiring of the emergency system will function in severe conditions such as a fire. One method of complying with 700.9(D)(1) is the use of fire resistive cables such as Type MI and Type MC both having a 2-hour fire resistive rating. Both of these cables are available in a single conductor configuration and in the 2002 NEC can be sized from Table 310.17 and Table 310.20 respectively. Although these cables are accepted at higher ampacity in other areas of the NEC. They should not be allowed at these elevated ampacities as a fire rated feeder for the following reasons. 1) If this was a nonemergency feeder it would be sized from Table 310.16 (cable in conduit) why would you want less copper in a fire rated feeder? 2) The copper armor is used as the equipment grounding conductor which has never been third party tested to these high ambient and high current conditions.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 13-99.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-115 Log #221 NEC-P13 **Final Action: Reject**
(700-9(B))

Submitter: Stephen John Chernetski, Raasch Associates, Inc.

Recommendation:

Add new text to read as follows:
...unless otherwise permitted in (1) through (~~4~~ 5):
(5) Wiring within a main lug only panelboard located at the generator. The panelboard shall have only two overcurrent protective devices. One of these overcurrent protective devices shall protect the emergency wiring and the other shall protect the non-emergency wiring as allowed by 700.5(B).

Substantiation:

700.5(B) allows an emergency generator to feed both emergency and non-emergency loads. In order to ensure that an overcurrent in the non-emergency wiring does not cause an overcurrent device to operate that would de-energize an emergency circuit, two or more overcurrent protective devices are required at the generator. The most convenient way of providing the protection required by 240.4 and 240.21 is with a panelboard.

Panel Meeting Action: Reject

Panel Statement:

Currently the code requires separation between the emergency and the non emergency overcurrent protective devices. The panel does not see the value of lessening this requirement.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-116 Log #1791 NEC-P13 (700-9(D)) **Final Action: Accept**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise 700.9(D)
Delete and insert text in 700.9(D)(1)
700.9(D) Fire Protection
(1) Feeder-Circuit Wiring
(1) Be installed ~~with buildings~~ in spaces or areas that are fully protected by an approved automatic fire suppression system.

Substantiation:

The intent and pre-1999 wording of the code was to have wiring and equipment fire protected by being in a fully sprinkled space, or by being in spaces with a 1-hour fire rating, or (in the case of wiring) by being a listed electrical circuit protective system with a 1-hour fire rating.

The wording was changed in the 1999 code to allow feeders unprotected provided they are in fully sprinkled buildings. The effect of this is that an emergency feeder circuit can be run in the space above a sprinkled area. A fire in that area is not sprinkler protected, and therefore the emergency feeder is susceptible.

The pre-1999 wording was altered for wiring only; the requirement for equipment is unchanged, correctly in my opinion:

e.g. paragraph 700.9(D)(2), and similarly in 700.12, as follows:

"700.9(D)(2) Feeder Circuit Equipment. Equipment for feeder circuits...shall be located in spaces fully protected by approved automatic fire suppression systems...or in spaces with a 1-hour fire resistance rating".

"700.12 General Requirements. Equipment for sources of power as descried in 700.12(A) through (D)...shall be installed either in spaces fully protected by approved automatic fire suppression systems...or in spaces with a 1-hour fire rating".

It is our contention that the same rules should apply to wiring as to the equipment the wiring serves.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-117 Log #1790 NEC-P13 (700-9(D)(1)) **Final Action: Reject**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise 700.9(D)(1):
Add the following text to 700.9(D)(1) following 700.9(D)(1)(6):

Conductors installed in a vertical raceway, or in a vertical multiconductor cable, as permitted in (2) and (6) above, shall be supported at a spacing not greater than 25 percent of the spacing for conductor supports specified in Table 300.19(A). Raceways and cables shall be terminated in a Type 4 enclosure, as defined in Table 430.91, located not less than 1.5 m (5 ft) from the equipment enclosure. Raceways and cables between the Type 4 enclosure and the equipment enclosure shall be sealed inside the Type 4 enclosure to prevent migration of combustible gases or vapors into the equipment enclosure.

Exception: Wiring methods that do not emit combustible gases or vapors during emergency conditions, or MI cable, shall be permitted to be supported in accordance with Table 300.19(A) and the additional Type 4 enclosure shall not be required.

Substantiation:

This was proposed as a Tentative Interium Amendment in 2002.

The original justification, unaltered, is appended. In addition, a short document outlining responses to the issues raised in the course of the Tentative Interium Amendment has been provided.

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

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-95.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-118 Log #3236 NEC-P13 **Final Action: Accept**
(700-9(D)(1))

Submitter: Edward Walton, Draka USA

Recommendation:

Revise Feeder-Circuit Wiring to Emergency circuit Wiring. Emergency-circuit wiring shall meet one of the following conditions.

Substantiation:

Critical fire protection systems require operational integrity throughout the duration of a fire. Because of this, numerous codes and standards, including various model building codes and other NFPA documents require that all portions of the power wiring fed from the Article 700 complying system have a suitable level of circuit integrity and survivability. It is of utmost importance that NFPA 70, National Electrical Code, offer a code-complying method of meeting these requirements.

The current wording limits the circuit integrity and survivability feature to feeder circuits. It is crucial that the NEC make provision for circuit integrity and survivability to apply to all portions of the power wiring in order to provide supportive correlation with the other codes and standards that require this.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-119 Log #3294 NEC-P13 **Final Action: Reject**
(700-9(D)(1))

Submitter: James Conrad, Rockbestors-Surprenant Cable Corp.

Recommendation:

Add the following statement to the end of 700.9(D)(1):

Systems, where under fire condition that produce smoke through the raceway or cable, shall be isolated from all arcing and sparking parts. One method of isolation is to use a Type 1 enclosure adjacent to the transfer switch and sealing the connecting raceway between the enclosure and switch.

Substantiation:

Some of the new fire rated systems (Type MC and Type RHH tested to UL 2196), when under fire conditions, produce a gas or vapor material which travels through the cable or raceway systems. This gas or vapor material can be ignited under certain conditions and should be isolated from the arcing or sparking contacts of electrical equipment such as the transfer switch. It is recommended by the manufacture of the MC cable system that a Type 1 enclosure be used to isolate this gas or vapor material. The enclosure is placed adjacent to the transfer switch and the connecting raceway sealed with a pliable compound. This method of isolation has been used since the introduction of the MC cable system and complies with the applicable sections of the NEC.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-98.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-120 Log #329 NEC-P13 **Final Action: Reject**
(700-9(D)(1)(1))

Submitter: James M. Daly, General Cable

Recommendation:

Revise text as follows: "Be installed within ~~with~~ buildings...".

Substantiation:

Editorial.

Panel Meeting Action: Reject

Panel Statement:

See panel action on Proposal 13-116.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-121 Log #2922 NEC-P13 **Final Action: Reject**
(700-9(D)(1)(6))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add the following text to 700.9(D)(1)(6) after the existing text:
"Wiring systems which can pass combustible gases or vapors generated by the cable material when exposed to heat shall be designed to isolate these flammable gases and vapors from sources of ignition. Conductors installed in a vertical raceway shall be supported at intervals sufficient to protect cable as affected by the fire."

Substantiation:

Fire rated cables with ceramifiable insulation have been identified as a potential source of flammable gas during the decomposition of the insulation during a fire. In addition, the strength of long vertical sections of the cable when weakened by exposure to the fire and insulation decomposition components has been questioned. The proposed NEC changes highlights both risks and notes the need for an engineered solution without over prescribing the solution.

Panel Meeting Action: Reject

Panel Statement:

See panel action on Proposal 13-95 and 13-98.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

Comment on Affirmative:

ELKINS: A requirement that these "wiring systems which can pass combustible gases or vapors generated by the cable material when exposed to heat be designed to isolate these flammable gases and vapors from sources of ignition and conductors installed in a vertical raceway be supported at intervals sufficient to protect cable as affected by the fire" provides more flexibility for the designer than the other proposals addressing this issue.

Sequence Number 13-122 is not used.

13-123 Log #1017 NEC-P13 **Final Action: Reject**
(700-12(B)(6))

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Revise text to read as follows:
Where an outdoor housed generator set located within sight of the building or structure is equipped with a readily accesible disconnecting means, an additional disconnecting means shall not be required where ungrounded conductors pass through the building or structure.

Substantiation:

The generator set disconnecting means is within the generator outdoor enclosure, typically mounted on the alternator frame.

Panel Meeting Action: Reject

Panel Statement:

The disconnect is the subject of the requirement for visibility not the generator.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: Generators are commonly supplied with accessory compartments containing the generator breaker. None of these disconnects are visible unless the accessory cover or door is opened. Exposing the breaker to the elements to make it always visible would lower the reliability of the installation in most environments. Even for a generator located three ft from a building, the disconnect would not be visible unless the door or cover on the accessory compartment faced the breaker and faced the building. The purpose of the "in sight of" provision is satisfied if the disconnect on a generator in sight of a building (50 ft or less by definition) can be readily reached to confirm its position.

13-124 Log #1283 NEC-P13 **Final Action: Accept in Principle**
(700-12(B)(6))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:

(B) Generator Set.

(6) Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors enter or pass through the building or structure.

Substantiation:

The new text would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit entering or passing through a separate building or structure as required by 225.31.

Panel Meeting Action: Accept in Principle

Change "…enter …" to "…serve …".

Panel Statement:

Change is made to proposal to make the wording consistent with text in 225.32.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-125 Log #2806 NEC-P13 **Final Action: Accept in Principle**
(700-12(B)(6))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: Henry A. Jenkins, Wake County

Recommendation:

Add the phrase "supply or" before the word "pass" in the 5th line down in 700.12(B)(6) to read as follows:
(6) Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors (supply or pass) through the building or structure.

Substantiation:

The new text would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit supplying or passing through a separate building or structure in accordance with 225.31 as intended by the panel for 2002.

Panel Meeting Action: Accept in Principle

Change "…supply…" to "… serve…".

Panel Statement:

See panel action on Proposal 13-124.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-126 Log #3098 NEC-P13 **Final Action: Accept in Principle**
(700-12(B)(6))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: James W. Carpenter, International Association of Electrical Inspectors

Recommendation:

Add the phrase "supply or" before the word "pass" in the 5th line down in 700.12(B)(6) to read as follows:
"700.12(B) Generator Set.
(6) Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors supply or pass through the building or structure."

Substantiation:

The new text would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit supplying or passing through a separate building or structure in accordance with 225.31 as intended by the Panel for 2002.

Panel Meeting Action: Accept in Principle

Change "…supply…" to "…serve…".

Panel Statement:

See panel action on Proposal 13-124.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-127 Log #665 NEC-P13 **Final Action: Accept**
(700-12(D))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise text to read as follows:
Where acceptable to the authority having jurisdiction as suitable for use as an emergency source of power ~~a second~~ an additional service shall be permitted. This service shall be in accordance with the applicable provisions of Article 230, with the following additional requirements:
1. Separate service drop or service lateral.
2. Service conductors sufficiently remote electrically and physically from ~~the normal~~ any other service conductors to minimize the possibility of simultaneous interruption of supply.

Substantiation:

A permitted separate service may not be a second service. Service-entrance conductors, which may be Type SE cable or open wiring on insulators should also require separation, not only from the "normal" service, but any other services such as for fire pumps, where an occurrence can also cause disruption of power in another system.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-128 Log #171 NEC-P13 **Final Action: Accept in Principle in Part**
(700-12(E) (New))

TCC Action:

The Technical Correlating Committee directs that the Action on this Proposal be rewritten to comply with the NEC Style Manual to read as follows: "Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692." and change "may" to "shall" in the last sentence.

Submitter: Frank Seiler, Access Wiring

Recommendation:

Add new text to read as follows:
700.12(E) Fuel Cell System. Fuel cell systems used as a source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.
Installation of a fuel cell system shall meet the requirements of Article 691.
Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it may not serve as the sole source of power for the emergency standby system.

Substantiation:

It seems clear that the present pace of research, development, and testing of fuel cell technology will have matured to the point where such systems may be in general use by the 2005 through 2007 code cycle. Reliability is matched to already existing sources of power for emergency standby systems. For reference, I have provided an article from the January issue of Electrical Contractor Magazine, Fuel Cells Now: An Update. It, along with the material referenced in the article supports the need of this code provision.
The above proposal would be a logical insertion, moving the existing 700.12(E) to become 700.12(F).
Code language mirrors that of the rest of the article. The 2 hour requirement mirrors that of 700.12(B)(2). It seems logical to have the same time requirement of this fuel source.
Note: Supporting Material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle in Part

(1) Renumber existing 700.12(E) Unit Equipment as follows:
700.12(F) Unit Equipment.
(2) Add submitter's new article 700.12(E) Fuel Cell System.
(3) Correct the submitter's incorrect reference from Article 691 to Article 692.

Panel Statement:

The panel's action meets the intent of the submitter. Article 692 is the correct reference to Fuel Cells. The entire article is accepted except the incorrect reference.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-129 Log #1462 NEC-P13 **Final Action: Reject**
(700-16)

Submitter: Jamie McNamara Hastings, MN

Recommendation:

I underlined added text
700.16 Emergency Illumination
Emergency illumination shall include all required means of egress lighting, illuminated exit signs, and all other lights specified as necessary to provide required illumination.
Emergency lighting systems shall be designed and installed so that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave in total darkness any space that requires emergency illumination.
Where high-intensity discharge lighting such as high- and low-pressure sodium, mercury vapor, and metal halide is used as the sole source of normal illumination, the emergency lighting system shall be required to operate until normal illumination has been restored.
Exception: Alternative means that ensure emergency lighting illumination level is maintained shall be permitted.
FPN: It is the intent of this article that illumination to an area, not be provided entirely by a single circuit from an emergency system.

Substantiation:

To help clarify the intent of 700.16.

Panel Meeting Action: Reject

Panel Statement:

The submitter did not supply any substantiation that his FPN truly clarifies the intent of 700.16. Just as in the case of a primary service being backed up by a single reliable emergency service as defined in 700.12. A single reliable emergency supply would meet the intent of this section. Fine Print Notes can not contain requirements.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-130 Log #1471 NEC-P13 (700-16) **Final Action: Reject**

Submitter: Jamie McNamara Hastings, MN

Recommendation:

I underlined added text. I put a strike through deleted text.

700.16. Emergency Illumination

Emergency illumination shall include all required means of egress lighting, illuminated exit signs, and all other lights specified as necessary to provide required illumination.

Emergency lighting systems shall be designed and installed so that the failure of any individual ~~lighting~~ element, such as the burning out of a light bulb or the opening of a single branch circuit overcurrent device, cannot leave in total darkness any space that requires emergency illumination.

Where high-intensity discharge lighting such as high- and low-pressure sodium, mercury vapor, and metal halide is used as the sole source of normal illumination, the emergency lighting system shall be required to operate until normal illumination has been restored.

Exception: Alternative means that ensure emergency lighting illumination level is maintained shall be permitted.

Substantiation:

To help clarify and make it clear that a single branch circuit item should not open the circuit and leave an entire area in the dark on accident or purpose.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-129.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-131 Log #2840 NEC-P13 (700-16(B)) **Final Action: Reject**

Submitter: James M. Imlah, City of Hillsboro,OR

Recommendation:

Add new text to read as follows:

700.16(B) Identification. All luminaries that are used for emergency illumination shall be identified as part of the required egress illumination.

Substantiation:

I have noticed over the years that luminaries are not being repaired or not all lamps are being replaced or repaired in luminaries that have found to be part of the emergency egress lighting. Having discussions with the fire marshals and the building officials who inspect buildings for required minimum safety, have found many luminaries in various forms of disrepair or not operating. When one of the fire marshals asks to check the emergency egress lighting, many times fixtures do not operate due to various problems. When checking with the maintenance persons in large facilities, or owners of leased facilities, no one knows which of the fixtures are on the emergency egress lighting. There have been cases when the local jurisdictional electrical inspector is called out for inspection and testing of the egress lighting after repairs have been made. An identification mark (other than fixtures with backup battery LEDs already) shall be applied when the system is installed under new construction, additional fixtures are added to existing system, or the system has been repaired and tested. By identifying the fixture (we use a small red dot on the fixture) repairs can be made in a more timely manner and the luminaries that are part of the egress lighting will be identified. Also, identification of the fixture lets all persons know if the fixture is part of the egress lighting and if it is not working properly, repairs can be made.

Panel Meeting Action: Reject

Panel Statement:

The problem identified by the submitter is a violation of the listing of some products such as unit equipment. The requirement to identify other types of luminaires may not be practical and is a maintenance issue of 700.4. The submitter's substantiation discusses lack of maintenance or the lack of an understanding of the emergency system would be a violation Section 700-4 that provides the requirements for testing, routine testing, routine maintenance, and documentation. Section 700.4 now provides the means to accomplish what the submitter states as a problem.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-132 Log #1433 NEC-P13 **Final Action: Reject**
(700-17)

Submitter: Patrick Weldon Apple Valley, MN

Recommendation:

Revise text to read as follows:
700.17 Circuits for Emergency Lighting. Branch circuits that supply emergency lighting shall be installed to provide service from a source complying with 700.12 when the normal supply for lighting is interrupted. Such installations shall provide either one of the following:
(1) An emergency lighting supply, independent of the general lighting supply, with provisions for automatically transferring the emergency lights upon the event of failure of the general lighting system supply
(2) Two or more separate and complete systems with independent power supply, each system providing sufficient current for emergency lighting purposes
Unless both systems are used for regular lighting purposes and are both kept lighted, means shall be provided for automatically energizing either system upon failure of the other. Either or both systems shall be permitted to be a part of the general lighting system of the protected occupancy if circuits supplying lights for emergency illumination are installed in accordance with other sections of this article. In all cases the failure of any one supply or component of the branch circuit(s) will not leave an area required to be provided with emergency illumination without adequate light levels. Areas served from two separate transfer switches on the emergency system shall not be required to have circuits from the normal source.

Substantiation:

For clarification that areas requiring emergency illumination such as stairwells and paths of egress shall not be supplied by an emergency branch circuit(s) only. The failure of a single device such as a fuse or circuit breaker could leave these areas in total darkness or with inadequate light levels during an emergency.
Areas served from two separate transfer switches from the emergency system will provide a greater reliability.

Panel Meeting Action: Reject

Panel Statement:

The provisions of this article are adequate. Providing emergency lights or lighting when the normal source is interrupted is adequate. The submitter did not supply any substantiation that more stringent requirements are necessary or there is a need for even greater reliability. Two sources of illumination are adaquate.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-133 Log #935 NEC-P13 **Final Action: Accept**
(700-21)

TCC Action:

The Technical Correlating Committee directs that this proposal be referred to Code Making Panel 15 for information.

Submitter: Donald J. Talka, Underwriters Laboratories

Recommendation:

Revise text to read as follows:
700.21 Switch Location.
All manual switches for controlling emergency circuits shall be in locations convenient to authorized persons responsible for their actuation. ~~In places of assembly, such as theaters.~~ In facilities covered by Articles 518 and 520 a switch for controlling emergency lighting systems shall be located in the lobby or at a place conveniently accessible thereto.
In no case shall a control switch for emergency lighting ~~in a theater, motion-picture theater, or place of assembly~~ be placed in a motion-picture projection booth or on a stage or platform.
Exception: Where multiple switches are provided, one such switch shall be permitted in such locations where arranged so that it can energize the circuit only but cannot de-energize the circuit.

Substantiation:

This is to correlate with the revised title and scope of Article 518, Assembly Occupancies, as submitted by Code-Making Panel 15. These revisions also serve to clarify the intermingling of occupancies covered by 518 and 520 in the body of 700.21.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-134 Log #3033 NEC-P13 **Final Action: Accept**
(700-27)

Submitter: Todd Lottmann St Louis, MO

Recommendation:

Add the following to Part VI of Article 700
700.27 Series Rated Combinations.
Series Rated Combinations shall not be used in emergency systems.

Substantiation:

Series Rated Combinations use two devices to clear a fault, both the upstream fuse or circuit breaker and the downstream circuit breaker. If a fault occurs on an emergency system, the operation of the upstream device could take down the entire emergency system. This would create a situation that is unsafe for human life and violate the scope of Article 700. Series Rated Combinations must not be allowed in emergency systems for this reason.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: No substantiation was provided that series rated combinations do not work. The flexibility to use both circuit breaker and fuse in a series combinations may actually increase safety by providing a superior disconnecting means. This limitation on the use of series combinations should be rejected.

13-135 Log #3034 NEC-P13 **Final Action: Accept in Principle in Part**
(700-28)

Submitter: Todd Lottmann St Louis, MO

Recommendation:

Add the following to Part VI of Article 700:
700.28 Selective Coordination.
All overcurrent protective devices in emergency systems shall be selectively coordinated to ensure proper isolation and localization of a fault by the overcurrent devices closest to the fault condition and preventing loss of power to other unaffected parts of the emergency system.

Substantiation:

The requirements contained in Article 700 focus on providing a reliable emergency system that will be operational when called upon for its use as supported by the maintenance and testing requirements in 700.4. The critical nature of the dependence on emergency systems for safety of human life, as stated in the scope, supports these requirements. This article specifically mandates that the emergency circuits be separated from the normal circuits as shown in 700.9(B) and that the wiring be specifically located to minimize system hazards as shown in 700.9(C), all of which reduce the probability of faults or failures to the system so it will be operational when called upon. With the interaction of this article for emergency lighting for egress, it is imperative that the lighting system remain operational in an emergency. Failure of one component must not result in a condition where a means of egress will be in total darkness as shown in 700.16. In addition, the allowance to bypass the alternative source ground fault protection for equipment shows the preference for system operation in the event of an emergency and the fact that if a fault occurs we do not want the whole system to go down and create an unsafe situation for human life. Selectively coordinated overcurrent protective devices will provide a system that will support all these requirements and principles. With properly selected overcurrent protective devices, a fault in the emergency system will be localized to the overcurrent protective device nearest the fault allowing the remainder of the system to be functional as all the previously mentioned requirements intend to do. Due to the critical nature of the emergency system uptime, selective coordination must be mandated for emergency systems. This can be accomplished by both fuses and circuit breakers based on the system design and the selection of the appropriate overcurrent protective devices.

Panel Meeting Action: Accept in Principle in Part

Delete 700.25 FPN and add New Section 700.28 to read as follows:

"700.28 Coordination. Emergency system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices."

Panel Statement:

The panel agrees that selective coordination of emergency system overcurrent devices with the supply side overcurrent devices will provide for a more reliable emergency system. By excepting in principle this proposal the FPN in Section 700.25 is no longer needed to alert users about selective coordination. The part the panel accepts is selective coordination of emergency systems. The panel's wording accomplishes the intent of the submitter without adding design aspects of selective coordination into this section.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: Perfectly selective coordination is not always possible for all fault current levels when protection is provided by common molded case circuit breakers. This requirement will force the use of fuses which may expose workers to energized parts during replacement or the use of more sophisticated breakers with complex settings which are more likely to be mis-set resulting in false trips. Reliability and safety of these services are best served by the existing NEC FPN wording which alerts the user to the need for selectivity when possible.

13-136 Log #1024 NEC-P13 **Final Action: Reject**
(701-4)

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Add, "Generator sets shall be listed for use on legally required standby systems.

Substantiation:

UL Standard 2200 has been published for listing legally required standby generator sets for stationary installations. Multiple manufacturers have listed generator set equipment available. Listing of generator sets can provide a consistent basis for approval of equipment by the authority having jurisdiction based on a published standard for safety. Listing relieves the authority having jurisdiction of the burden of examination of equipment for which the AHJ lacks resources or facilities.

Panel Meeting Action: Reject

Panel Statement:

See panel action on Proposal 13-108.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-137 Log #1020 NEC-P13 **Final Action: Accept in Principle in Part**
(701-6)

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Revise text to read as follows:
The alternate power source shall be permitted to supply legally required standby, and optional standby loads where the source has adequate capacity or where automatic selective load pickup and load shedding is provided as needed to ensure adequate power to the legally required standby circuits.

Substantiation:

Proposal adds "where the source has adequate capacity or" so that load shed and add is not required if the source has the capacity to supply all the connected loads.

Panel Meeting Action: Accept in Principle in Part

Revise the second paragraph of 701.6 to read follows:

701.6 Capacity and Rating. ~~The alternate power source shall be permitted to supply legally required standby and optional standby system loads where automatic selective load pickup and load shedding is provided as needed to ensure adequate power to the legally required circuits.~~ The legally required standby alternate power source shall be permitted to supply both legally required standby and optional standby system loads under any of the following conditions:

(1) Where the alternate source has adequate capacity to handle all connected loads.

(2) Where automatic selective load pickup and load shedding is provided that will ensure adequate power to the legally required standby circuits.

Panel Statement:

The panel agrees that it is acceptable to have either an alternate power source with sufficient capacity to handle all connected legally required standby and optional loads or automatic selective load pickup and load shedding for the optional loads. In both cases the legally required standby loads will have adequate supply. The panel reworded the paragraph to make it easier to read and understand. The part accepted is adding a source with adequate capacity and meets the intent of the submitter.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-138 Log #1025 NEC-P13 **Final Action: Accept**
(701-7(A))

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Revise text to read as follows:
Transfer equipment, including automatic transfer switches, shall be automatic and listed for standby use and approved by the authority having jurisdiction.

Substantiation:

By substituting the term "listed" for the presently used "identified" which are both defined terms, this proposal intends to require that this equipment be subject to periodic follow-up inspection of production equipment to ensure suitability for legally required standby purposes.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 2

Explanation of Negative:

ELKINS: The submitter did not provide substantiation that requiring the increased cost of "listed" transfer equipment was justified nor made substantive improvement to reliability. No examples, failures or misapplication risks were cited in the substantiation.
HORNBERGER: This proposal should be rejected. The submitter did not offer any technical substantiation to support the requirement for listing. The requirement for listing is not necessary if the equipment is identified and approved by the authority having jurisdiction. Also, the requirement for listing would obviate the need for approval by the authority having jurisdiction.

13-139 Log #2279 NEC-P13 **Final Action: Reject**
(701-9(B))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
701.9 Signs.
(A) Mandated Standby. A sign shall be placed at the service entrance indicating type and location of on-site legally required standby power sources.
Exception: A sign shall not be required for individual unit equipment as specified in 701.11(F).
(B) Grounding. Where the ~~grounded~~ earth circuit conductor connected to the legally required standby power source is connected to a grounding electrode conductor at a location remote from the legally required standby power source, there shall be a sign at the grounding location that shall identify all legally required standby power and normal sources connected at that location.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-140 Log #1284 NEC-P13 **Final Action: Accept in Principle**
(701-11(B)(5))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(B) Generator Set.
(5) Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors enter or pass through the building or structure.

Substantiation:

The new text would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit entering or passing through a separate building or structure as required by 225.31.

Panel Meeting Action: Accept in Principle

Change "…enter…" to "…serve…".

Panel Statement:

See panel action on Proposal 13-124.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-141 Log #3100 NEC-P13 **Final Action: Accept in Principle**
(701-11(B)(5))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: James W. Carpenter, International Association of Electrical Inspectors

Recommendation:

Add the phrase "supply or" before the word "pass" in the 5th line down in 701.11(B)(5) to read as follows:
"701.11 Legally Required Standby Systems.
(B) Generator Set.
(5) Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors supply or pass through the building or structure."

Substantiation:

Add the phase "supply or" before the word "pass". The new text would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit supplying or passing through a separate building or structure in accordance with 225.31 as intended by the Panel for 2002.

Panel Meeting Action: Accept in Principle

Change "…supply…" to "…serve…".

Panel Statement:

See panel action on Proposal 13-124.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-142 Log #669 NEC-P13 **Final Action: Accept**
(701-11(D))

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise: Where acceptable to the authority having jurisdiction as a source of power, ~~a second~~ an additional service shall be permitted. This service shall be in accordance with the applicable provisions of Article 230, with separate service drop or lateral ~~widely separated~~ sufficiently remote electrically and physically from ~~the normal~~ any other service to minimize the possibility of simultaneous interruption of supply from an occurrence in another service.

Substantiation:

A permitted additional service may not be a second service. Separation is warranted not only from a "normal" service (not defined) but any other service, such as for fire pumps, which may not be considered a "normal" service.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-143 Log #170 NEC-P13 **Final Action: Accept in Principle in Part**
(701-11(F) (New))

TCC Action:

The Technical Correlating Committee directs that the Action on this Proposal be rewritten to comply with the NEC Style Manual to read as follows: "Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692." and change "may" to "shall" in the last sentence.

Submitter: Frank Seiler, Access Wiring

Recommendation:

Add new text to read as follows:
701.11(F) Fuel Cell System. Fuel cell systems used as a source of power for optional standby systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.
Installation of a fuel cell system shall meet the requirements of Article 691.
Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it may not serve as the sole source of power for the optional standby system.

Substantiation:

It seems clear that the present pace of research, development, and testing of fuel cell technology will have matured to the point where such systems may be in general use by the 2005 through 2007 code cycle. Reliability is matched to already existing sources of power for emergency standby systems. For reference, I have provided an article from the January issue of Electrical Contractor Magazine, Fuel Cells Now: An Update. It, along with the material referenced in the article supports the need of this code provision.
The above proposal would be a logical insertion, moving the existing 701.11(F) to become 701.11(G).
Code language mirrors that of the rest of the article. The 2 hour requirement mirrors that of 701.11(B)(2). It seems logical to have the same time requirement of this fuel source.
Note: Supporting Material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle in Part

(1) Renumber existing 701.11(F) Unit Equipment as follows:
701.11(G) Unit Equipment
(2) Add the submitter's new article 701.11(F) Fuel Cell System
(3) Correct the submitter's reference from Article 691 to Article 692

Panel Statement:

The panel's action meets the intent of the submitter. Article 692 is the correct reference to Fuel Cells. The entire proposal is accepted except the incorrect reference.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-144 Log #3032 NEC-P13 **Final Action: Accept**
(701-18)

Submitter: Todd Lottmann St Louis, MO

Recommendation:

Add the following to Part IV of Article 701:
701.18 Series Rated Combinations.
Series Rated Combinations shall not be used in legally required standby systems.

Substantiation:

Series Rated Combinations use two devices to clear a fault, both the upstream fuse or circuit breaker and the downstream circuit breaker. If a fault occurs on a legally required standby system, the operation of the upstream device could take down the entire legally required standby system. This would create a situation that is unsafe for human life and violate the scope of Article 701. Series Rated Combinations must not be allowed in legally required standby systems for this reason.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: No substantiation was provided that series rated combinations do not work. The flexibility to use both circuit breaker and fuse in a series combinations may actually increase safety by providing a superior disconnecting means. This limitation on the use of series combinations should be rejected.

13-145 Log #3031 NEC-P13 (701-19) **Final Action: Accept in Principle in Part**

Submitter: Todd Lottmann St Louis, MO

Recommendation:

Add the following to Part IV of Article 701:
701.19 Selective Coordination.
All overcurrent protective devices in legally required standby systems shall be selectively coordinated to ensure proper isolation and localization of a fault by the overcurrent devices closest to the fault condition and preventing loss of power to other unaffected parts of the legally required standby system.

Substantiation:

The requirements contained in Article 701 focus on providing a reliable legally required standby system which will be operational when called upon for its use as supported by the maintenance and testing requirements in 701.5. The critical nature of dependence on legally required standby systems for power to critical circuits for emergency rescue operations and ventilation, as stated in 701.2, supports these requirements. This article allows the legally required standby circuits to be contained within the same raceways as general wiring, as shown in 701.10, which creates a higher probability of faults or failures to the system resulting in operation of one or more overcurrent protective devices and loss of power to major portions of this system. In addition, the allowance to bypass the alternate source ground fault protection for equipment shows the preference for system operation in the event of an emergency and the fact that if a fault occurs we do not want the whole system to go down and create an unsafe situation. Selectively coordinated overcurrent protective devices will provide a system that will support all these requirements and principles. With properly selected overcurrent protective devices, a fault in the legally required standby system will be localized to the overcurrent protective device nearest the fault allowing the remainder of the system to be functional as all the previously mentioned requirements intend to do. Due to the critical nature of the legally required standby system uptime, selective coordination must be mandated. This can be accomplished by both fuses and circuit breakers, based on the system design and the selection of the appropriate overcurrent protective devices.

Panel Meeting Action: Accept in Principle in Part

Add new Section 701.19 to read as follows:

701.19 Coordination. Legally required standby system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices.

Panel Statement:

The panel agrees that selective coordination of legally required systems overcurrent devices with the supply side overcurrent devices will provide for a more reliable legally required standby system. The part the panel accepts is selective coordination of legally required overcurrent devices. The panel's wording accomplishes the intent of the submitter without adding design aspects of selective coordination.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: Perfectly selective coordination is not always possible for all fault current levels when protection is provided by common molded case circuit breakers. This requirement will force the use of fuses which may expose workers to energized parts during replacement or the use of more sophisticated breakers with complex settings which are more likely to be mis-set resulting in false trips. Reliability and safety of these services would be best served by an FPN (see 700.25 FPN) which alerts the user to the need for selectivity when possible.

13-146 Log #666 NEC-P13 (702-2) **Final Action: Accept**

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise first sentence: Those systems intended to ~~protect~~ supply power to public or private facilities where life safety does not depend on the performance of the system.

Substantiation:

Edit. These systems are not necessarily intended to protect anything. They may be installed simply to avoid discomfort or irritation caused by a normal supply power outage.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-147 Log #1018 NEC-P13 **Final Action: Reject**
(702-6 (New))

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Add text to read as follows:
Where an outdoor housed generator set located within sight of the building or structure is equipped with a readily accesible disconnecting means, an additional disconnecting means shall not be required where ungrounded conductors pass through the building or structure.

Substantiation:

Outdoor generator are often used for optional systems, and the disconnecting means should be allowed to be located within the generator enclosure.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 13-123.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

ELKINS: Generators are commonly supplied with accessory compartments containing the generator breaker. None of these disconnects are visible unless the accessory cover or door is opened. Exposing the breaker to the elements to make it always visible would lower the reliability of the installation in most environments. Even for a generator located three ft from a building, the disconnect would not be visible unless the door or cover on the accessory compartment faced the breaker and faced the building. The purpose of the "in sight of" provision is satisfied if the disconnect on a generator in sight of a building (50 ft or less by definition) can be readily reached to confirm its position.

13-148 Log #2924 NEC-P13 **Final Action: Accept in Principle**
(702-6 Exception (New))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add the following exception immediately after the existing text in 702.6:
Exception: Temporary connection of a portable generator without transfer equipment shall be permitted in industrial facilities installations where conditions of maintenance and supervision insure that only qualified persons service the installation and where the normal supply is physically isolated by a lockable disconnect means or by disconnection of the normal supply conductors.

Substantiation:

When installed by qualified personnel in an industrial environment, a generator connected temporarily to an existing distribution system which has been properly isolated from the normal supply and locked out provides a safe source of portable power.

Panel Meeting Action: Accept in Principle

Add the following exception immediately after the existing text in 702.6:
Exception: Temporary connection of a portable generator without transfer equipment shall be permitted in industrial installations, with written safety procedures, where conditions of maintenance and supervision insure that only qualified persons service the installation and where the normal supply is physically isolated by a lockable disconnect means or by disconnection of the normal supply conductors.

Panel Statement:

The phrase written safety procedures is consistant with 430.102(B), Exception (b) and meets the intent of the submitter.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

HORNBERGER: A temporary connection of a portable generator should not be limited to "industrial" installations. This type of installation is regularly installed in commercial and retail facilities for emergency repair of equipment or to provide power during an extended service outage. Many state laws recognize the installation, without a transfer switch, for temporary, emergency basis, only.

13-149 Log #997 NEC-P13 **Final Action: Accept**
(702-7 Exception (New))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Add an Exception to read as follows:
Exception: Signals shall not be required for portable standby power sources.

Substantiation:

This section made perfect sense when only permanently installed sources were included in the scope of Article 702. Now that portable sources are included, there is no point in signaling derangement or carrying load in a system that must be manually connected and may not even be on site until a power outage occurs. Essentially, for a portable source, it is always "deranged" until connected and the fact that it is carrying load is obvious to the user who had to hook it up. In some cases, the same generator may not even be used for each event, or there may only be a provision for hooking up a generator in the event the user chooses to acquire one. Furthermore, many if not most small portable generators sold and used for this purpose have no provision for furnishing an external signal when carrying load. (This point is actually covered in the existing language "where practicable" but unfortunately, most code users do not know what practicable means and usually confuse the term with either "possible" or "practical". For portable sources, especially small portable sources, the signals are usually "possible" and seldom "practical" or "practicable.") Another possible approach to this problem is to require signals only from those systems that have automatic transfer means.

Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

13-150 Log #2280 NEC-P13 **Final Action: Reject**
(702-8(B))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
702.8 Signs.
(A) Standby. A sign shall be placed at the service-entrance equipment that indicates the type and location of on-site optional standby power sources. A sign shall not be required for individual unit equipment for standby illumination.
(B) Grounding. Where the ~~grounded~~ earth circuit conductor connected to the optional standby power source is connected to a grounding electrode conductor at a location remote from the optional standby power source, there shall be a sign at the grounding location that shall identify all optional standby power and normal sources connected at that location.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject
Panel Statement:

The revised wording does not provide clarity.

Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

13-151 Log #2002 NEC-P13 **Final Action: Reject**
(702-10(B))

Submitter: Donald A. Ganiere Ottawa, IL

Recommendation:

Revise text as follows:
(B) Nonseparately Derived System. Where a portable optional standby source is used as a nonseparately derived system, the equipment ~~grounding~~ bonding conductor shall be bonded to the system grounding electrode.

Substantiation:

This is a coordinating proposal to my proposal to change the term "equipment grounding conductor" to "equipment bonding conductor" in Article 250.

Panel Meeting Action: Reject

Panel Statement:

See the panel action and statement on Proposal 13-1.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13 Negative: 1

Explanation of Negative:

HORNBERGER: "Grounded" and "grounding" sound similar but are intended to describe two totally different concepts. However, these terms are often used interchangeably by users of the NEC. In fact, there are places in the NEC where these terms are used interchangeably. The words ground, grounded and grounding will apply to the concept of connecting an electrical system to the earth. While the words bond, bonded and bonding will apply to the concept of connecting together noncurrent carrying conductive parts likely to become energized so that they form an effective ground fault path back to the source. If the terms are not similar, the concepts can be more easily differentiated by the users. This change will greatly improve usability and understanding of the NEC. This issue needs to be brought forth through the Technical Correlating Committee and the use of the individual terms should be evaluated on their merit on a case-by-case basis.

For example, the term ground fault used in the above paragraph describes a particular type of electrical fault and is used appropriately in the above text.

13-152 Log #1285 NEC-P13 **Final Action: Accept in Principle**
(702-11)

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add new text to read as follows:
IV. Sources of Power
702.11 Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors enter or pass through the building or structure.

Substantiation:

The new Part would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit entering or passing through a separate building or structure as required by 225.31 with the same text as provided for generator sets for emergency and legally required standby generators.

Panel Meeting Action: Accept in Principle

Change "…enter…" to "…serve…".

Panel Statement:

See panel action on Proposal 13-124.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-153 Log #1522 NEC-P13 **Final Action: Reject**
(702-11 (New))

Submitter: Lawrence A. Bey, Cummins Power Generation

Recommendation:

Add new text to read as follows:
The alternate source for optional systems shall not be required to have ground fault protection of equipment with automatic disconnecting means.

Substantiation:

Optional systems often serve critical load equipment, such as telecommunications, data centers, etc. The requirement for feeder ground fault protection of equipment 215.10, should not be imposed on these types of systems.

Panel Meeting Action: Reject

Panel Statement:

Optional standby systems are typically installed to provide an alternate source of electric power for such facilities as industrial and commercial buildings, farms, and residences and to serve loads such as heating and refrigeration systems, data processing and communications systems, and industrial processes that, when stopped during any power outage, could cause discomfort, serious interruption of the process, damage to the product or process, or the like." This FPN explains some of the many different types of systems that may use optional standby power. These systems are not life threatening like those found in Articles 700 & 701 where the ground fault protection exemption of equipment is allowed. The life safety need for this exemption is not necessary in article.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-154 Log #2808 NEC-P13 **Final Action: Accept in Principle**
(702-11 (New))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: Henry A. Jenkins, Wake County

Recommendation:

Add a new Part IV. Sources of Power to Article 702 for consistency with Articles 700 and 701.
"702.11 Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, and additional disconnecting means shall not be required where ungrounded conductors enter or pass though the building or structure."

Substantiation:

The new text would permit the disconnecting means for the generator to act as the required disconnecting means for the circuit supplying or passing through a separate building or structure in accordance with 225.31 to be consistent with the same text as provided for generator sets for emergency and legally required standby generators.

Panel Meeting Action: Accept in Principle

Change "…enter…" to "…serve…".

Panel Statement:

See panel action on Proposal 13-124.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-155 Log #3277 NEC-P13 **Final Action: Accept in Principle**
(702-11 (New))

TCC Action:

It was the action of the Technical Correlating Committee that this proposal be reconsidered and correlated with the Action on Proposal 4-26a. This action will be considered by the Panel as a public comment.

Submitter: Joseph A. Hertel, Safety and Buildings / Rep. Dept. of Commerce, State of Wisconsin

Recommendation:

The following language should be added to Article 702 to recognize that generators are used for emergency, legally required and optional standby systems.

702.11 Outdoor Generator Sets. Where an outdoor housed generator set is equipped with a readily accessible disconnecting means located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors pass through the building or structure.

Substantiation:

This language was added to both 700.12(B)(6) and 701.11(B)(5) in the 2002 edition. This statement should be added to Article 702. Generators are used to supply power for one or more of these recognized systems. The installation of a generator for an optional standby system does not differ from that of emergency or legally required systems.

Panel Meeting Action: Accept in Principle

(1) Add a new "Part IV Services of Power" (2) Replace "…pass through…" with "…serve or pass through…".

Panel Statement:

See panel action on Proposal 13-152.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

13-156 Log #150 NEC-P13 **Final Action: Reject**
(705-10, Exceptions Nos. 1 & 2)

Submitter: Michael V. Glenn, Longview Fibre Co.

Recommendation:

Renumber existing exception to "Exception No. 1" and add Exception No. 2 as follows:

Exception No. 2. A permanent plaque or directory shall not be required for industrial installations where the service point disconnecting means is under the exclusive maintenance and operational control of the electric primary source supply system.

Substantiation:

Our industrial facility has three company owned power lines where the service points originate at a utility owned substation. Each of these power lines has a circuit breaker and disconnects that, even though our company owns this equipment and it is our service point, the utility has full operational and maintenance control over this service point equipment. It is impossible for our company to install or dictate that the utility install at the utility substation a directory or plaque for our service equipment or disconnects. The directory or plaque was intended to warn the electric primary source provider of any power production systems that might be operating in parallel with their system. In this particular case, the utility is fully aware of the integrated power system and has full operational control over our service point therefore no unknown parallel power production danger exists. I know of several other industrial facilities in our area that have a similar service point situation. This exemption is needed to cover these types of installations.

Panel Meeting Action: Reject

Panel Statement:

The plaque is for the use of all emergency response personnel, not just the serving utility. The plaque can be made by the industrial facility and placed in close proximity to the service substation, possibly hung on a fence. The plaque alerts all emergency response personnel that there are more than one sources of power, and where the disconnects for these sources are located.

Number Eligible to Vote: 16

Ballot Results: Affirmative: 16

Comment on Affirmative:

3-125 Log #668 NEC-P03 (720-1 Exception) **Final Action: Accept in Principle**

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Add text to as follows:
517, 550, 552.

Substantiation:

Edit. The articles noted cover wiring systems operating at less than 50 volts.

Panel Meeting Action: Accept in Principle

These three references must be added to 720.2.

Panel Statement:

This Proposal was based on a 1999 NEC reference since the exception referenced in the proposal was deleted during the 2002 cycle with the information incorporated into 720.2.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-126 Log #121 NEC-P03 (725) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the action on this proposal is modified by proposals 3-131, 3-133, 3-140, 3-141a, 3-144, 3-145, 3-147, 3-155, 3-157, 3-160, 3-161, 3-162a, 3-167, 3-170, 3-171, 3-173, 3-178, 3-179, 3-186, 3-187, 3-192, 3-210, 3-212, 3-214.

The Technical Correlating Committee directs the chairs of Code-Making Panels 3 and 16 to establish a small task group to consider the sequential numbering proposed by this and similar proposals. With the numbering as accepted, the addition of a new rule to any article would result in renumbering everything following that section. The task group should consider using a larger range of numbers to allow for future expansion of the articles. The task group can develop comments to accomplish this numbering.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber the sections within Articles 725, 760, 770, 800, 820 & 830 as shown on the following table. For information, the following are pro forma rewrites of the Articles assuming that the individual proposals are accepted.

[Recommendation of Proposal 3-126 is shown on page 2072]

Insert Table Here
Insert Table 725.61 Here

(Table Shown on page 2703)

Insert Figure 725.41 [page 2792]

Insert Figure 725.61 [page 2792]

Substantiation:

Section 2.4.1 of the 2001 National Electrical Code Style Manual states:

2.4.1 Parallel Numbering Within Similar Articles. To the extent possible, Code-Making Panels are encouraged to use the same section numbers (and part numbers, where applicable) for the same purposes within articles covering similar subjects.

The CMP 16 Editorial Task Group has prepared a series of proposals such that these Articles conform with the intent of the Style Manual. The Task Group includes myself, S. Egesdal, S. Kaufman, S. Johnson, J. Brunssen, G. Dorna, D. Pirkle and M. Wierenga. Work was undertaken after consultation with the TCC chairman.

Panel Meeting Action: Accept in Principle

Change the reference in 725.82 of the proposal from "725.83(A) through (G)" to "725.82(A) through (G)"

Accept the remainder of the proposal.

Panel Statement:

The reference in 725.82 was corrected as an errata since there isn't a 725.83 and all the listing requirements are found in 725.82.

The recommendation of this proposal includes a draft document in which the title numbers were changed to a parallel numbering sequence with 760, 770, 800, 820, and 830. The spreadsheet included after the draft was provided to assist in tracking the section number changes for each article and to provide the suggested title changes. The spreadsheet was not intended to be a part of the recommendation.

The internal text within each section was not changed so acceptance of this proposal is not intended to indicate the text within the section won't be changed by the action on another proposal.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-128 Log #3307 NEC-P03 **Final Action: Reject**
(725-2–Circuit Integrity (CI) Cable (New))

Submitter: Edward Walton, Draka USA

Recommendation:

Add the following definition:
Circuit Integrity (CI) Cable. Cable used for remote-control, signaling, and power-limited circuits that are critical to life safety, property protection, or emergency management in order to ensure continued operation for a specified time under fire conditions.

Substantiation:

This definition supports a term used in a proposal for Section 725.71(F).
A heightened interest in the ability to maintain certain operations throughout the entire time of an emergency has prompted numerous agencies to require that steps be taken to assure the circuit integrity and survivability of certain critical remote-control, signaling, and power-limited circuts is during a fire in a building. It is vitally important that NFPA 70, National Electrical Code, offer a code-complying method for meeting these requirements.
Designers and installers of electrical systems, continually seek performance guidance from the NEC in order to assure the safety of electrical installations. It behooves the NEC to make certain that it makes suitable provisions to recognize specialized electrical components and installation methods that will allow building owners to meet requirements of other documents that seek to assure life safety, property protection, an emergency management.

Panel Meeting Action: Reject

Panel Statement:

Adding a definition into Section 725.2 implies that there is a usage for that particular cable within Article 725. The other related proposal mentioned in the substantiation is providing listing and marking requirements for the cable without providing any usage of this particular cable within Article 725. There has not been any substantiation submitted providing technical data on the types of circuits and the reason for the survivability of the cable that should be covered by this circuit integrity cable.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-127 Log #2437 NEC-P03 **Final Action: Reject**
(725-2 and 760.2)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Adopt the following definitions:
Air Duct. A conduit for conveying air.
Air-Handling Unit Room Plenum. An individual room containing an air-handling unit(s) used to gather return air from various sources and combine the return air within the room for returning to the air-handling unit.
Plenum, Air-Handling Unit Room. See Air-Handling Unit Room Plenum
Plenum, apparatus casing. A fabricated plenum and apparatus casing used for supply, return, or exhaust air service.
Plenum, ceiling cavity. The space between the top of the finished ceiling and the underside of the floor or roof above where used to supply air to the occupied area, or to return or exhaust from the occupied area.
Plenum, duct distribution. A duct enclosure used for the multiple distribution or gathering of ducts or connectors.
Plenum, raised floor. The space between the top of the finished floor and the underside of a raised floor where used to supply air to the occupied area, or to return or exhaust air from or from the occupied area.

Substantiation:

These terms are used in propoals for Articles 725, 760, 770, 800, and 820 and need to be defined.
The source of the definitions is from information in NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.

Panel Meeting Action: Reject

Panel Statement:

The terms are not used in Article 725 and 760. The definition for "air duct" is from the 1999 NFPA 90A edition.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-129 Log #61 NEC-P03 **Final Action: Accept in Principle**
(725-3)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete "Locations and" from the title of these sections to make the section titles "Other Articles."

Substantiation:

The current titles are not in agreement with the 2001 National Electrical Code Style Manual sections 2.5 and 3.3.5.
In the 2002 NEC, the following sections all have the title "Other Articles": 225.2; 372.3; 402.2; 445.3; 500.3; 505.3; 518.3; 545.2; 547.3; 604.3; 650.2; 668.3; 705.2 and 720.2.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action for Section 725.3 in Proposal 3-126 that accomplishes the proposed action.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-130 Log #1744 NEC-P03 **Final Action: Reject**
(725-3)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:
725.3 Locations and Other Articles.
Circuits and equipment shall comply with the articles or sections listed in 725.3(A) through (F). Only those sections of Article 300 referenced in this article shall apply to Class 1, Class 2, and Class 3 circuits.
(A) Number and Size of Conductors in Raceway. Section 300.17.
(B) Spread of Fire or Products of Combustion. Section 300.21. The accessible portion of abandoned Class 2, Class 3, and PLTC cables shall not be permitted to remain.
(C) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22 for Class 1, Class 2, and Class 3 circuits installed in ducts, plenums, or ~~other space used for environmental~~ air air-handling spaces. Type CL2P or CL3P cables shall be permitted for Class 2 and Class 3 circuits in plenums, including ceiling cavity plenums and raised floor plenums. Wiring methods installed in a plenum space shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the plenum space.
(D) Hazardous (Classified) Locations. Articles 500 through 516 and Article 517, Part IV, where installed in hazardous (classified) locations.
(E) Cable Trays. Article 392, where installed in cable tray.
(F) Motor Control Circuits. Article 430, Part VI, where tapped from the load side of the motor branch-circuit protective device(s) as specified in 430.72(A).

Substantiation:

[Text of Proposal 3-130 substantiation is shown on page 2078]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-131 Log #467 NEC-P03 **Final Action: Accept**
(725-3(B), 760.3 (A))

Submitter: Stanley Kaufman, OFS

Recommendation:

Replace "shall not be permitted to remain" with "shall be removed".

Substantiation:

The requirement for the removal of abandoned cables is currently stated as, "The accessible portion of (cable type) cables shall not be permitted to remain." "Shall not be permitted to remain" is a convoluted way of saying, "shall be removed".
Section 3.3.1.2 of the 2001 NEC Style Manual states, "Use simple declarative sentence structure...".
Keep it simple!

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-133 Log #3288 NEC-P03 (725-3(C)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise as follows:

(C) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22 for Class 1, Class 2, and Class 3 circuits installed in ducts, plenums, or other space used for environmental air. Type CL2P or CL3P cables and raceways shall be permitted per 725.61 for Class 2 and Class 3 circuits.

Substantiation:

This is the first of three companion proposals to add Nonmetallic Signaling Raceways to Article 725. The same listed raceways are currently found in Articles 770 and 800 for Optical Fiber and Communication Cables. These raceways are commonly being used for the removal of abandon cables and are ideal for signaling cables that are listed for the purpose.

Panel Meeting Action: Accept in Principle

Revised the proposed to read as follows:

725.3(C) Ducts, Plenums, and Other Air-Handling Spaces. ~~Section 300.22~~ Class 1, Class 2, and Class 3 circuits installed in ducts, plenums, or other space used for environmental air shall comply with 300.22. Type CL2P or CL3P cables and plenum signaling raceways shall be permitted for Class 2 and Class 3 circuits installed in other spaces used for environmental air.

Panel Statement:

Changes in the first sentence were made to provide clarity and to make a complete sentence in accordance with the NEC Style Manual. The change in the second sentence was made to clearly indicate that CL2P and CL3P, and plenum signaling raceways shall not be installed in ducts or plenums, but only in other spaces used for environmental air.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

EGESDAL: The purpose of this comment is to point out an inconsistency in Panel Action on installation of plenum cable in ducts, plenums, and other space used for environmental air.

The Panel Action and Panel Statement on Proposal 3-133 restrict existing plenum cable (Types CL2P and CL3P) and plenum signaling raceway to other space used for environmental air, and prohibits installation in ducts and plenums. The Panel Action and Statement correlate with NFPA 90A and the Air Conditioning Committee's Proposals submitted by Jeff Mattern.

The Panel Action and Panel Statement on Proposal 3-133 contradict the Panel's action of rejecting the Air Conditioning Committee proposals (3-94, 3-132, 3-174, and 3-213), which propose restricting existing plenum cable (Types CL2P and CL3P) to other space used for environmental air (ceiling cavity plenums and raised floor plenums). The Panel Action and Statement does not correlate with Section 725.61, which continues to permit plenum cable to be installed in unrestricted quantities in ducts, plenums, and other space used for environmental air. Based on the Panel Action on Proposal 3-133, the Panel Action on each rejected Air Conditioning Committee's Proposals should be to Accept.

3-132 Log #368 NEC-P03 **Final Action: Reject**
(725-3(C) & 760.3 (B))

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise 725.3(C) and 760.3(B) as follows:

725.3(C) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22 for Class 1, Class 2, and Class 3 circuits installed in ducts, plenums, or other space used for environmental air. Type CL2P or CL3P cables shall be permitted for Class 2 and Class 3 circuits installed in ceiling cavity plenums and raised floor plenums.

760.3(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22 for non-power-limited and power-limited fire alarm circuits, ~~where~~ installed in ducts or plenums or other spaces used for environmental air. Type NPLFP and FPLP cables shall be permitted for non-power-limited and power-limited fire alarm circuits installed in ceiling cavity plenums and raised floor plenums.

~~Exception: As permitted in 760-30(B)(1) and (2) and 760.61(A).~~

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and the development of smoke under standard fire exposures. The purpose of the limitation is to produce the risk of fire spread within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. This proposal prohibits the use on unlisted (non-fire-retardant) outside plant cable in plenums in order to correlate with NFPA 90A.

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

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

EGESDAL: See my Explanation of Negative on 3-213 (Log #443).

KUMANDAN: The NFPA Technical Committee on Air Conditioning is responsible for the requirements that relate to safety to life and property from fire for air handling systems. The NFPA Standards Council has clearly established that the requirements for products and materials in air handling systems, including wire and cable, are under the jurisdiction of the NFPA Committee for Air Conditioning.

There were specific proposals that were submitted with the intent of correlating the NEC with the current edition of NFPA 90A with regard to wire and cable installed in ducts and plenums. It is a fundamental fire protection principle and practice to limit the flammability and smoke development of products and materials installed in air handling spaces. Smoke can spread quickly through the air handling system and can be recirculated throughout the entire structure, which can greatly affect safe evacuation of a building during a fire event. The quantity of smoke developed during fires is not trivial and the HVAC system could create a significant hazard if the smoke is conveyed through the HVAC system into areas of refuge and means of egress for the building.

The NFPA 90A Standard For the Installation of Air Conditioning and Ventilating Systems specifies that plenum rated cable is only for use in ceiling cavity plenums and raised floor plenums. The requirements in NFPA 90A for wire and cable installed in ducts or plenums other than ceiling cavity plenums and raised floor plenums are more stringent. Because ducts are small in area as compared to an air handling ceiling plenum, the more stringent requirements are justified. The concentration of smoke that results from a fire will be higher in the duct because of the smaller area. Other plenum spaces are considered more hazardous because of their proximity to air handling equipment. Smoke from fires that originate near the air handling equipment will be conveyed to other parts of the building faster than fires that are in the ceiling cavity or raised floor plenums.

Acceptance of the definitions presented by the Air Conditioning Committee would have eliminated the current differences in interpretation between the NEC and NFPA 90A related to wire and cable installed in ducts and other plenum spaces. CMP-16 accepted similar proposals during their ROP Meeting, and thus, there is a potential correlation issue between CMP-3 and CMP-16.

3-134 Log #62 NEC-P03 **Final Action: Accept in Principle in Part**
(725-5)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

The proposed changes to Article 725 are incorporated into the actions in Proposal 3-126 as follows:

Accept the proposed recommendation to change 725.5 to 725.7, 725.6 to 725.8, and present 725.8 to 725.11. In the proposed new 725.11(B), change 725.8(A) to 725.11(A).

Reject the remainder of the proposal.

Panel Statement:

The proposed changes to Article 725 are incorporated into the actions in Proposal 3-126. The proposed actions on Article 760 will be addressed in subsequent proposals. The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-135 Log #859 NEC-P03 **Final Action: Reject**
(725-5)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 725.5 as follows:

725.5. Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an excess accumulation of wires and cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 725.5 has been misinterpreted to mean that wires and cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when 725.5 was introduced into the 1993 NEC. At that time CMP 16 stated in response to a proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of wires and cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited wire and cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of wire and cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 640.5, 760.5, 770.7, 800.5, 820.5, and 830.6.

Panel Meeting Action: Reject

Panel Statement:

The interpretation included in the submitters substantiation stating, "cables may not be placed directly on suspended ceilings" only proves that the section as written is clear in its intent. The submitter's proposed addition of the terms "excess " and "sufficient" are vague, and not in accordance with 3.2.1 "unenforceable terms" of the NEC Style Manual.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-136 Log #62a NEC-P03 (725-6) **Final Action: Accept in Principle in Part**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See the Panel Action and Statement on Proposal 3-134.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-137 Log #855 NEC-P03 (725-6) **Final Action: Reject**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 725.6 as follows:

725.6 Mechanical Execution of Work. Class 1, Class 2, and Class 3 circuits shall be installed in a neat and workmanlike manner. Cables and conductors installed exposed on the ~~outer~~ surface of ceilings and sidewalls shall be supported by the ~~structural components of the~~ building structure in such a manner that the cable or conductors will not be damaged by normal building use. Such cables and conductors shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable and conductors. The installation shall also conform with 300.4 (D).

Substantiation:

Section 725.6 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (725.6). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables and conductors. It also makes "ceiling" plural, adds "and conductors" in two locations for consistency, and deletes the word "outer" for correlation with 820.6, 830.7, 640.6, 760.6, and 770.8. This is a companion proposal and is intended to correlate with similar proposals for 800.6, 820.6, 830.7, 640.6, 760.6, and 770.8.

Panel Meeting Action: Reject

Panel Statement:

It is not the intent to limit or eliminate fastening cables and conductors onto baseboards and walls but these cables and conductors should not be supported by building components that will be affected by the weight or substance of the cables. Section 110.2 requires approval of all electrical equipment and conductors installed in accordance with the NEC. The AHJ can and should be able to make the determination whether the cables or conductors are sufficiently supported.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-138 Log #2626 NEC-P03 **Final Action: Reject**
(725-6 and 760.6)

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise 725.6, 760.6 as shown below:
Mechanical Execution of Work. Cables and equipment shall be supported or secured in such a manner that the cable and equipment will not be damaged or create a hazard by normal use of the building.
FPN: One way to determine accepted industry installation practice for cables and equipment is to refer to nationally recognized standards such as the Standard for Installing Commercial Building Telecommunications Cabling ANSI/NECA/BICSI 568.

Substantiation:

The current wording of Section 800.6 is shown below. The other sections are identical except for the application.
"Communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the outer surface of ceiling and sidewalls shall be supported by the structural components of the building structure in such a manner that the cable is not be damaged by normal building use. Such cables shall be attached to structural components by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4(D)."
We eliminated the first sentence due to the fact that "neat" and "workmanlike" is vague and violates the NEC Style Manual. We eliminated the sentences; "Cables installed exposed on the outer surface of ceiling and sidewalls shall be supported by the structural components of the building structure in such a manner that the cable is not be damaged by normal building use. Such cables shall be attached to structural components by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable." Because literal reading would prevent the common industry practice of stapling wiring onto a nonstructural wall or a baseboard. Instead we have proposed a clearer alternative. We eliminated the last sentence by submission of a proposal to move it to the "locations" section.
The ANSI/NECA/BICSI standard provides installation requirements for installing communications cables, connectors, and associated hardware. This standard applies to data wiring in Article 725 (Class 2), optical fiber cables in Article 770, communications cables in Article 800, CATV cable in Article 820, and network-powered cables in Article 830.

Panel Meeting Action: Reject

Panel Statement:

An FPN referencing an installation standard for commercial building telecommunications cabling should not be inserted in Article 725 since this article deals with remote control, signaling, and power-limited systems. If these systems also contain communications systems conductors, then 725.56(D)(1) requires compliance with Article 800 at which time compliance with this installation standard would be appropriate.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

KEDEN: The assumption of the panel is that the ANSI/NECA/BICSI 568 Standard does not encompass the subject matter in Article 725, whereas the submitter states that the standard does apply to Article 725. Although 725.56(D)(1) requires compliance with Article 800 if the systems contain communications systems conductors, the addition of the FPN further strengthens this code provision since the scope of ANSI/NECA/BICSI 568 Standard states, "This standard is intended to be used in describing a "neat and workmanlike manner" as required by the National Electrical Code (NEC), 110-12 and 800-6.

3-139 Log #62b NEC-P03 **Final Action: Accept in Principle in Part**
(725-8)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.
Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.
Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".
Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See the Panel Action and Statement on Proposal 3-134.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-140 Log #547 NEC-P03 (725-9) **Final Action: Accept in Principle**

Submitter: James M. Daly, General Cable

Recommendation:

Delete the phrase "in accordance with Article 250".

Substantiation:

4.1.1 of the NEC Style Manual states that "references shall not be made to an entire article unless additional conditions are specified." 90.3 states that Chapters 1, 2, 3 and 4 apply generally; Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, and 7 for particular conditions."

Panel Meeting Action: Accept in Principle

Delete the entire section as follows:

~~725.9 Class 1, Class 2, and Class 3 Circuit Grounding.~~

~~Class 1, Class 2, and Class 3 circuits and equipment shall be grounded in accordance with Article 250.~~

Panel Statement:

Deleting just the phrase "in accordance with Article 250" would require that all Class 1, 2, and 3 circuits must be grounded. That would be an incorrect statement since not all Class 2 and Class 3 circuits must be grounded as indicated in Section 250.112(I).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-141 Log #62c NEC-P03 (725-11) **Final Action: Accept in Principle in Part**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See the Panel Action and Statement on Proposal 3-134.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-142 Log #548 NEC-P03 (725-21(A)(1)) **Final Action: Reject**

Submitter: James M. Daly, General Cable

Recommendation:

Delete 725.21(A)(1).

Substantiation:

4.1.1 of the NEC Style Manual states that "references shall not be made to an entire article unless additional conditions are specified." 90.3 states that Chapters 1, 2, 3 and 4 apply generally; Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, and 7 for particular conditions."

Panel Meeting Action: Reject

Panel Statement:

Transformers used to supply power-limited Class 1 circuits must comply with the applicable sections within Parts I and II of Article 450. This reference provides the necessary information and, if changed to provide the particular parts would be permissible by the NEC Style Manual. Exempting Class 2 or 3 transformers from Article 450 without a requirement in 725.21 acknowledging compliance with Article 450 for Class 1 circuit transformers may lead to confusion and an assumption that compliance for Class 1 circuits are not necessary.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-141a Log #CP303 NEC-P03 **Final Action: Accept**
(725.21(A)(1))

Submitter: Code-Making Panel 3

Recommendation:

Change the existing text in 725.21(A)(1) to read as follows:
(1) Class 1 Transformers. Transformers used to supply power-limited Class 1 circuits shall comply with the applicable sections within Parts I and II of Article 450.

Substantiation:

This reference provides the necessary information and is permissible by the NEC Style Manual. Exempting Class 1 power- limited transformers from Article 450 without a requirement in 725.21 acknowledging compliance with Article 450 for Class 1 circuit transformers may lead to confusion and an assumption that compliance for Class 1 circuits are not necessary.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-143 Log #3188 NEC-P03 **Final Action: Reject**
(725-23 Exception No. 2 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Mass Electrical Code Adv. Committee

Recommendation:

Designate the existing exception as Exception No. 1 and add a second exception as follows:
Exception No. 2: Conductors qualifying under the provisions of 725.27(C) shall be protected by overcurrent devices rated or set not over 5 amperes for 20 AWG and larger conductors, and not over 3 amperes for 22 AWG conductors.

Substantiation:

This is a companion proposal to another on 725.27 which brings the essential requirements of Article 727 into Article 725, and a third proposal to delete Article 727. The principle substantiation is on the proposal for the new 725.27(C). Please refer to that proposal for more information.

Panel Meeting Action: Reject

Panel Statement:

Adding the information from Article 727 into a new subsection of 725.27 does not accomplish anything more than making Article 725 more complex and difficult to understand.

The original purpose of creating a separate Article 727 was to provide separation from Class 1 circuits and not confuse people with an additional "Class 4" system that had a very specific purpose in industrial wiring. The scope of Article 727 provides the overall concept of ITC in that it is to be used exclusively for instrumentation and control circuits operating at 150 volts and 5 amps or less. Incorporating this information into Article 725 would tend to obscure the information and make it less user-friendly to the industrial facilities wishing to employ this system.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-144 Log #995 NEC-P03 **Final Action: Accept**
(725-24)

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise this section to read:
"Overcurrent devices shall be located as specified in 725.24(A), (B), (C), (D), or (E)."

Substantiation:

As presently worded, the section seems to say that all of the requirements of subsections "(A) through (E)" must be met, when they are actually five different methods of providing overcurrent protection for Class 1 circuits. The proposed language is modeled on the language of 725.41(A) which was "fixed" in the 2002 code.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-145 Log #996 NEC-P03 **Final Action: Accept**
(725-24(C))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise the subsection title to read:
"Branch Circuit Taps."

Substantiation:

The present title, "Transformer Taps", is incorrect and misleading. Taken literally, it can only be applied to transformers, when, in fact, it has nothing to do with and does not even mention transformers in the text. Generally, subsections (A) or (B) cover transformers secondary conductors unless they are protected in accordance with (D). Subsection (B) covers conductors tapped from feeders. Since (C) refers only to "controlled light and power circuits", these are really taps from branch circuits since they are protected by "the branch-circuit overcurrent device(s)" according to the rule.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-146 Log #3126 NEC-P03 **Final Action: Accept in Principle**
(725-24(C))

Submitter: Jonathan R. Althouse, Twin Creeks Enterprises

Recommendation:

Change the title of this paragraph to Class 1 Circuit Taps and replace ~~Transformer Taps~~. There are no changes in the actual paragraph. Paragraph (C) will appear as follows:
(C) ~~Transformer Taps~~ Class 1 Circuit Taps.

Substantiation:

The title of this paragraph is incorrect and misleading. The paragraph is about conductor size and protection of Class 1 circuits tapped from a branch circuit. The paragraph has nothing to do with transformers or transformer taps.

Panel Meeting Action: Accept in Principle

See the Panel Action on Proposal 3-145, which addresses the submitter's intent to change the title of the subsection.

Panel Statement:

Since the tap is coming from a controlled light and power circuit protected by a branch circuit overcurrent protection device, the more appropriate title would be "Branch Circuit Taps."

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-147 Log #549 NEC-P03 **Final Action: Accept in Principle**
(725-25)

Submitter: James M. Daly, General Cable

Recommendation:

Revise as follows:
~~Installations of class 1 circuits shall be in accordance with Article 300 and the other appropriate articles in Chapter 3.~~ The wiring methods specified in Chapter 3 shall be used for Class 1 circuits.

Substantiation:

4.1.1 of the NEC Style Manual states that "references shall not be made to an entire article unless additional conditions are specified."
90.3 states that Chapters 1, 2, 3 and 4 apply generally; Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions. These latter chapters supplement or modify the general rules. Chapters 1 through 4 apply except as amended by Chapters 5, 6, and 7 for particular conditions."

Panel Meeting Action: Accept in Principle

Revise the proposed text to read as follows:
"Class 1 circuits shall be installed in accordance with Part I of Article 300 and with wiring methods from the appropriate articles in Chapter 3."

Panel Statement:

The sentence was reconstituted to insert the verb in the proper location within the sentence. Part I of Article 300 was added since Class 1 circuits are limited to not more than 600 volts and Part II of Article 300 deals with over 600 volts.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-148 Log #2333 NEC-P03 **Final Action: Reject**
(725-25 Exception No. 3 (New))

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

Recommendation:

Add Exception No. 3 to 725.25 to read:
Exception No. 3: An equipment grounding conductor shall not be required in Type TC cable applied in accordance with the requirements of 336.10(6) when used for Class I wiring provided the equipment grounding conductor is included in the Type TC power cable between the same equipment.

Substantiation:

This proposal is to clarify that when multiple Type TC tray cables that comply with the crush and impact requirements of Type MC tray cable are brought to the utilization equipment or device, only the power cables of Chapters 1 through 4 need to provide the utilization equipment or device grounding. Type TC tray cable brought to the utilization equipment or device to provide Class 1 remote control, signaling and power limited circuits powered as defined in 725.21 shall not be required to provide an equipment grounding conductor.

It is common for an industrial utilization equipment or device to have more than one cable wired between it and a power/control panel or a cable tray. These additional cables are typically used to provide control power and control signals to the equipment or device. Further, for proper control system operation and performance only one grounding conductor is required and must be used, i.e. avoidance of ground loop currents.

This proposal allows Type TC "open wiring" listed cable to be used in Class 1 power circuits without the need to include an equipment grounding conductor. This is similar to the use of PLTC in Class 2 and Class 3 powered circuits without an equipment grounding conductor, see 725.61(D)(4). This proposal is in line with 336.10 that allows the use of listed Type TC "Open Wiring" in power circuits.

Panel Meeting Action: Reject

Panel Statement:

The power cable supplying power to the equipment may be fed from a different source of power from the Class 1 circuit. Deleting the requirement for the equipment grounding conductor (EGC) for the Class 1 circuits could isolate the Class 1 circuit from the safety ground necessary in case of a ground fault in the control circuit. It may also cause an increase in impedance in a fault condition.

300.3(B) requires all conductors of the same circuit to be contained within the same raceway, auxiliary gutter, cable tray, cablebus assembly, trench, cable, or cord, with some exceptions. Relying upon the EGC for the power circuit might not provide the proper ground return path for the Class 1 circuit.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-149 Log #2012 NEC-P03 **Final Action: Reject**
(725-26(B) and (C) (New))

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute - Electric Light & Power Group

Recommendation:

Add the words, "power-limited" in various places of Article 725.26(B), and add a new Section 725.26(C) as follows:
725.26(B) Class 1 Power-Limited Circuits with Power Supply Circuits. Class 1 power-limited circuits shall be permitted to be installed with power supply conductors as specified in 725.26(B)(1) through (B)(4).
(1) In a Cable, Enclosure, or Raceway. Class 1 power-limited circuits and power supply circuits shall be permitted to occupy the same cable, enclosure, or raceway only where the equipment powered is functionally associated.
(2) In Factory- or Field-Assembled Control Centers. Class 1 power-limited circuits and power supply circuits shall be permitted to be installed in factory- or field-assembled control centers.
(3) In a Manhole. Class 1 power-limited circuits and power supply circuits shall be permitted to be installed as underground conductors in a manhole in accordance with one of the following:
(1) The power-supply or Class 1 power-limited circuit conductors are in a metal enclosed cable or Type UF cable.
(2) The conductors are permanently separated from the power-supply conductors by a continuous firmly fixed nonconductor, such as flexible tubing, in addition to the installation on the wire.
(3) The conductors are permanently and effectively separated from the power supply conductors and securely fastened to racks, insulators, or other approved supports.
(4) In Cable Trays. In cable trays, where the Class 1 power-limited circuit conductors and power-supply conductors not functionally associated with them are separated by a solid fixed barrier of a material compatible with the cable tray, or where the power-supply or Class 1 power-limited circuit conductors are in a metal-enclosed cable.
725.26(C) Class 1 Remote-Control and Signaling Circuits with Power Supply Circuits. Class 1 remote-control and signaling circuits, and power supply circuits shall be permitted to occupy the same cable, enclosure, cable tray, raceway or manhole, provided the insulation on all such conductors is suitable for the maximum voltage present.

Substantiation:

There are two types of Class 1 circuits: the power limited type with a maximum potential of 30 volts, and the non-power limited type (classified remote-control and signaling) with a maximum potential of 600 volts (725.21). It is legitimate to require 30 volt circuits to be separated from 600 volt circuits (unless they are functionally associated). It is not legitimate to require separation of various 600 volt circuits. But that is exactly what the current wording of 725.26(B) mandates. With the exception of fire pump wiring and hospital safety systems, this is the only other place in the code where diverse 600 volt circuits are required to be separated. Such separation cannot be justified based on personnel safety or equipment or conductor protection.
The revision as proposed will accomplish two things:
(1) Require separation of 30 volt maximum (power-limited) circuits from other higher voltage circuits, unless functionally associated.
(2) Allow installation of 600 volt circuits (greater than 30 volts up to and including 600) in common raceways, enclosures, etc. This has been an industry practice for many years (and acceptable until the 2002 code revision). Industry practice (until the 2002 Code revision) was to place 120 volt AC and 125 volt DC circuits used for motor control for example, in the same cable tray/raceway system as other circuits of the same voltage class. No additional hazard is introduced by allowing this while installation costs are potentially reduced.

Panel Meeting Action: Reject

Panel Statement:

Class 1 circuits have always been recognized as a shock or fire hazard so the circuit has been required to comply with the appropriate insulation and isolation of power circuits. Since these circuits must comply with all of the requirements of Part I of Article 300 and the appropriate requirements of any Chapter 3 wiring methods used in the installation, the normal separation or barrier requirements imposed on Class 2, Class 3, or communications circuits are relaxed where the power-limited Class 1 circuits are functionally associated with the related power circuits. There are countless installations where this method has been used without report of any problems.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

HORMAN: This proposal should be accepted. The installation of 120 volt AC and 125 volt DC, Class I remote control and signaling circuits in common cable trays with Class 600 volt (480 V and 208Y/120 volt circuits) power cables has been a safe and economical industry standard method for many years. The 2002 NEC revision inappropriately disallowed this practice without substantiation. The proposal would allow the electrical industry to return to this cost-effective and safe installation method. The proposal will not allow the unrestricted installation of 30 volt, power-limited Class 1 circuits in the same cable tray or manhole as Class 600 volt power supply conductors.

3-150 Log #2737 NEC-P03 **Final Action: Reject**
(725-26(B)(1))

Submitter: Melvin K. Sanders, TECo., Inc.

Recommendation:

Insert 2 new sentences:
"Conductor voltage ratings shall not be less than the maximum operating circuit voltage when contained within the same bundle or raceway. Insulation voltage ratings shall not be permitted as the sole criteria when determining when control circuits are permitted to be within the same cable or raceway."

Substantiation:

This will establish a minimum conductor insulation voltage rating, and inform users that control devices used with control circuits are not designed for, or intended to withstand, the higher energy that may be encountered when conductor insulation failure occurs.

Panel Meeting Action: Reject

Panel Statement:

This information already exists as a minimum insulation rating of 600 volts in Section 725.27(B). All Class 1 insulated conductors within a cable that contains both Class 1 circuits and power circuits must be insulated for 600 volts.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-151 Log #2391 NEC-P03 **Final Action: Reject**
(725-26(B)(4))

Submitter: Paul E. Guidry, Fluor Daniel, Inc.

Recommendation:

Delete entire section 725.26(B)(4).

Substantiation:

The intent of the NEC is supposed to be safety, not dictating design practices. This section was passed last cycle without adequate substantiation supporting a safety issue. The proposals were #16-54 and 16-51a.

Class 1 circuits are required to have 600V insulation per 725.27. Therefore, there isn't any logical reason or safety reason to require tray barriers between Class 1 circuits and 600V power conductors or to have them be installed with type MC cable.

The industrial sector has been installing all 600V lighting and power cables with Class 1 remote control and signaling circuits for many years without problems. This requirement is excessive and unnecessary. I believe there ought to be more thought given as to what type of safety issues exist and what the ramifications will be before making requirements such as this.

Panel Meeting Action: Reject

Panel Statement:

Requiring a barrier or a metal-enclosed cable separates Class 1 power-limited and nonpower-limited circuits from other circuits that are not functionally associated. Normally, low voltage circuits are isolated from power, lighting, and other higher voltage circuits to keep possible short circuits from the higher rated circuits from affecting the power-limited circuits. This separation rule is relaxed somewhat for Class 1 circuits if the same equipment is powered and controlled by conductors run together. In most instances, the disconnecting means for the equipment and the control circuits will be in close proximity to each other so that power can be shut down for the machine: i.e. functionally associated. Permitting both power and Class 1 control in the same cable tray, raceway, or enclosure provides a more efficient use of the wiring method without seriously compromising safety.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-152 Log #925 NEC-P03 **Final Action: Reject**
(725-27 Exception No. 1 (New))

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 12 for information.

Submitter: Harold R. Bisinger, Comsystec

Recommendation:

Add a new Exception No. 1 to 725.27 to read as follows:
Exception No. 1: Where the power source is a audio amplifier output circuit with a nominal RMS voltage of 100 volts or less, a listed Type CL3 cable is permitted provided it is installed in raceway and approved enclosures, the raceway and enclosures are only occupied by other cables of the same type and utilization and the ampacity of the cable is not exceeded.

Substantiation:

The commercial sound industry has long relied on twisted pair audio cables designed for use in sound systems to connect the output of audio amplifiers to their speaker loads. While these cables are readily available from manufacturers in CL3 and CL2 designations, some larger amplifiers require Class 1 output wiring per ANSI/UL section 813 testing procedures. No manufacturer produces a stock twisted pair audio cable listed for Class 1 use.
725.27(B) effectively limits the choices of 18 and 16 AWG audio wiring in raceways to 600 volts insulation and the mostly unsuitable (without further custom fabrication) selection of fixture wire types given. 18 and 16 AWG wiring is utilized by a large portion of constant voltage distributed sound systems. Amplifier outputs carrying audio program material to distributed speaker systems are distinct from other Class 1 sources. Since most of these systems operate at a maximum voltage of 70.7 volts, the 300 volt insulation of Type CL3 cables is adequate. When run in a raceway, which is limited in occupancy to other similar cables of the same type and use, this exception maintains the intent of the Article while providing a large selection of suitable wiring material for this particular application. This will also help with compliance, since material is readily available and pulling/termination labor cost is reduced.

Panel Meeting Action: Reject

Panel Statement:

This Exception should have been proposed for Section 640.9(C) since the output wiring of audio amplifiers is covered there. That section states that amplifiers with output circuits carrying audio program signals shall be permitted to employ Class 1, Class 2, or Class 3 wiring where the amplifier is listed and marked for the specific class of wiring method. Putting this exception into 725.27 would not override the requirement in 640.9(C) as just stated. Inserting this exception into 640.9(C) would result in an exception to this rule, but not when located in Article 725.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-153 Log #1126 NEC-P03 **Final Action: Reject**
(725-27(B))

Submitter: Chuck Monasmith, Fluor Federal Services

Recommendation:

Add new wording to read as follows:
Insulation suitable for 300 volts shall be permitted only when the following conditions exist. 1) The nominal voltage of the Class I circuit is less than 50 volts, and 2) No other conductors in the same cable, cable tray, enclosure or raceway exceed 150 volts to ground.

Substantiation:

Low voltage control circuits often exceed the power limited requirements of Class 2 power supplies. 600 volt insulation far exceeds the level of insulation required to protect personnel or property and equipment from class 1 low voltage conductors.

Panel Meeting Action: Reject

Panel Statement:

There was no substantiation given to make this change, other than the 600-volt insulation for the Class 1 power-limited circuit far exceeded the level needed. Permitting some power-limited Class 1 circuits to use 300-volt insulation and requiring some to use 600-volt insulation would be very difficult to inspect and control. Six hundred (600) volt conductors with 15-mil thick insulation are readily available.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-154 Log #3190 NEC-P03 **Final Action: Reject**
(725-27(C) (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Mass Electrical Code Adv. Committee

Recommendation:

Add a new subsection (C) as follows:
(C) Instrumentation Tray Cable, Type ITC. Class 1 control circuits other than those covered in 725.8(A) shall be permitted to be wired using multiconductor factory-assembled cables containing two or more conductors with insulation rated for 300 volts, cabled with or without grounding conductor(s), and enclosed in a nonmetallic sheath. The cables shall be permitted to be shielded, and a metallic sheath or armor shall be permitted to be applied over the nonmetallic jacket.
(1) Uses Permitted. Type ITC cable shall be permitted to be used in industrial establishments where the conditions of maintenance and supervision assure that only qualified persons will service the installation. The cable shall be provided with additional protection and support as follows:
(1) In cable trays.
(2) In raceways.
(3) In hazardous locations as permitted in 501.4, 502.4, 504.20, 504.30, 504.80, and 505.15.
(4) As open wiring where enclosed in a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor applied over the nonmetallic sheath in accordance with this section. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).
(5) As open wiring without a metallic sheath or armor between cable tray and equipment in lengths not to exceed 15 m (50 ft), where the cable is supported and protected against physical damage using mechanical protection, such as struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).
(6) As open wiring between cable tray and equipment in lengths not to exceed 15 m (50 ft), where the cable complies with the crush and impact requirements of Type MC cable and is identified for such use. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).
(7) As aerial cable on a messenger.
(8) Direct buried where identified for the use.
(9) Under raised floors in rooms containing industrial process control equipment and rack rooms where arranged to prevent damage to the cable.
(10) Under raised floors in information technology equipment rooms in accordance with 645.5(D)(5)(c).
(2) Uses Not Permitted. Type ITC cables shall not be installed for circuits operating at more than 150 volts nominal, or more than 5.0 amperes. Type ITC cable shall only be run with other cables if the articles governing such other cables contemplate routing Type ITC cable with such other cables, and only to the extent permitted in those articles. Type ITC cable shall not be installed with power, lighting, or other non-power limited circuits.
Exception No. 1: Type ITC cable shall be permitted to terminate within enclosures where the conductors are permanently and effectively separated from other nonpower limited conductors in accordance with the requirements for the separation of Class 2 and Class 3 circuits from nonpower limited circuits in 725.55(B), 725.55(C), 725.55(D), or 725.55(E). For the purposes of applying 725.55(D)(2)a. only, the insulation on Type ITC cables shall be assumed to be equivalent to Class 3 insulation.
Exception No. 2: Type ITC cable shall be permitted to be installed with power, lighting or other nonpower limited circuits where otherwise permitted for Class 1 circuits by this article, and in addition where a smooth metallic sheath, welded and corrugated metallic sheath, or interlocking metallic tape armor is applied over the nonmetallic jacket.
(3) Construction. The insulated conductors of Type ITC cable shall be in sizes 22 AWG through 12 AWG. The conductor material shall be copper or thermocouple alloy. The cable shall be listed as being resistant to the spread of fire. The outer jacket shall be sunlight and moisture resistant. Where a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor is applied over the nonmetallic sheath, an overall nonmetallic jacket shall not be required.
(4) Marking. Type ITC cable shall be marked in accordance with 310.11(A)(2), (3), (4), and (5). Voltage ratings shall not be marked on the cable.
(5) Bends. Bends in Type ITC cable shall be made so as to not damage the cable.

Substantiation:

This proposal and its two companions incorporate the concepts in NEC Article 727 into Article 725. The proposal has been updated twice since the version submitted in the 1996 cycle to incorporate the changes CMP 16 made in subsequent versions of Art. 727. Leaving a separate Article 727 in place leaves a standing, unavoidable conflict with other provisions in Article 725. In effect, it retains the disadvantages of the rejected Class 4 circuit concept with the additional confusion that inevitably stems from the fact that Article 727 wiring is for control circuits and not power circuits. We have no problem with and well understand the goals of the proponents of that article, but we cannot support the means.
There are a few changes from Article 727. The 600-volt insulation rule is retained for safety control equipment where a failure would create a direct fire or life hazard. Section 725.27(C)(1)c. excludes Article 504 because Class 1 circuits are not intrinsically safe. The cable could certainly be used for IS circuits, but not under this part of Article 725. Section 725.27(C)(2) Exception No. 1 includes a specific description of exactly how one maintains "separations...by other means."
The only other way to accomplish the goals of Article 727 would be to include this wiring under the Class 3 category. That has merit if the users of ITC cable can live with the power limitations. On balance, the Advisory Committee has chosen this approach, as Class 1, because we believe in the objectives of the Article 727 submitters so strongly that we don't want to create an unintended barrier to the use of their methodology. As Class 1 they will have a free hand, and yet the separation requirements in place in this proposal are assuring safety in Massachusetts now and we are confident they will nationally if this proposal is accepted.
The Technical Correlating Committee, apparently, is going to have to aggressively address the continuing implicit and inevitable conflict between Art. 725 and 727. A multiple choice example that ran in EC&M Magazine illustrates the problem: Suppose you run a 2A 120V control circuit for a motor contactor using the new Type ITC cable, with a 5A time-delay fuse for protection. Other than the fuse, there won't be any power limitation on this circuit. What insulation level do you need on this cable?
a. 150 V
b. 300 V
c. 600 V
d. Ask the AHJ.
And here's the answer (on the 1996 NEC) but still applicable):

"d, Sec. 725-27(b); Sec. 727-4. This circuit squarely conforms to the scope of Art. 725, and it cannot be a Class 2 or Class 3 control circuit because it doesn't have a listed source. It's well beyond the allowable energy parameters of such circuits anyway. That makes it a Class 1 control circuit, which has to have 600 V insulation. On the other hand, the fact that it runs in Type ITC cable means it can have 300 V insulation. These two provisions are in direct conflict, leaving the AHJ with a decision. The panel intent is to allow the 300 V insulation level."

We don't see how a stand-alone Art. 727 will ever avoid this problem, and ITC cable, with its extreme power limitations, should never go back into Chapter 3 either. The Massachusetts approach has been working without a single reported problem in this state since its introduction in the 1996 cycle.

Panel Meeting Action: Reject

Panel Statement:

Adding the information from Article 727 into a new subsection of 725.27 does not accomplish anything more than make Article 725 more complex and difficult to understand.

The original purpose of creating a separate Article 727 was to provide separation from Class 1 circuits and not confuse people with an additional "Class 4" system that had a very specific purpose in industrial wiring. The scope of Article 727 provides the overall concept of ITC in that it is to be used exclusively for instrumentation and control circuits operating at 150 volts and 5 amps or less. Incorporating this information into Article 725 would tend to obscure the information and make it less user-friendly to the industrial facilities wishing to employ this system.

The example given in the substantiation should have had an answer of "b" since 727.6 for the construction requirements of ITC cable state that the conductors in the ITC cable must be rated for 300 volts. Therein lies the difference between ITC cable and Class 1 circuits. The originator of Article 727 specifically required the insulation to be rated for 300 volts rather than the 600-volt level required for Class 1 circuits, otherwise there was no other reason to have an instrumentation cable.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-155 Log #1710 NEC-P03 **Final Action: Accept**

(725-41(A)(3) Exception)

Submitter: Andrew C. Sargent, Rockwell Automation, Inc.

Recommendation:

Add the following exception and FPN (4):

Exception No. 2: Limited power circuits of listed equipment where these circuits have energy levels rated at or below the limits established in Chapter 9, Tables 11(A) and 11(B).

FPN: Examples of other listed equipment are as follows:

(1) A circuit card listed for use as a Class 2 or Class 3 power source where used as part of a listed assembly

(2) A current-limiting impedance, listed for the purpose, or part of a listed product, used in conjunction with a non-power limited transformer or a stored energy source, for example, storage battery, to limit the output current..

(3) A thermocouple

(4) Limited Voltage/Current or limited Impedance secondary communications circuits of listed industrial control equipment.

Substantiation:

The scope of UL product safety standards for Class 2 power units (UL 1310), Class 2 and Class 3 transformers (UL 1585) include only equipment having 50 or 60 Hz line connected primary sources. By definition, this prevents manufacturers from obtaining Class 2 listings (and the associated Class 2 product markings) on equipment utilizing power sources such as switching type power supplies, or DC to DC converters.

Listing products as information technology equipment limits the environment (such as ambient temperature and pollution degree) that the equipment may be applied in to levels that exclude most industrial application.

Section 32 of UL 508, the standard for Industrial Control Equipment, addresses isolated secondary circuits. This section recognizes 3 categories that are considered to be free of the risk of electrical shock or fire hazard and suitable for circuits that leave the equipment enclosure. The specific identification is Class 2, Limited Voltage/Current, and Limited impedance circuits. Listed equipment utilizing these types of isolated secondary circuits has been investigated for the energy limitation characteristics and isolation between these circuits and all others.

The energy levels in the digital data communications circuits of UL listed industrial control equipment are characterized as Limited Voltage/Current or Limited Impedance isolated secondary circuits. These circuits are typically intended for networked communication between portions of industrial control equipment systems, between these systems, and from industrial control systems to listed information technology equipment that monitor, program, and control these systems. Examples of these networks include Ethernet, ControlNet, DeviceNet, DataHighway, Fieldbus, and Remote I/O.

Manufacturers of industrial control equipment specify wiring methods for digital data communications circuits that are identical to types used with listed information technology equipment. The energy level within these circuits is no greater in industrial control equipment than similar circuits in information technology equipment. Further UL 508, the Standard for Industrial Control Equipment, requires that these circuits be isolated and both voltage and current limited, making distinction between the shock or fire hazard potential of these circuits and those of products listed to Class 2 or IT equipment standards nonexistent. However, the wiring methods allowed in 725.41 do not explicitly permit installers to apply them in the same manner. This inconsistency is an undue burden on manufacturers and installers of industrial control equipment.

The proposed FPN example should specifically address communications circuits used in industrial control equipment, but the proposed exception to 725.41(A)(3) should remain broad enough to cover a variety of appropriately designed secondary circuits that are used in motor drives, PLCs, and other types of listed equipment.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-156 Log #2629a NEC-P03 **Final Action: Reject**
(725-41(A)(4), Chapter 9 Tables 11(A) and 11(B))

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Delete Section 725.41(A)(4) including the FPN.
Delete "Exception: Limited power circuits used by listed information technology equipment." In Chapter 9 Section Tables 11(A) and 11(B).

Substantiation:

Communications and information technology have converged. Article 800 currently covers traditional telephony and digital telephone circuits. Article 800 also covers computer signaling when the computer signals are run in the same cable.
See [725.56(D)(1)]. The only information/data circuits in Article 725 are those between information technology equipment (computers) that are not run with the same cable with communications circuits. This proposal would simplify the code by bringing all data communications under Article 800. This convergence has already been partially recognized and addressed by the FPN in 800.4 which refers both computer and telephony listing standards. The cabling specified in Article 800 is used for both telephony and information technology. Designers of telecommunications structured cabling systems do not specify the cabling for use with telephony or information technology as these are now transparent (industries have converged).
The recent reorganization of the NEC Code Panels by the Technical Correlating Committee put Article 725 under the jurisdiction of Panel 3 and the communications articles (770, 800, 820, 830) under Panel 16. The data communications (remainder of text missing from proposal)

Panel Meeting Action: Reject

Panel Statement:

Article 725 covers the wiring of information technology equipment, with the exception of any telecommunications connections covered by Article 800. If a Class 2 or 3 circuit is installed with communications circuits in the same cable, then Article 800 would apply. When communications equipment, such as telephones, were designed as electronic devices and not electromechanical devices, existing communications cabling was used to connect computers and other information technology equipment. As the frequencies of Information Technology Equipment (ITE) increased, the category of cables needed for the connection of equipment increased to handle the speed of the information and functions of the equipment. This requirement for ITE in 725.41 must remain as an option for these limited power circuits.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-157 Log #1010 NEC-P03 **Final Action: Accept**
(725-42)

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise to read: "The equipment supplying the circuits shall be durably marked where plainly visible to indicate each circuit that is a Class 2 or Class 3 circuit."

Substantiation:

As presently written, this section is not clear at all as to which equipment is to be marked. Since "equipment" has a very broad definition in Article 100, this section is sometimes interpreted to mean the conduits, boxes, and cables must be marked. Where substitute cable types are used as permitted by 725.61, the section may even be interpreted to mean the cables must be reidentified as Class 2 or Class 3. This proposal is consistent with the reidentification required by 725.52(A), Exception No. 2, and will also serve to clarify that requirement.

Panel Meeting Action: Accept

Panel Statement:

The title of the section indicates that the intent is to mark the Class 2 and 3 circuits. Rearranging the sentence clarifies that the marking requirement is at the equipment where the circuits originate and not on all the raceways, cables, and fittings.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-158 Log #2916 NEC-P03 (725-42) **Final Action: Reject**

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Delete section 725.42.

Substantiation:

The current wording in section 725.42 is too broad and not reasonable. The definition of equipment includes material such as conduit, fittings, raceways, and cable trays. Class 2 and 3 circuits are allowed to be in these items with other circuit types. Identification of this equipment is not practical and may prove to be misleading.

Panel Meeting Action: Reject

Panel Statement:

This section has been clarified to indicate the marking must be at the equipment where the circuit originated and not at all raceways, fittings, or cable trays associated with the distribution of the circuits. See the Panel Action on Proposal 3-157.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-159 Log #2933 NEC-P03 (725-42 Exception (New)) **Final Action: Accept in Principle**

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add an exception to read as follows:
Exception: In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation only the termination points of Class 2 or Class 3 circuit shall be durably marked where plainly visible to indicate each circuit.

Substantiation:

The current wording in 725.42 is too broad and not reasonable. The definition of equipment includes material such as conduit, fittings, raceways and cable trays. Class 2 and 3 circuits are allowed to be in these items with other circuit types. Identification of this equipment is not practical and may prove to be misleading.

Panel Meeting Action: Accept in Principle

Panel Statement:

This section has been clarified to indicate the marking must be at the equipment where the circuit originated and not at all raceways, fittings, or cable trays associated with the distribution of the circuits. See the Panel Action on Proposal 3-157, which addresses the submitter's attempt to clarify the information.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-160 Log #2301 NEC-P03 (725-55(B)) **Final Action: Accept**

Submitter: Daniel J. Kissane, Pass & Seymour/Legrand

Recommendation:

Revise 725.55(B) as follows:
(B) Separated by Barriers. Class 2 and Class 3 circuits shall be permitted to be installed together with <u>the conductors of electric light, power,</u> Class 1, non-power-limited fire alarm circuits, and medium power network-powered broadband communications circuits where they are separated by a barrier.

Substantiation:

Comment 16-72 in the May 2001 ROC resulted in the panel action to make editorial revisions in Article 725. Section 725.55(B) in the 2002 NEC appears to be a rewrite of the first sentence of Exception No. 1 in Section 725-54(a)(1) in the 1999 NEC. In Section 725.55(B) the reference to electric light and power conductors that appeared in Exception No. 1 of 725-54(a)(1) has been omitted. It seems that omitting this reference in Section 725.55(B) may have been inadvertent since there is no technical rationale given for the change.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-161 Log #881 NEC-P03 **Final Action: Accept**
(725-55(G))

Submitter: James M. Daly, General Cable

Recommendation:

Revise as follows:
(G) ~~Article 780~~ Closed-Loop and Programmed Power Distribution. Class 2 and Class 3 conductors ~~as permitted by 780.6(A)~~ shall be permitted to be installed in accordance with ~~Article 780~~ 780.6.

Substantiation:

4.1.1 of the NEC Style Manual states the "reference shall not be made to an entire article unless additional conditions are specified. References to parts within articles shall be permitted."
780.6(A) and (B) both apply to the installation of cables and conductors, not just 780.6(A).

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-162 Log #2934 NEC-P03 **Final Action: Reject**
(725-56(E))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Revise as follows:
(E) Class 2 or Class 3 Cables with Other Circuit Cables. Jacketed cables of Class 2 or Class 3 circuits shall be permitted in the same enclosure, ~~or~~ raceway, or cable tray with jacketed cables of any of the following:
(1) Power-limited fire alarm systems in compliance with Article 760
(2) Nonconductive and conductive optical fiber cables in compliance with Article 770
(3) Communications circuits in compliance with Article 800
(4) Community antenna television and radio distribution systems in compliance with Article 820
(5) Low-power, network-powered broadband communications in compliance with Article 830
(6) ITC cable in compliance with Article 727.

Substantiation:

ITC is only allowed industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation. This would allow all low powered cables to be in the same enclosure, raceway or cable tray. ITC is jacketed cable that adds a level of protection from the other circuits. This will provide a flexibility of alternate installation methods without compromising safety.

Panel Meeting Action: Reject

Panel Statement:

All of the cables and circuits in this section deal with very limited power sources in accordance with Tables 11(A) and (B) but Instrumentation Tray Cable (ITC) cables can carry up to a maximum of 5 amps at 150 volts. The ITC circuit would constitute a power circuit and separation must be maintained between these different systems. Insulation cannot be the sole separation between these circuits.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PACE: The panel statement does not address the submitter's proposed additions of "or cable tray" to 725-56(E). The words "or cable tray" should be added.
I do not agree with the panel statement that "The ITC circuit would constitute a power circuit and separation must be maintained between these different systems". 5 amps at 150 volts (750 VA or so) does not constitute a power circuit, in fact less than some of those allowed (30 volts and less than 1000 VA). The insulation system of the ITC cable is sufficient for safety of personnel and proper operation of the circuits involved. There is no technical reason that ITC should not be allowed to be used in the same raceway as those listed in this section.

3-162a Log #CP305 NEC-P03 **Final Action: Accept**
(725.56(F) New)

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 12 for comment.

Submitter: Code-Making Panel 3

Recommendation:

Add new text:
"725.56(F). Class 2 or Class 3 Conductors or Cables and Audio System Circuits." Audio system circuits described in Section 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with Sections 725.54 and 725.61 shall not be permitted to be installed in the same cable or raceway with Class 2 or Class 3 conductors or cables.

Substantiation:

Alarm systems and remote control circuits for safety control equipment where the failure of the equipment to operate introduces a direct fire or life safety hazard may be affected by these audio system circuits. Depending upon the voltage and amperage of the audio amplifier circuits, a fault between audio amplifier circuits and these Class 2 and Class 3 circuits has the potential to create a serious hazard, by disrupting system operation.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

CASPARRO: Information provided in the Panel's substantiation is incomplete. Discussions held at the Panel meeting on Proposals revealed the need for further technical documentation to address a potential shock hazard, associated with extending the current and voltage limitations of Class II and Class III wiring, that would exist if this proposal were accepted.

3-164 Log #74a NEC-P03 **Final Action: Accept in Principle in Part**
(725-57)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete Section 800.32.
Renumber the reference to 800.32 in 725.57 to 800.80(B).

Substantiation:

This change removes the listing requirement from this section and correlates with moving all listing requirements to a new section. Application requirements are merged into Section 800.30.

Panel Meeting Action: Accept in Principle in Part

Accept the recommendations in the proposal to renumber the reference in 725.57(1) from "800.32" to "800.80(B)" as already incorporated into the draft in Proposal 3-126. Reject the remainder of the proposal.

Panel Statement:

The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-163 Log #73a NEC-P03 **Final Action: Accept in Principle in Part**
(725-57)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete Section 800.31.
Renumber the reference to 800.31 in 725.57 to 800.80(A).

Substantiation:

This change removes the listing requirement and correlates with the proposal to move all listing requirements to a new section.

Panel Meeting Action: Accept in Principle in Part

Accept the recommendations in the proposal to renumber the reference in 725.57(1) from "800.31" to "800.80(A)" as already incorporated into the draft in Proposal 3-126. Reject the remainder of the proposal.

Panel Statement:

The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-165 Log #2742 NEC-P03 (725-58) **Final Action: Reject**

Submitter: Christopher R. Pharo, IBEW-ECAG

Recommendation:

Add the first sentence to amend 725.58 as follows:
725.58 Support of Conductors. Class 2 and Class 3 circuit conductors shall be supported every 1.8 m (6 ft.) and 300 mm (12 in,) from a box or cabinet. Class 2 or Class 3 circuit conductors shall not be strapped, taped or attached by any means to the exterior...

Substantiation:

Wiring installations that are governed by Article 725 are becoming more frequent. There are currently no guidelines for distances between supports of the conductors. The supports can be spaced every 5 ft., 50 ft., or 100 ft. - it doesn't matter because the code doesn't address it. Cabling laying on the ceiling between supports creates problems for future installs as well as for the firefighters who may have to navigate through the spaghetti in the darkness of a fire. The ANSI/TIA/EIA Standard 569 - Commercial Building Standard for Telecommunications Pathways and Spaces requires supports to be installed every 48 in. to 60 in. All other wiring methods in the code have specific guidelines governing distances between supports. Why not here?
The absence of guidelines for distances between supports makes an inspector's job next to impossible. How can he enforce 725.6 Mechanical Execution of Work when the installer can simply put his hands up and say he put in according to code.

Panel Meeting Action: Reject

Panel Statement:

Support requirements for power wiring are based upon the type of wiring method installed. Proper support helps ensure the integrity of the wiring method so that equipment grounding and bonding is maintained and that a complete path for fault current is maintained. There has been no technical substantiation provided in the proposal that safety is compromised by a lack of support distances.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

CASPARRO: The purpose of supporting cables is also to ensure that the cable is not inadvertently damaged during construction. See Panel Action Statement on Proposal 3-32 (Log #182). Current text as written in 725.6 does not contain specific installation requirements necessary to ensure adequate physical protection of cables covered by this article. The submitter of this proposal provides specific installation requirements to ensure that the cable is protected from physical damage during the period of construction. This proposal should be accepted.

3-168 Log #1745 NEC-P03 (725-61) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables.

Class 2, Class 3, and PLTC cables shall comply with any of the requirements described in 725.61(A) through (F) or where cable substitutions are made as shown in 725.61(G) .

(A) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) . Cables installed in ~~ducts,~~ plenums (including ceiling cavity plenums and raised floor plenums)~~, and other spaces used for environmental air~~ shall be listed wires and cables installed in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type CL2P or CL3P. The accessible portion of abandoned Class 2, Class 3, and PLTC ~~Abandoned~~ cables shall not be permitted to remain. ~~Listed wires and cables installed in compliance with 300.22 shall be permitted.~~

(B) Riser. Cables installed in risers shall be as described in any of (1), (2), or (3):

(1) Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type CL2R or CL3R. Floor penetrations requiring Type CL2R or CL3R shall contain only cables suitable for riser or plenum use. The accessible portion of abandoned Class 2, Class 3, and PLTC ~~Abandoned~~ cables shall not be permitted to remain.

(2) Other cables as covered in Table 725.61 and other listed wiring methods as covered in Chapter 3 shall be installed in metal raceways or located in a fireproof shaft having firestops at each floor.

(3) Type CL2, CL3, CL2X, and CL3X cables shall be permitted in one- and two-family dwellings.

FPN: See 300.21 for firestop requirements for floor penetrations.

Substantiation:

[Text of Proposal 3-168 substantiation is shown on page 2091]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application or that only the accessible portion of the cable must be removed.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-170 Log #2624 NEC-P03 (725-61) **Final Action: Accept**

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Change "dwellings" to "dwelling" for editorial consistency with "riser" and "plenum".

Substantiation:

Editorial consistency is good.

Panel Meeting Action: Accept

In Figure 725.61 change the title of the row from "Dwellings" to "Dwelling."

Panel Statement:

NFPA Staff has provided information indicating that the Proposal was addressing Figure 725.61 only.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-171 Log #3289 NEC-P03 (725-61) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise to read as follows:

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables. Class 2, Class 3, and PLTC cables shall comply with any of the requirements described in 725.61(A) through (F).

(A) Plenum. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type CL2P or CL3P. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted. Listed plenum signaling raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Type CL2P or CL3P cable shall be permitted to be installed in these raceways.

(B) Riser. Cables installed in risers shall be as described in any of (1), (2), or (3):

(1) Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type CL2R or CL3R. Floor penetrations requiring Type CL2R or CL3R shall contain only cables suitable for riser or plenum use. Abandoned cables shall not be permitted to remain. Listed riser signaling raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Type CL2R, CL3R, CL2P, or CL3P cables shall be permitted to be installed in these raceways.

(2) Other cables as covered in Table 725.61 and other listed wiring methods as covered in Chapter 3 shall be installed in metal raceways, or located in a fireproof shaft having firestops at each floor.

(3) Type CL2, CL3, CL2X, and CL3X cables shall be permitted in one- and two-family dwellings. Listed general purpose signaling raceways shall be permitted to be with CL2, CL3, CL2X and CL3X cables.

FPN: See 300.21 for firestop requirements for floor penetrations.

(C) Cable Trays. Cables installed in cable trays outdoors shall be Type PLTC. Cables installed in cable trays indoors shall be Types PLTC, CL3P, CL3R, CL3, CL2P, CL2R, and CL2. Listed signaling raceways shall be premitted for use with cable trays when the raceway is used with the approperate cable.

FPN: See 800.52(D) for cables permitted in cable trays.

(D) Hazardous (Classified) Locations. Cables installed in hazardous locations shall be as described in 725.61(D)(1) through (D)(4).

(1) Type PLTC. Cables installed in hazardous (classified) locations shall be Type PLTC. Where the use of Type PLTC cable is permitted by 501.4(B), 502.4(B), and 504.20, the cable shall be installed in cable trays, in raceways supported by messenger wire, or otherwise adequately supported and mechanically protected by angles, struts, channels, or other mechanical means. The cable shall be permitted to be directly buried where the cable is listed for this use.

(2) Nonincendive Field Wiring. Wiring for Class 2 circuits as permitted by 501.4(B)(3) shall be permitted.

(3) Thermocouple Circuits. Conductors in Type PLTC cables used for Class 2 thermocouple circuits shall be permitted to be any of the materials used for thermocouple extension wire.

(4) In Industrial Establishments. In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage, Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted as open wiring between cable tray and utilization equipment in lengths not to exceed 15 m (50 ft). The cable shall be supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.75 m (6 ft).

(E) Other Wiring Within Buildings. Cables installed in building locations other than those covered in 725.61(A) through (D) shall be as described in any of (1) through (7) (~~6~~). Abandoned cables in hollow spaces shall not be permitted to remain.

(1) Type CL2 or CL3 shall be permitted.

(2) Type CL2X or CL3X shall be permitted to be installed in a raceway or in accordance with other wiring methods covered in Chapter 3.

(3) Cables shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).

(4) Listed Type CL2X cables less than 6 mm (0.25 in.) in diameter and listed Type CL3X cables less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in one- and two-family dwellings.

(5) Listed Type CL2X cables less than 6 mm (0.25 in.) in diameter and listed Type CL3X cables less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in nonconcealed spaces in multifamily dwellings.

(6) Type CMUC undercarpet communications wires and cables shall be permitted to be installed under carpet.

(7) Listed signaling raceways shall be premitted when used with CL2 or CL3 cables.

(F) Cross-Connect Arrays. Type CL2 or CL3 conductors or cables shall be used for cross-connect arrays.

(G) Class 2 and Class 3 Cable Uses and Permitted Substitutions. The uses and permitted substitutions for Class 2 and Class 3 cables listed in Table 725.61 shall be considered suitable for the purpose and shall be permitted.

FPN: For information on Types CMP, CMR, CH, and CMX cables, see 800.51.

Substantiation:

This is the second of three companion proposals to add Nonmetallic Signaling Raceways to Article 725. The same listed raceways are currently found in Articles 770 and 800 for Optical Fiber and Communication Cables. These raceways are commonly being used for the removal of abandon cables and are ideal for signaling cables that are listed for the purpose.

Panel Meeting Action: Accept in Principle

[Text of Proposal 3-171 panel action is shown on page 2106]

Panel Statement:

The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format. The panel has added Types CL2D and CL3D to the appropriate subsections within this Proposal to be consistent with previous actions on other Proposals. The phrase " when the raceway is used with the appropriate cable" was deleted since this is already a requirement where used in plenums, risers, and general purpose locations. The proposed permission to install listed plenum signaling raceways in ducts and plenums has been rejected since these raceways and cables are not permitted to be

installed in Section 300.22(B) in the NEC.

The remaining changes are editorial in nature and provide consistency throughout the Section.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

CASPARRO: This proposal is not within the scope of Panel 3 and should be referred to Panel 8 who has jurisdiction over raceway. 725.61 lists applications for cables and does not apply to raceway installations. Acceptance of this Proposal by Panel 3 would permit this raceway to be installed without any support requirements. Consideration also needs to be given where this raceway is installed in cable trays in close proximity to power and lighting conductors and non-power limited Class I wiring.

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

3-166 Log #469 NEC-P03 **Final Action: Reject**

(725-61, 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Stanley Kaufman, OFS

Recommendation:

Delete "Plenum" and replace it with "Ceiling Cavity and Raised Floor Plenum".

Substantiation:

The NFPA Technical Committee on Air-Conditioning has proposed changing the titles of sections 725.61(A), 760.61(A), 770.53(A), 800.53(A) and 820.53(A) from "Plenum" to "Ceiling cavity plenums and raised floor plenums" in order to correlate with NFPA 90A. The term "plenum" in these figures also needs to be changed to reflect the requirement that "plenum" cables, Types CL2P, CL3P, FPLP, OFNP, OFCP, CMP and CATVP are suitable for use in ceiling cavity and raised floor plenums, but not in other plenums, for example, air-handling unit plenums.

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the term "plenum" should be changed to "ceiling cavity and raised floor plenum"

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

KUMANDAN: See my Explanation of Negative on Proposal 3-132.

3-172 Log #1659 NEC-P03 **Final Action: Reject**
(Table 725-61, 760.61, Table 760.61)

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to Types OFNG, OFCG, and CMG in the Code. Specifically delete:

645.5(5)(c) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM and MP (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R ~~or G.~~ Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

Table 725.61 Delete CMG.

760.61(D) FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, ~~CMG~~, CM), see 800.51.

Table 760.61 Delete CMG.

Table 770.50 Delete the rows for OFNG and OFCG cables.

~~770.51(C) Types OFNG and OFCG. Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.~~

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

770.53(B)(2) Types ~~OFNG~~, OFN, ~~OFCG~~, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

770.53(B)(3) Types ~~OFNG~~, OFN, ~~OFCG,~~ and OFC cables shall be permitted in one- and two- family dwellings.

770.53(C) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 770.53(A) and (B) shall be Type ~~OFNG~~, OFN, ~~OFCG~~, or OFC. Such cables shall be permitted to be installed in listed general-purpose optical fiber raceways.

Table 770.53 Delete OFNG and OFCG.

Table 800.50 Delete the row for CMG.

800.51~~(C) Type CMG. Type CMG general-purpose communications cable shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.~~

800.52(D) Cable Trays. Types MPP, MPR, ~~MPG~~, and MP multipurpose cables and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be permitted to be installed in cable trays. Communications raceways, as described in 800.51, shall be permitted to be installed in cable trays.

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

800.53(C) Distributing Frames and Cross-Connect Arrays. Listed communications wire and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be used in distributing frames and cross-connect arrays.

800.53(D) Cable Trays. Types MPP, MPR, ~~MPG~~, and MP multipurpose cables and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be permitted to be installed in cable trays.

800.53(E)(1) General. Cables shall be Type ~~CMG or~~ Type CM. Listed communications general-purpose raceways shall be permitted. Only Types ~~CMG~~, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.

800.53(G) FPN: For information on Types CMP, CMR, ~~CMG~~, CM, and CMX cables, see 800.51.

Table 800.53 Delete CMG.

Table 820.53 Delete CMG.

Table 830.58 Delete CMG.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

There are no requirements or specifications for the use of general-purpose "G" cables (OFNG, OFCG, CMG, MPG) versus the communications cables already specified. Consequently CMP 16 is obliged to follow the TCC directive and accept this proposal.

We believe that general-purpose "G" cables should be permitted to continue to be in the NEC. We recommend that the Code panel accept this proposal with a request to the TCC that it reconsider its position on inclusion of products that do not have specific application rules in the NEC. These cables were established because of an effort to harmonize the NEC and the Canadian Electrical Code. Richard Biermann, the TCC chairman, and Roy Hicks, the CEC head, submitted the proposals. A copy of one of their proposals is attached for reference. It's a shame that the current position of the TCC requires the removal of "G" cables from the Code.

General-purpose "G" cables could be retained if the TCC would change its position as follows:

The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC unless inclusion in the NEC is for purposes of correlating with other codes.

Panel Meeting Action: Reject

Panel Statement:

The applications for the use of these cables are found in both Articles 770 and 800 so these references to the "G" cables can remain based on the TCC determination. See these application references in 770.53 for optical fiber cable and in Section 800.53 for communications cables.

communications cables.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-167 Log #1341 NEC-P03 **Final Action: Accept**
(725-61 and 760.61)

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

In Tables 725.61 and 760.61 delete the columns headed "Use" and "References".

Revise 725.61(G) as shown below:

(G) Class 2 and Class 3 Cable ~~Uses and Permitted~~ Substitutions. The ~~uses and permitted~~ substitutions for Class 2 and Class 3 cables listed in Table 725.61 ~~shall be considered suitable for the purpose and~~ shall be permitted.

FPN: For information on Types CMP, CMR, CH, and CMX cables, see 800.51.

Revise 760.61(D) as shown below:

(D) Fire Alarm Cable ~~Uses and Permitted~~ Substitutions. The ~~uses and permitted~~ substitutions for fire alarm cables listed in Table 760.61 shall be ~~considered suitable for the purpose and shall be~~ permitted.

FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, CMG, CM), see 800.51.

Substantiation:

As shown below, Article 770 deals with cable substitutions simply.

(F) Cable Substitutions. The substitutions for optical fiber cables listed in Table 770.53 shall be permitted.

Table 770.53 Cable Substitutions

Cable Type	Permitted Substitutions
OFNP	None
OFCP	OFNP
OFNR	OFNP
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN

Article 830 also treats cable substitutions simply. See 830.58(E).

The parallel sections in Articles 725, 760, 800 and 820 mix cable use in with cable substitutions. This is not necessary because these Articles already deal with cable use in other sections. This proposal, if accepted, will revise Articles 725, 760, 800 and 820 to be editorially consistent with Articles 770 and 830.

Keep it simple!

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

Panel Meeting Action: Accept

Panel Statement:

The supporting information material included with this Proposal was inadvertently included with this Proposal and does not apply to any aspect of this proposed change since it is dealing with high hazard contents within a building and the various NFPA Committees addressing those applications, such as NFPA 30, 54, and 58, all dealing with hazardous combustible liquids or gases.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-169 Log #2554 NEC-P03 **Final Action: Accept in Principle**
(725-61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 725.61(A), Table 725.61, and Figure 725.61 as shown below. Sections 725.61(B) through (G) do not change.

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables. Class 2, Class 3, and PLTC cables shall comply with the requirements described in 725.61(A) through (F).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CL2D or Type CL3D and shall be associated with the air duct system. Listed conductors and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CL2D or Type CL3D and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CL2D or Type CL3D cable shall be mechanically protected to a height of 7 feet above the floor. Listed conductors and cables installed in compliance with Section 300.22 shall be permitted.

(b) ~~(A) Plenum.~~ Cables installed in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type CL2D, CL3D, CL2P or CL3P. Abandoned cables shall not be permitted to remain. Listed conductors ~~wires~~ and cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

Revise Table 725.61 as shown below:

INSERT Table 725.61 HERE

(Table shown on page 2711)

Revise Figure 725.61 Cable Substitution Hierarchy as shown:

INSERT Figure 725.61 HERE

Substantiation:

[Text of Proposal 3-169 substantiation is shown on page 2103]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: This proposal should be rejected. Acceptance of this proposal in principal as referenced to Proposal 3-192 (Log #1222), and Proposal 3-213 (Log #443) in the panel statement does not provide a specific application for this cable type. The NEC is not a product catalog nor is it a design manual and is not intended to contain an all-inclusive list of permitted products. It should also be noted that in the referenced Proposal 3-192 (Log # 1222) the panel statement is not consistent with the panel action taken in the MS Word include file (Proposal 192 Action and Statement). The title "Ceiling Cavity Plenum" and "Raised Floor Plenum" was deleted from 725.61(A) and was not referenced in the panel statement. Also the submitter did not provide adequate substantiation why the use of Plenum rated cable should be limited in application and the phrase "ceiling cavity plenum" and "raised floor plenum" are not recognized in the NEC.

EASTER: NFPA 90A and the NEC contain no requirements for the use of "Duct" rated cables, UL currently permits cables to be marked with a limited combustible marking, the NFPA TCC rejected the same proposals for the 2002 NEC, and the NFPA Standards Council upheld the TCC rejection citing that correlation considerations did not require the classification to be recognized by the NEC.

1. Substantiation from the NFPA 90A Technical Committee on Air Conditioning for Proposal 3-94 states: "The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums."
2. The NEC contains no requirements for the use of "Duct" cables.
3. UL Product Standards for cables for use in accordance with article 725 and 760, (UL-13, UL-1424, and UL-1425) permit the cables to be optionally marked to indicate a limited combustible classification.

The following is from the NFPA Standards Council Decision D#01-20 that was distributed at the Panel meeting.

4. During the 2002 NEC cycle the NFPA Technical Correlating Committee rejected the same proposals citing that "...it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required, by the NEC."

5. The NFPA Standards Council upheld the Technical Correlating Committee position stating "The council questions whether any correlation issue between the NEC and NFPA 90A exists that would require the NEC to recognize the proposed limited combustible cable classification."

6. The Standards Council further stated "...NFPA 90A does not, as the council understands it require the use of cable with a limited combustible marking. Even if it did, it does not follow that correlation considerations require the classification to be recognized by the NEC.

Proposals to add a limited combustible classification "D" suffix to cable types should be rejected.

KEDEN: For the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle. There are no requirements or specifications in 300.22 for the use of duct cables, cables ending in "D", (e.g., ECD, CL2D, CL3D) versus cables already specified. The CMP-3 has not approved any application that only duct cable can meet.

Comment on Affirmative:

AYER: I agree with the concept of allowing the use of a limited combustible cable. If you read the code closely there is no application at the present time for a listed cable, which can be installed in Ducts or plenums as specified in 300.22(B). By revising the text as follows the duct cable can satisfy the requirements of 300.22(B) while keeping 300.22(C) unchanged. In addition, there is no need to list Type CL2D and CL3D cables in the sections for "Other spaces used for environmental air" or "Risers" since this is permitted through the substitution chart. I propose the text to read as follows:

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables.

Class 2, Class 3, and PLTC cables shall comply with any of the requirements described in 725.61(A) through (G) ~~(F)~~.

(A) ~~(A)~~ Ducts and Plenums. ~~Plenum.~~ Cables installed in ducts and plenums shall be Type CL2D or Type CL3D and shall be associated with the duct system. Listed conductors and cables installed in compliance with Section 300.22(B) shall be permitted.

(B) Other spaces used for environmental air. Cables installed in ~~ducts, plenums, and~~ other spaces used for environmental air shall be Type CL2P or CL3P. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22(C) shall be permitted.

EGESDAL: The Panel should reconsider its action on the rejected portion of the Proposal in order to: restrict installation of plenum cable to ceiling cavity plenums and raised floor plenums and prohibit installation of unrestricted quantities of plenum cable throughout the air distribution system. Accepting this proposed change will correlate the NEC with NFPA 90A-2002 requirements. The Panel should accept installation of the proposed duct cable in the air distribution system where associated with the air distribution. Also, see comment on Proposal 3-213.

The Panel overlooked the substantiation in the proposal for protecting cables in an air-handling room plenum to 7' above the floor. The substantiation in the proposal is from interviews with experienced HVAC installers and service technicians, who provide protection of cable to 7' above the floor of air-handling room plenums as being necessary. Providing protection for cables to 7' above the floor mirrors the requirements for fire alarm cable. NPFA 90A requires air inlets below 7' to be protected, so a similar requirement for cable makes sense. [NFPA 90A-2002, "4.3.4.3.4 Service openings shall not be required where all the following conditions exist:

(2) The air inlets are at least 2.13 m (7 ft) above the floor or are protected by corrosion-resistant metal screens of at least 14 mesh (0.07 in.)...".

Note: The following is for information only on "duct cable" proposals:

Panels 3 and 16 received numerous proposals to establish listings and use requirements for a new type of cable having superior fire safety characteristics exceeding those of plenum cable. These cables are referred to as "limited fire hazard duct cable" in some of the proposals and "duct cable" in the others. Action by Panel 16 changed the name to "air duct" cable. Panel 3 accepted the name "duct cable." Considering the volume and complexity of the proposals, the following table is a guide to the proposals to provide users of the ROP the relationships between the proposals. The "Primary Application" column shows the primary application proposed for the cable. Because of cable substitutions, other applications would also be permitted. The term "other plenums" in the primary application column is shorthand for "plenums, other than ceiling cavity and raised floor plenums". Many of the proposals, propose multiple actions, some of which are also proposed in simpler one and two-action proposals. The "Incorporates changes from other proposals" column shows those related proposals that are a foundation that the more comprehensive proposals build upon.

Insert Table Here

(Table shown on page 2711)

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-175 Log #873 NEC-P03 (725-61(A)) **Final Action: Reject**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 725.61 (A), second sentence, as follows:

The accessible portion of ~~A~~abandoned cables shall not be permitted to remain.

Substantiation:

Correlates with 820.3 (A) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 820.53 (B) (1), 820.53 (D), 830.55 (B), 830.55 (C) (1) and 725.61 (B) (1).

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 3-173.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-174 Log #441 NEC-P03 **Final Action: Reject**
(725-61(A), 760.30(B)(2), 760.61(A))

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise sections 725.61(A), 760.30(B)(2), and 760.61(A) as follows:

725.61(A) Ceiling cavity plenums and raised floor plenums ~~Plenum~~. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type CL2P or CL3P. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted.

760.30(B)(2) Ceiling cavity plenums and raised floor plenums. ~~Other Spaces Used for Environmental Air~~. Cables installed in ceiling cavity plenums and raised floor plenums ~~other spaces used for environmental air~~ shall be Type NPLFP.

Exception No. 1: Types NPLFP, NPLFR and NPLF cables installed in compliance with 300.22(C).

Exception No. 2: Other wiring methods in accordance with 300.22(C) and conductors in compliance with 760.27(C).

760.61(A) Ceiling cavity plenums and raised floor plenums ~~Plenum~~. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental~~ air shall be Type FPLP. Abandoned cables shall not be permitted to remain. Types FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. The permission to use plenum cables in air ducts and plenums, other than ceiling cavity and raised floor plenums is proposed to be deleted to correlate with NFPA 90A.

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

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

EGESDAL: See my Explanation of Negative on Proposal 3-213 (Log #443).

KUMANDAN: See my Explanation of Negative on Proposal 3-132.

3-173 Log #190 NEC-P03 **Final Action: Accept in Principle**
(725-61(A), 760.61(A))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc.

Recommendation:

Delete the sentence: "Abandoned cables shall not be permitted to remain."

Substantiation:

The proposal corrects errors in the 2002 NEC. The panel intent was to require the removal of the accessible portions of cables only and that requirement is in sections 725.3(B), 760.3(A), 770.3(A), 800.52(B), 820.3(A) and 830.3(A). The error arose when CMP-16 accepted Comments 16-64 and 16-87 for the 2002 NEC in addition to other actions. These Comments converted numerous exceptions into positive language. In preparing the Comments, I used language from the 1999 NEC and did not incorporate the accepted Proposals and other Comments for the 2002 NEC.

Panel Meeting Action: Accept in Principle

Accept the deletion of the sentence "abandoned cables shall not be permitted to remain" in the following four locations: 725.61(A), 725.61(B)(1), 760.61(A) and 760.61(B)(1).

Panel Statement:

The panel has accepted the deletion of the phrase in a total of four locations with the understanding that Section 725.3(B) and 760.3(A) will provide the necessary text to resolve this problem. Section 725.3(B) covers Part III of Article 725 and Section 760.3(A) covers all of Article 760.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

CASPARRO: This proposal should be rejected. The requirement that "abandoned cables shall not be permitted to remain" in the four locations described in the Panel Statement should remain in the revised text that was accepted in Proposal 3-131 (Log #467). The panel action to remove this requirement does not address the submitter's concern as outlined in his substantiation but rather eliminates this important safety requirement from sections where it is most applicable.

3-176 Log #874 NEC-P03 **Final Action: Reject**
(725-61(B)(1))

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 725.61 (B) (1), last sentence, as follows:
The accessible portion of ~~A~~abandoned cables shall not be permitted to remain.

Substantiation:

Correlates with 820.3 (A) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 820.53 (B) (1), 820.53 (D), 830.55 (B), 830.55 (C) (1) and 725.61 (A).

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 3-173.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-177 Log #68 NEC-P03 (725-61(C)) **Final Action: Accept in Principle in Part**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber sections 770.52; 800.52; 820.52 and 830.58 to be 770.55; 800.55; 820.55 and 830.55, respectively.
Renumber the reference to 800.52(D) in 725.61(C) to 800.55(D).
In the first sentence of 800.52 (new 800.55), change "800.52(A)" to "800.55(A)".
In the first sentence of 830.58 (new 830.55), change "830.58(A)" to "830.55(A)".
In 830.58(C) (new 830.55(C)), change "Table 830.58" to "Table 830.55" three times.

Substantiation:

This change lines up Section 725.55 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium Power Network-Powered Broadband Communications Cables, Section 760.55 Separation from Electric Light, Power, Class 1, NPLFA, and Medium Power Network-Powered Broadband Communications Circuit Conductors, Section 770.52 Installation of Optical Fibers and Electrical Conductors, Section 800.52 Installation of Communications Wires, cables, and Equipment, Section 820.52 Installation of Cables and Equipment and Section 830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods. These sections apply to similar requirements. With this change, all these sections will have the section number xxx.55.

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept in Principle in Part

Accept the recommendations in the proposal to renumber the reference in 725.61(C), FPN from "800.52(D)" to "800.55(D)" as already incorporated into the draft in Proposal 3-126. Reject the remainder of the proposal.

Panel Statement:

The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-178 Log #1006 NEC-P03 (725-61(D)(1)) **Final Action: Accept**

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Insert a comma between "raceways" and "supported by messenger wire."

Substantiation:

In the 1999 NEC, "in raceways" was one permitted use of Type PLTC in hazardous areas and "supported by messenger wire" was another. This was changed for some reason to "in raceways supported by messenger wire." This has not been listed in the errata for the 2002 NEC although it has been noted to NFPA staff. Although it does not really make any sense as printed, someone might think there really is some reason to support a raceway by a messenger wire.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-179 Log #1007 NEC-P03 **Final Action: Accept**
(725-61(D)(2))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise this section to read:
(3) Intrinsically Safe Circuits and Nonincendive Field Wiring. Wiring for nonincendive circuits as permitted by 501.4(B)(3) and wiring for intrinsically safe circuits as permitted by 504.20 shall be permitted for circuits derived from Class 2 sources.

Substantiation:

Sections 504.20 and 501.4(B)(3) allow the use of any wiring methods "suitable for unclassified areas" or "permitted for unclassified areas." If a nonincendive or intrinsically safe circuit does not also comply with the requirements for a Class 2 power source, then Class 2 wiring methods are not methods that would be "permitted" or "suitable" for unclassified areas. As presently worded, Section 725.61(D) apparently only permits type PLTC for intrinsically safe circuits even though these circuits are more reliably power-limited than nonincendive circuits. The power limitations are essentially the same for either type of circuit in an area classified due to some given "hazardous" material. As has been noted in previous panel comments, not all Class 2 circuits are nonincendive for all atmospheres, and not all nonincendive circuits are Class 2. The same may be said of intrinsically safe circuits. This proposal will help clarify that Class 2 wiring methods, including but not limited to Type PLTC cable, may be used for Class 2 circuits that are also intrinsically safe or nonincendive. The requirements for Class 2 sources are already covered in 725.41, and the definitions and requirements for nonincendive and intrinsically safe circuits are covered in 500.2 and 504.2, respectively. Type PLTC cable is permitted and required for Class 2 circuits in Division 2 areas if the circuits are incendive according to 501.4(B) and 725.61(D). Other methods are required in Division 1 areas if the circuits are not intrinsically safe according to 501.4(A). (The references in 725.61(D) only refers to Division 2 and intrinsically safe.) Although this proposal does not spell this all out in detail, taken with the other noted references, it does provide a basis for correct interpretation and application. (Sorry, the online submission process does not seem to allow more than one paragraph.)

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

3-180 Log #118 NEC-P03 **Final Action: Reject**
(725-61(D)(4))

Submitter: James M. Daly, General Cable

Recommendation:

Revise as follows:

(4) In Industrial Establishments. In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage, Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted to be exposed ~~as open wiring~~ between the cable tray and utilization equipment or device ~~in lengths not to exceed 15 M (50 ft)~~. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be ~~supported and~~ secured at intervals not exceeding 1.8 ~~1.75~~ m (6 ft).

Substantiation:

This revision will make the installation requirements for PLTC cable similar to those specified in 336.10(6) for Type TC cable.

Code-Making Panel 7 agreed to remove the 15 m (50 ft) length limitation in exchange for having the cable continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channels. If "continuously supported" is used in the second sentence, then "supported and" is not necessary in the third sentence.

1.8 m is the recommended SI conversion for 6 ft in Annex C of the NEC Style Manual, unless the Code Panel feels that the extra precision is needed for safety.

The term "open wiring" has caused confusion ever since it was first introduced, so that term was deleted from TC cable in the 2002 Code. Underwriters Laboratories agreed to define a substitute identifer. The same substitute identifer could be used for PLTC cable.

This is one of a series of proposals to provide consistency throughout the code in the use of the terms "exposed", "open wiring", and "open runs" as applied to wiring methods.

"Exposed" is used 306 times throughout the code, "open runs" is used 7 times, and "open wiring" is used 29 times but only 10 of those instances do not refer to "open wiring on insulators".

Exposed is defined in Article 100 as shown below.

"Exposed (as applied to live parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts that are not suitably guarded, isolated or insulated."

"Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access."

Open wiring on insulators is defined in 398.2 as "An exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings."

"Open runs" is not defined in the code.

This series of proposals will limit the term "open wiring" to open wiring on insulators (Article 398) and have the term "exposed" apply to "open runs" and open wiring not on insulators.

Wire and cable that must be continuously supported and protected will be specifically addressed in the applicable section.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided information on the use of the phrase "open wiring" in many different locations throughout the Code, but has given no technical substantiation for removing it here. Deleting the maximum length of 50 feet between the cable tray and the equipment does not have adequate technical substantiation. Cable must be supported in accordance with 725.6.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PACE: The reason for removing the term "open wiring" is that 1) it is undefined (as opposed to the term "open wiring on insulators" that is defined) and 2) the words "open wiring" therefore mean different things to different people. This causes confusion, such as often being understood to be un-insulated. The attempt here is to use the term "exposed" rather than "open wiring" which is better understood in the field. This change should have been accepted by the panel. The change from "open" to "exposed" was accepted by this panel through its actions and panel statements on Proposals 3-218, 3-220, 3-221, and 3-222. The same logic, reasoning, and substantiation apply here as well.

The submitter's addition of the words "or device" was not addressed by the panel action. These words do not add or restrict, rather they should be added to better clarify the requirement.

The deletion of the 50 foot maximum distance requirement is justified in that the balance of the proposal adds the requirement that the cable be "continuously" supported and secured at intervals not exceeding 6 feet. If the cable is continuously supported and secured not exceeding 6 feet, there is no technical reason to limit the distance. If types PLTC and TC cables meet the same crush and impact requirements, and are identified for use in "open" (exposed) wiring, then both should perform the same when subjected to identical conditions in the field. Type TC designs have no length restrictions between the cable tray and the utilization equipment.

3-181 Log #451 NEC-P03 **Final Action: Reject**
(725-61(D)(4))

Submitter: Anthony P. Gabriel, Alpha Wire Company

Recommendation:

Revise text as follows:
In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage. Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted as open wiring between cable tray and utilization equipment ~~in lengths not to exceed 15 m (50 ft)~~. The cable shall be supported against physical damage using mechanical protection such as dedicated struts, angles or channels. The cable shall be supported and secured at intervals not exceeding ~~1.75~~ 1.8 (6 ft).

Substantiation:

Type TC cables and Type PLTC cables are tested for compliance to open Wiring requirements under identical test conditions yet the PLTC designs are limited to a 50 ft. distance between the cable tray and the utilization equipment while the TC designs have no length restrictions.
If both types of cable meet the open wiring test requirements, then both types of cable should be subject to identical conditions of installation.
The metricated length limitation of the support distance was amended to be consistent at one decimal place.

Panel Meeting Action: Reject

Panel Statement:

Deleting the maximum length of 50 feet between the cable tray and the equipment does not have adequate technical substantiation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PACE: See my Explanation of Negative for 3-180 (Log #118).

3-182 Log #902 NEC-P03 **Final Action: Reject**
(725-61(D)(4))

Submitter: Gerald Dorna, Belden Wire & Cable

Recommendation:

Eliminate the wording "in lengths not to exceed 15 m (50 ft)" in the following clause:
725.61(D)(4) In Industrial Establishments. In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage. Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted as open wiring between cable tray and utilization equipment in lengths not to exceed 15 m (50 ft). The cable shall be supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.75 m (6 ft).
Eliminate in the above: "in lengths not to exceed 15 m (50 ft)".

Substantiation:

If the cable type PLTC meets the same requirements with respect to crush and impact as MC for "Open Wiring" then there should be no length limitation. This will also make this requirement correspondent with type TC cable which also has no length limitation for "Open Wiring" see 336.10(6).

Panel Meeting Action: Reject

Panel Statement:

See the panel statement from Proposal 3-181.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PACE: See my Explanation of Negative for 3-180 (Log #118).

3-183 Log #2932 NEC-P03 **Final Action: Reject**
(725-61(D)(4))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Revise as follows:

(4) In Industrial Establishments. In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, ~~and where the cable is not subject to physical damage,~~ Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted to be run not installed within a raceway or cable tray system ~~as open wiring~~ between cable tray and utilization equipment in lengths not to exceed 15 m (50 ft). The cable shall be supported and secured at intervals not exceeding 1.75 m (6 ft) and be protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. ~~The cable shall be supported and secured at intervals not exceeding 1.75 m (6 ft).~~

Substantiation:

The phrase "open wiring" appears more than 30 times in the current 2002 NEC, but it exists in two distinct formats: a) as the defined term "open wiring on insulators" by Article 398.2, or b) simply as the undefined term "open wiring'. With the defined term, open wiring makes reasonable sense. However when used as the undefined term "open wiring", especially when used to describe a cable that is required to have mechanical integrity and protection takes on an entirely different meaning. Clearly such an installation is not "open". Due to the significant difference in the use of the terms, this and associated other proposals if accepted would replace the undefined use of the term "open wiring" with more appropriate language that addresses the installation in 501.4(B)(1)(5), 501.5 Exception No. 2; 503.3(B); 504.30(A)(1); 505.15(C)(1)(c); 505.16(C)(1) Exception No. 2; 610.12(A); 725.61(D)(4); and 727.4(4)(5)(6), and use the full 398.2 defined term where the text suggests as in 300.16(A); 312.5(B); 314.17(B); 314.17(C). Again, individual proposals have been submitted to address each section mentioned. Since the concept of open wiring may also have permitted messenger supported wiring, with this change, this term has been added.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided information on the use of the phrase "open wiring", but has given no technical substantiation for removing it here. Cable must be supported in accordance with 725.6. The submitter has not provided any technical substantiation for removing the phrase "and where the cable is not subject to physical damage".

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PACE: See my Explanation of Negative for 3-180 (Log #118).

3-184 Log #3469 NEC-P03 **Final Action: Reject**
(725-61(D)(4))

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

Recommendation:

Delete the section in its entirety.

Substantiation:

The National Electrical Code is prescriptive code. To say "where the conditions of maintenance and supervision ensure that only qualified persons service the installation," is a performance requirement. Without prescriptive requirements indicating whether this qualified person is an employee of the owner of the premises or is a separately contracted person and the Authority Having Jurisdiction has a means of verification of the continued employment of the qualified person and whether the qualified person has been verified by the authority having jurisdiction as meeting the definition of a qualified person as shown in the definitions of this Code no prescriptive requirements have been followed.

To permit relaxation of the safety requirements of this Code without establishing a positive guarantee that the safety of persons and property is indisputably assured is a reprehensible act.

Panel Meeting Action: Reject

Panel Statement:

The definition of term "qualified person" has been changed in the 2002 NEC to more accurately reflect who is considered to be a qualified person in the NEC. That definition is as follows: "One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved." It should not matter if the qualified person is a contract person or is employed by the owner of the facility.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-185 Log #464 NEC-P03 **Final Action: Reject**
(725-61(E)(1), 760.61(C) (1))

Submitter: Stanley Kaufman, OFS

Recommendation:

Add the word "exposed" as shown:
800.53(E)(1) General. Exposed ~~Cables~~ cables shall be Type CMG or Type CM. Listed communications general-purpose raceways shall be permitted. Only Types CMG, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.
820.53(D)(1) General. Exposed Type CATV shall be permitted.
830.55(D)(1) General. Exposed Type BLP or BM shall be permitted.
770.53(C) Other Wiring Within Buildings. Exposed ~~Cables~~ cables installed in building locations other than the locations covered in 770.53(A) and (B) shall be Type OFNG, OFN, OFCG, or OFC. Such cables shall be permitted to be installed in listed general-purpose optical fiber raceways.
760.61(C)(1) Exposed Type FPL shall be permitted.
725.61(E)(1) Exposed Type CL2 or CL3 shall be permitted.

Substantiation:

Editorial clarification inspired by a question from an installer.

Panel Meeting Action: Reject

Panel Statement:

There is no technical substantiation provided in the proposal to justify adding the word "exposed." Any of these cables can be installed exposed or concealed as other wiring within buildings. Accepting this proposal would require Class 2 cables to thermostats, door bells, and other similar applications to be run exposed, rather than concealed in walls and ceilings of regular construction.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-186 Log #882 NEC-P03 **Final Action: Accept in Principle**
(725-61(E)(7))

Submitter: James M. Daly, General Cable

Recommendation:

Add the following new section to 725.61(E):
(7) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage, Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted to be exposed between the cable tray and the utilization equipment or device. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft).

Substantiation:

725.61(D)(4) permits this type of installation in hazardous locations. There is no provision for a similar type of installation in nonhazardous locations. This added text will correct this inconsistency. If this type of installation is safe in hazardous locations, it certainly should be safe in nonhazardous locations under the same installation requirements.
Also, 336.10(6) currently permits the installation of 600 V Type TC cable under the same conditions.
1.8 m is the recommended SI conversion for 6 ft in Annex C of the NEC Style Manual unless the Code Panel feels that extra precision is needed for safety.

Panel Meeting Action: Accept in Principle

Add the following new (7) to existing 725.61(E) to immediately follow existing (6):
(7) In Industrial Establishments. In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is not subject to physical damage, Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted as open wiring between cable tray and utilization equipment in lengths not to exceed 15 m (50 ft). The cable shall be supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.75 m (6 ft).
Change (6) to (7) in 725.61(E) as follows:
"(E) Other Wiring Within Buildings. Cables installed in building locations other than those covered in 725.61(A) through (D) shall be as described in any of (1) through (7). Abandoned cables in hollow spaces shall not be permitted to remain."

Panel Statement:

The proposed action was accepted in principle to add the text into 725.61(E)(7) that was used in 725.61(D)(4).
The submitter has given no technical substantiation for removing the phrase "open wiring" here. Deleting the maximum length of 50 feet between the cable tray and the equipment does not have adequate technical substantiation. Cable must be supported in accordance with 725.6.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 10 Negative: 2

Explanation of Negative:

CASPARRO: This proposal should be rejected. The submitter has given no technical substantiation to support this change. The scope of 725.61(E) is too broad to permit this exception of the general rule without due consideration given to the physical protection of this cable type as it applies to specific installations covered in this section.
PACE: See my Explanation of Negative for 3-180 (Log #118).

3-187 Log #2632 NEC-P03 (725-61(G)) **Final Action: Accept in Principle**

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise 725.61(G) as shown below:

(G) Class 2 and Class 3 Cable Uses and Permitted Substitutions. The uses and permitted substitutions for Class 2 and Class 3 cables listed in Table 725.61 shall be considered suitable for the purpose and shall be permitted. Where substitute cables from Article 800 are used, the wiring rules of this article shall apply.

FPN: For information on Types CMP, CMR, CH, and CMX cables, see 800.51.

Substantiation:

This clarification is needed because some code users believe that when they use a substitute cable from Article 800, that Article 800 requirements apply.

Panel Meeting Action: Accept in Principle

Change submitters proposed text to: "Where substitute cables are installed, the wiring requirements of Article 725, Parts I and III shall apply."

Panel Statement:

The text was modified to make it clear that where substitute cables are installed the wiring requirements of Parts I and III of Article 725 will apply, which addresses the submitter's intent.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-188 Log #77 NEC-P03 **Final Action: Accept in Principle in Part**
(725-61(G), FPN)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete 800.51 Listing Requirements for Communications Wires and Cables and Communications Raceways.
Change the reference to 800.51 in 725.61(G) FPN to 800.82.
Change the reference to 800.51 in 760.61(D) to 800.82.
Create a new section VI "Listing Requirements":
VI. Listing Requirements.
800.80 Equipment. Communications equipment shall be listed as suitable for electrical connection to a telecommunications network.
FPN: One way to determine applicable requirements is to refer to UL 1950-1993, Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment, third edition; UL 1459-1995, Standard for Safety, Telephone Equipment, third edition; or UL 1863-1995, Standard for Safety, Communications Circuit Accessories, second edition. For information on listing requirements for communications raceways, see UL 2024-1995, Standard for Optical Fiber Raceways.
(A) Primary Protectors. The primary protector shall consist of an arrester connected between each line conductor and ground in an appropriate mounting. Primary protector terminals shall be marked to indicate line and ground as applicable.
FPN: One way to determine applicable requirements for a listed primary protector is to refer to ANSI/UL 497-1995, Standard for Protectors for Paired Conductor Communications Circuits.
(B) Secondary Protectors. The secondary protector shall be listed as suitable to provide means to safely limit currents to less than the current-carrying capacity of listed indoor communications wire and cable, listed telephone set line cords, and listed communications terminal equipment having ports for external wire line communications circuits. Any over voltage protection, arresters, or grounding connection shall be connected on the equipment terminals side of the secondary protector current-limiting means.
FPN: One way to determine applicable requirements for a listed secondary protector is to refer to UL 497A-1996, Standard for Secondary Protectors for Communications Circuits.
800.81. Drop Wire and Cable. Communications wires and cables without a metallic shield, running from the last outdoor support to the primary protector, shall be listed as being suitable for the purpose and shall have current-carrying capacity as specified in 800.30(A)(1)(b) or 800.30(A)(1)(c).
800.82 Communications Wires and Cables. Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.82(A) through (J). The cable voltage rating shall not be marked on the cable or on the under carpet communications wire. Conductors in communications cables, other than in a coaxial cable, shall be copper.
FPN: Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.
Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.
(A) Type CMP. Type CMP communications plenum cable shall be marked Type CMP and be listed as suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke producing characteristics.
FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handlng Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.
(B) Type CMR. Type CMR communications riser cable shall be marked Type CMR and be listed as suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.
(C) Type CMG. Type CMG general-purpose communications cable shall be marked Type CMG and be listed as suitable for general-purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.
FPN: One method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(D) Type CM. Type CM communications cable shall be marked Type CM and be listed as suitable for general purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Method for Electrical Wires and Cables.
(E) Type CMX. Type CMX limited-use communications cable shall be marked type CMX and be listed as suitable for use in dwellings and for use in raceway and shall also be listed as being resistant to flame spread.
FPN: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.
(F) Type CMUC Under Carpet Wire and Cable. Type CMUC under carpet communications wire and cable shall be marked Type CMUC and be listed as suitable for under carpet use and shall also be listed as being resistant to flame spread.
FPN: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, cables and Flexible Cords.
(G) Multipurpose (MP) Cables.
FPN: The listing of multipurpose cables was discontinued on July 1, 2003.
(H) Communications Wires. Communications wires, such as distributing frame wire and jumper wire, shall be listed as being resistant to the spread of fire.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray

flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

(I) Hybrid Power and Communications Cable. Listed hybrid power and communications cable shall be constructed from two cables, a listed Type NM or NM-B conforming to the provisions of Article 334, and a listed Type CM with the jackets on the listed NM or NM-B and listed CM cables rated for 600 volts minimum, and the hybrid cable listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

800.83 Communications Raceways. Communications raceways shall be listed in accordance with 800.83(A) through (C).

(A) Plenum Communications Raceways. Plenum communications raceways shall be listed as having adequate fire-resistant and low smoke-producing characteristics.

(B) Riser Communications Raceway. Riser communications raceways shall be listed as having adequate fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

(C) General-Purpose Communications Raceway. General-purpose communications raceway shall be listed as being resistant to the spread of fire.

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. Also, the listing requirement for multipurpose cables are deleted because the authorization to list multipurpose cables expires on July 1, 2003.

Panel Meeting Action: Accept in Principle in Part

Accept the recommendations in the proposal to renumber the reference in 725.61(G), FPN from "800.51" to "800.82" as already incorporated into the draft in Proposal 3-126.

Reject the remainder of the proposal.

Panel Statement:

The proposed actions on Article 760 will be addressed in subsequent proposals. The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-194 Log #1662 NEC-P03 (725-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

[Text of Proposal 3-194 recommendation is shown on page 2114]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types CL2D and CL3D, duct have significantly lower fuel load and lower smoke production than conventional Types CL2P and CL3P plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors offices, clean rooms, laboratories, strip malls etc

Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum, and in inaccessible ceiling cavity and raised floor plenums. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution table and figure have been simplified in order to make them easier to understand. Likewise the cable marking table has been simplified. The requirement for the removal of abandoned cables has been removed because it is redundant.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning

for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", "raised floor plenums", and "inaccessible plenums" were not accepted by CMP-3. Section 725.3(B) states that the accessible portion of abandoned Class 2, Class 3 and PLTC Cables shall not be permitted to remain. There has been no substantiation given to warrant a height restriction without physical protection. The submitter has offered no substantiation to warrant the removal of the statement "abandoned cables shall not be permitted to remain."

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-192.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-197 Log #1746 NEC-P03 (725-71) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.

Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (G) and shall be marked in accordance with 725.71(H).

(A) Types CL2P and CL3P. Types CL2P and CL3P plenum cables shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(B) Types CL2R and CL3R. Types CL2R and CL3R riser cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(C) Types CL2 and CL3. Types CL2 and CL3 cables shall be listed as being suitable for general-purpose use, with the exception of risers, ~~ducts,~~ plenums, including ceiling cavity plenums and raised floor plenums, ~~and other space used for environmental air~~ and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 3-197 substantiation is shown on page 2120]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-206 Log #2381 NEC-P03 (725-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-206 recommendatiion is shown on page 2143]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types CL2D and CL3D, duct have significantly lower fuel load and lower smoke production than conventional Types CL2P and CL3P plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors offices, clean rooms, laboratories, strip malls etc

Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum, and in inaccessible ceiling cavity and raised floor plenums. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution table and figure have been simplified in order to make them easier to understand. Likewise the cable marking table has been simplified. The requirement for the removal of abandoned cables has been removed because it is redundant.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", "raised floor plenums", and "inaccessible plenums" were not accepted by CMP-3. Section 725.3(B) states that the accessible portion of abandoned Class 2, Class 3 and PLTC Cables shall not be permitted to remain. There has been no substantiation given to warrant a height restriction without physical protection. The submitter has offered no substantiation to warrant the removal of the statement "abandoned cables shall not be permitted to remain."

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-210 Log #3290 NEC-P03 (725-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise as follows:

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables. Class 2, Class 3, and Type PLTC cables and nonmetallic signaling raceways installed as wiring medthods within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (J) (~~G~~) and shall be marked in accordance with 725.71(K)(~~H~~).

(A) Types CL2P and CL3P. Types CL2P and CL3P plenum cables shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(B) Types CL2R and CL3R. Types CL2R and CL3R riser cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(C) Types CL2 and CL3. Types CL2 and CL3 cables shall be listed as being suitable for general-purpose use, with the exception of risers, ducts, plenums, and other space used for environmental air and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.
Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

(D) Types CL2X and CL3X. Types CL2X and CL3X limited-use cables shall be listed as being suitable for use in dwellings and for use in raceway and shall also be listed as being resistant to flame spread.

FPN: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

(E) Type PLTC. Type PLTC nonmetallic-sheathed, power-limited tray cable shall be listed as being suitable for cable trays and shall consist of a factory assembly of two or more insulated conductors under a nonmetallic jacket. The insulated conductors shall be 22 AWG through 12 AWG. The conductor material shall be copper (solid or stranded). Insulation on conductors shall be suitable for 300 volts. The cable core shall be either (1) two or more parallel conductors, (2) one or more group assemblies of twisted or parallel conductors, or (3) a combination thereof. A metallic shield or a metallized foil shield with drain wire(s) shall be permitted to be applied either over the cable core, over groups of conductors, or both. The cable shall be listed as being resistant to the spread of fire. The outer jacket shall be a sunlight- and moisture-resistant nonmetallic material.

Exception No. 1: Where a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor is applied over the nonmetallic jacket, an overall nonmetallic jacket shall not be required. On metallic-sheathed cable without an overall nonmetallic jacket, the information required in 310.11 shall be located on the nonmetallic jacket under the sheath.

Exception No. 2: Conductors in PLTC cables used for Class 2 thermocouple circuits shall be permitted to be any of the materials used for thermocouple extension wire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.
Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

(F) Class 2 and Class 3 Cable Voltage Ratings. Class 2 cables shall have a voltage rating of not less than 150 volts. Class 3 cables shall have a voltage rating of not less than 300 volts.

(G) Class 3 Single Conductors. Class 3 single conductors used as other wiring within buildings shall not be smaller than 18 AWG and shall be Type CL3. Conductor types described in 725.27(B) that are also listed as Type CL3 shall be permitted.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.
Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

(H) Plenum Signaling Raceways. Plenum signaling raceways listed as plenum signaling raceways shall be permitted for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

(I) Riser Signaling Raceway. Riser signaling raceways shall be listed as having adequate fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

(J) General-Purpose Signaling Raceway. General-purpose signaling raceways shall be listed as being resistant to the spread of fire.

(K)(~~H~~) Marking. Cables shall be marked in accordance with 310.11(A)(2), (3), (4), and (5) and Table 725.71. Voltage ratings shall not be marked on the cables.

FPN: Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1 electric light and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and a voltage marking is required for one or more of the listings.

FPN: Class 2 and Class 3 cable types are listed in descending order of fire resistance rating, and Class 3 cables are listed above Class 2

cables, because Class 3 cables can substitute for Class 2 cables.

Table 725.71 Cable Markings (table was not included with proposal)

Substantiation:

This is the third of three companion proposals to add Nonmetallic Signaling Raceways to Article 725. The same listed raceways are currently found in Articles 770 and 800 for Optical Fiber and Communication Cables. These raceways are commonly being used for the removal of abandon cables and are ideal for signaling cables that are listed for the purpose.

Panel Meeting Action: Accept in Principle

In the second line of the proposal, correct the spelling of "methods."

In proposed (H), change the first part by adding "Listed" at the beginning of the sentence and deleting "listed as plenum signaling raceways." Delete "ducts, plenums, and" in that sentence to read as follows: (H) Plenum Signaling Raceways. Listed plenum signaling raceways shall be permitted for use in other spaces for environmental and…..(Remainder unchanged).

Accept the remainder of the proposal as is.

Panel Statement:

Corrected spelling of the word "methods" in the first line. Inserted "listed" at the beginning of the sentence in (H) and deleted "listed as plenum signaling raceways" since one word added would provide the same as five and mean the same thing. Deleted the permission to use plenum signaling raceways in fabricated ducts or plenums since both 300.22(B) and NFPA 90A do not permit this installation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

CASPARRO: This Proposal is not within the scope of Panel 3 and should be referred to Panel 8 who has jurisdiction over raceways. 725.71 covers listing and marking of Class 2, Class 3, and Type PLTC Cables and does not apply to raceways.

3-190 Log #1070 NEC-P03 **Final Action: Accept in Principle**
(725-71 & 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Hong Chen, OFS

Recommendation:

Revise Section 725.71 as shown below:

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.

Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (H~~G~~) and shall be marked in accordance with 725.71(I~~H~~).

(A) Types CL2D and CL3D. Types CL2D and CL3D duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~A~~B) Types. Types CL2P and CL3P plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:

"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; and "H" to "I".

Revise Table 725.71 Cable Markings as shown below.

Insert Table 725.71 Here

(Table shown on page 2712)

Revise Section 725.61(A), Table 725.61, and Figure 725.61 as shown below. Sections 725.61(B) through (G) do not change.

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables. Class 2, Class 3, and PLTC cables shall comply with the requirements described in 725.61(A) through (~~F~~). (G).

(A) Air Ducts. Cables installed in air ducts shall be Type CL2D or CL3D. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted.

(~~A~~B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ceiling cavity plenums and ~~ducts~~ raised ~~plenums~~ floor plenums, ~~and other spaces used for environmental air~~ shall be Type CL2D or CL3D or, CL2P, or CL3P. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted.

Renumber the remaining subparagraphs as follows:

"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; and "F" to "G".

Revise Table 725.61 as shown below:

Insert Table 725.61 Here

(Table shown on page 2712)

Revise Figure 725.61 Cable Substitution Hierarchy as shown.

Insert Artwork (Figure 725.61) Here

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820, and 830, permit plenum (CL2P, FPLP, CMP, etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP, etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:
1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CL2P, FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and, 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50 with no requirement for a potential heat value.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in a duct. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that: "the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditiioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: The Panel should reconsider its action on the rejected portion of the Proposal in order to: restrict installation of plenum cable to ceiling cavity plenums and raised floor plenums and prohibit installation of unrestricted quantities of plenum cable throughout the air distribution system. Accepting this proposed change will correlate the NEC with NFPA 90A-2002 requirements. The Panel should accept installation of the proposed duct cable in the air distribution system where associated with the air distribution. Also, see comment on Proposal 3-213 (Log #443).

3-199 Log #2358 NEC-P03 **Final Action: Accept in Principle**
(725-71 & 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: J. R. Craig, ComNet

Recommendation:

Revise Section 725.71 as shown:

[Text of Proposal 3-199 recommendation is shown on page 2132]

Substantiation:

[Text of Proposal 3-199 substantiation is shown on page 2134]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative Vote on Proposal 3-169.
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-202 Log #2373 NEC-P03 **Final Action: Accept in Principle**
(725-71 & 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-202 recommendation is shown on page 2138]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?"

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed combustible plenum cable that is the equivalent of CL2P, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50 with no requirement for a potential heat value.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used in an air duct because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee

will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP etc.) from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-203 Log #2375 NEC-P03 **Final Action: Accept in Principle**
(725-71, & 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-203 recommendation is shown on page 2139]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?"

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed combustible plenum cable that is the equivalent of CL2P, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50 with no requirement for a potential heat value.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used in an air duct because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air

ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP etc.) from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-204 Log #2377 NEC-P03 (725-71 & 725.61) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-204 recommendation is shown on page 2141]

Substantiation:

The Technical Committee on Air Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, the Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed combustible plenum cable that is the equivalent of FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Note to NFPA staff: Please provide a copy of the NPRF report to the Code panel.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-192 Log #1222 NEC-P03 (725-71 and 725.61) **Final Action: Accept in Principle in Part**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Richard Fransen, Daiken America, Inc.

Recommendation:

[Text of Proposal 3-192 recommendation is shown on page 2108]

Substantiation:

The Technical Committee on Air Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, the Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA 90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed combustible plenum cable that is the equivalent of FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence, listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Panel Meeting Action: Accept in Principle in Part

This Panel Action text has been incorporated into the Proposal 3-126 rewrite. Section 725.71 will become 725.82 changes. Revise Figure 725.61 Cable Substitution Hierarchy as shown in the Proposal to delete in the top line "Ceiling cavity and raised floor."

[Text of Proposal 3-192 panel action is shown on page 2112]

Panel Statement:

The phrase "a limited fire hazard cable" was deleted from the recommended text since the NEC does not have a definition or explanation for limited fire hazard. The phrase "ducts, plenums, and other spaces for environmental air" was retained since the phrase "ceiling cavity plenums and raised floor plenums" are not recognized in the NEC. In Table 725.71 for cable marking, the phrase "ceiling cavity and raised floor" was deleted from cable marking identification CL3P and CL2P since this phrase is not recognized in the NEC. The same action was taken for Table 725.61.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 8 Negative: 4

Explanation of Negative:

CASPARRO: This proposal should be rejected. Acceptance of this proposal in Principal in Part as modified by Panel 3 does not provide a specific application for this cable type. The NEC is not a product catalog nor is it a design manual and is not intended to contain an all-inclusive list of permitted products. It should also be noted that the panel statement is not consistent with the panel action taken in the MS Word include file (Proposal 3-192 Action and Statement). The title "Ceiling Cavity Plenum" and "Raised Floor Plenum" was deleted from 725.61(A) and was not referenced in the panel statement. Also, the submitter did not provide adequate substantiation why the use of Plenum rated cable should be limited in application and the phrases "ceiling cavity plenum" and "raised floor plenum" are not recognized in the NEC.

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

SANDERS: Reject proposed changes to present 725.61(A) and Table 725.61. It is understood this section and table will retain the same numbering sequence in the 2005 NEC.

Reject proposed changes to present 725.71(A) and FPN. It is understood this section and FPN will be identified as 725.82 and FPN in the 2005 NEC, and a reject will eliminate the necessity of renumbering the following parts of this section.

While there is no problem with adding the suggested reference to present 725.71(A) FPN as a new last sentence, a straight reject was selected for ROP 3-192 because of the multiple issues addressed by this one ROP. A comment will be made to bring back for review in December 2003 for CMP 03 ROC consideration this FPN sentence. This will meet the submitter's concern that users of the NEC should be

made aware of the need to review the information provided in NFPA 90A-2002, where this rejected FPN presently resides.

This change to provide additional cable designators was predicted upon CMP 03 accepting several ROPs affecting 300.22, which were rejected due to lack of documentation that additional subcategories of "other space used for environmental air" were necessary. [See Proposals 3-89 (Log #1727), 3-90 (Log #1728), 3-91 (Log #299), 3-92 (Log #1220a) and 3-94 (Log #446)].

At present, there are two types of environmental air handling mechanisms in 300.22(B) (i.e., ducts, or plenums specifically fabricated to transport environmental air). In addition a third type is provided for in 300.22(C) for other spaces that are not of the duct variety or that does not meet the condition of being specifically fabricated, such as blower rooms, above room ceiling spaces or below floor cavities. Below floor cavities may also have to meet the requirements of Article 645, which can and does set additional conditions on wiring methods permitted under raised floors for Information Technology equipment.

Lacking this documentation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the existing type CL2P and CL3P plenum cable are not suitable for use in the environmental air handling spaces included in 300.22(C).

The use of the word "adequate" in present 725.71(A) (identified as 725.82 for 2005 NEC) is intended to provide the necessary guidance for evaluating and listing of products used in spaces that are not specifically fabricated for transporting environmental air. Note that it is always possible to employ more stringent installation methods not specifically mentioned in the NEC.

Comment on Affirmative:

AYER: I agree with the concept of allowing the use of a limited combustible cable. If you read the code closely there is no application at the present time for a listed cable, which can be installed in Ducts or plenums as specified in 300.22(B).

The wording in Article 725 of where cables may be installed can be confusing. The present wording states that Type CL2P and CL3P cables can be installed "in ducts, plenums, or other spaces used for environmental air". This leaves the designer or installer to think that he can install this type cable in either locations of 300.22(B) or (C) when technically he can only install this cable in 300.22(C).

The proposed 725.71(B) should be reworded to state that Type CL2P and CL3P cables can be used "in other spaces used for environmental air". The designer or installer will be better able to draw a distinction that limited low combustible cables can be installed in accordance with 300.22(B) or (C) and plenum cables can be installed in 300.22(C).

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.

Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (H~~G~~) and shall be marked in accordance with 725.71(I~~H~~).

(A) Types CL2D and CL3D. Types CL2D and CL3D duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as ~~a limited fire hazard cable~~ having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

(~~A~~B) Types of CL2P and CL3P. Types CL2P and CL3 plenum cable shall be listed as being suitable for use in d~~ucts, plenums, and other space for environmental air~~ducts, plenums, and ~~-~~other spaces used for environmental air ~~ceiling cavity plenums and raised floor plenums~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

"725.61(A) ~~Ceiling Cavity Plenums and Raised Floor~~ Ducts and Plenums. Cables installed in ~~ceiling cavity plenums and raised floor plenums -~~ducts, plenums, and other spaces for environmental air shall be Type CL2D, ~~or Type~~ CL3D, ~~Type CL2P or Type CL3P. Abandoned cables shall not be permitted to remain.~~ Listed wires and cables installed in compliance with 300.22 shall be permitted.

725.61(B~~A~~) Other spaces used for environmental air ~~Plenum~~. Cables installed in ~~ducts, plenums, and -~~other spaces used for environmental air shall be Type Cl2P or CL3P. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted."

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-193 Log #1438 NEC-P03 **Final Action: Accept in Principle**
(725-71 and 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Dan Kennefick, Ber-Tek a Nexans Company

Recommendation:

Revise 725.71 as shown below:

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables. Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (H ~~G~~) and shall be marked in accordance with 725.71 (I ~~H~~).

(A) Types CL2D and CL3D. Types CL2D and CL3D duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System, for materials installed in ducts and plenums.

(~~A~~ B) Types CL2P and CL3P. Types CL2P and CL3P plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested n accordance with NFPA 262, 1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining subparagraphs as follows:
"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; and "H" to "I".

Revise Table 725.71 Cable Markings as shown below:

INSERT TABLE 725.71 HERE

(Table shown on page 2714)

Revise Section 725.61(A), Table 725.61, and Figure 725.61 as shown below. Sections 725.61(B) through (G) do not change.

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables. Class 2, Class 3, and PLTC cables shall comply with the requirements described in 725.61(A) through ~~(F).~~ (G).

(A) Air Ducts. Cables installed in air ducts shall be Type CL2D or CL3D. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted.

(~~A~~ B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ceiling cavity plenums and ~~ducts,~~ raised ~~plenums~~ floor plenums~~, and other spaces used for environmental air~~ shall be Type CL2D or CL3D or CL2P or CL3P. Abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted.

Renumber the remaining subparagraphs as follows:
"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; and "F" to "G"

Revise Table 725.61 as shown below:

INSERT TABLE 725.61 HERE

(Table shown on page 2714)

Revise Figure 725.61 as shown below:

INSERT FIGURE 725.61 HERE
Figure 725.61 Cable Substitution Hierarch

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, had made a series of proposals to correlate NFPA 70, National Electrical Code, with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820, and 830, permit plenum (CL2P, FPLP, CMP, etc.), cable to be installed in "ducts, plenums and other space used for environment

air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP, etc.), to ceiling cavity and raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A? In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

(1) Listed noncombustible cable

(2) Listed limited combustible cable that has a maximum smoke developed index of 50

(3) Listed combustible plenum cable that is the equivalent of CL2P, FPLP, CMP, etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50 with no requirement for a potential heat value.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used in an air duct because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not be qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.), because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. Also see my presentation from the BICSI 2002 Spring Conference.

Two paragraphs from the substantiation to the proposal from the Air-Conditioning Committee are shown below:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

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

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-208 Log #2555 NEC-P03 **Final Action: Accept in Principle**
(725-71 and Table 725.71)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 725.71 as shown below:
725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.
725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.
Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (HG) and shall be marked in accordance with 725.71(IH).
(A) Types CL2D and CL3D. Types CL2D and CL3D duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.
FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for materials installed in ducts and plenums.
(AB) Types CL2P and CL3P. Types CL2P and CL3P plenum cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.
FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for installation in ceiling cavity plenums and raised floor plenums.
Renumber the remaining existing subparagraphs as follows:
"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; and "H" to "I".
Revise Table 725.71 Cable Markings as shown below.

INSERT Table 725.71 HERE

(Table shown on page 2715)

Substantiation:

[Text of Proposal 3-208 substantiation is shown on page 2151]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-189 Log #63 NEC-P03 **Final Action: Accept in Principle**
(725-71, Figure 725.41, 725.52(B), 725.52(B) Exception No. 2 and 725.82 (new))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete Section 725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.
In Figure 725.41, change "725.71" to "725.82".
In 725.52(B) and 725.52(B) Exception No. 2, change "725.71" to "725.82."
Create a new section VI "Listing Requirements":
VI. Listing Requirements
725.82 Class 2, Class 3, and Type PLTC Cables.
Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed in accordance with 725.83(A) through (G) and shall be marked in accordance with 725.82(H).
(A) Types CL2P and CL3P. Types CL2P and CL3P plenum cables shall be marked as Type CL2P or CL3P respectively, and be listed as suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.
FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.
(B) Types CL2R and CL3R. Types CL2R and CL3R riser cables shall be marked as Type CL2R or CL3R respectively, and be listed as suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.
(C) Types CL2 and CL3. Types CL2 and CL3 cables shall be marked as Type CL2 or CL3 respectively, and be listed as suitable for general-purpose use, with the exception of risers, ducts, plenums, and other space used for environmental air and shall also be listed as being resistant to the spread of fire.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(D) Types CL2X and CL3X. Types CL2X and CL3X limited-use cables shall be marked as Type CL2X or CL3X respectively, and be listed as being suitable for use in dwellings and for use in raceway and shall also be listed as being resistant to flame spread.
FPN: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.
(E) Type PLTC. Type PLTC nonmetallic-sheathed, power-limited tray cable shall be listed as being suitable for cable trays and shall consist of a factory assembly of two or more insulated conductors under a nonmetallic jacket. The insulated conductors shall be 22 AWG through 12 AWG. The conductor material shall be copper (solid or stranded). Insulation on conductors shall be suitable for 300 volts. The cable core shall be either (1) two or more parallel conductors, (2) one or more group assemblies of twisted or parallel conductors, or (3) a combination thereof. A metallic shield or a metallized foil shield with drain wire(s) shall be permitted to be applied either over the cable core, over groups of conductors, or both. The cable shall be listed as being resistant to the spread of fire. The outer jacket shall be a sunlight- and moisture-resistant nonmetallic material.
Exception No. 1: Where a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor is applied over the nonmetallic jacket, an overall nonmetallic jacket shall not be required. On metallic-sheathed cable without an overall nonmetallic jacket, the information required in 310.11 shall be located on the nonmetallic jacket under the sheath.
Exception No. 2: Conductors in PLTC cables used for Class 2 thermocouple circuits shall be permitted to be any of the materials used for thermocouple extension wire.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible cords.
Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(F) Class 2 and Class 3 Cable Voltage Ratings. Class 2 cables shall have a voltage rating of not less than 150 volts. Class 3 cables shall have a voltage rating of not less than 300 volts.
(G) Class 3 Single Conductors. Class 3 single conductors used as other wiring within buildings shall not be smaller than 18 AWG and shall be Type CL3. Conductor types described in 725.27(B) that are also listed as Type CL3 shall be permitted.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cable trays as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(H) Marking. Cables shall be marked in accordance with 310.11(A)(2),(3),(4), and (5). Voltage ratings shall not be marked on the cables.
FPN: Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1 electric light and power applications.
Exception: Voltage markings shall be permitted where the cable has multiple listings and a voltage marking is required for one or more of the listings.

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725, 760, 770, 800, 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and Fire Alarm circuits were moved from Articles 725 and 760 to Chapter

9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible.

Panel Meeting Action: Accept in Principle

Accept the recommendations in the proposal as already incorporated into the final draft of Proposal 3-126. Ensure the reference in Figure 725.41 has been changed from "725.71" to "725.82."

Panel Statement:

The proposed changes to Article 725 are incorporated into the actions in Proposal 3-126.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-195 Log #1698 NEC-P03 **Final Action: Accept in Principle**
(725-71, Table 725.71, 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Patricia Jenks, Krone Digital Communications

Recommendation:

[Text of Proposal 3-195 recommendation is shown on page 2115]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770,
820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.
NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.
Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code

panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", "raised floor plenums", and "inaccessible plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-196 Log #1702 NEC-P03 **Final Action: Accept in Principle**
(725-71, Table 725.71, 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Robert Dennelly, Avaya

Recommendation:

[Text of Proposal 3-196 recommendation is shown on page 2118]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, the article I have provided: "Burning Issue - New Plenum Cable Enhances Fire Safety" from the February 2001 issue of "Cabling Business Magazine," by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition

(2005) of NFPA 90A.

Note: Supporting Material avaialble for review at NFPA headquarters.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", "raised floor plenums", and "inaccessible plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).

EASTER: See my Explanation of Negative Vote on Proposal 3-169.

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-198 Log #1848 NEC-P03 **Final Action: Accept in Principle**
(725-71, Table 725.71, 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise Section 725.71 as shown below:

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables.

Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (H~~G~~) and shall be marked in accordance with 725.71(I~~H~~).

(A) Types CL2D and CL3D. Types CL2D and CL3D duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~A~~B) Types CL2P and CL3P. Types CL2P and CL3P plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other spaces used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining existing subparagraphs as follows:

"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; and "H" to "I".

Revise Table 725.71 Cable Markings as shown below.

Insert Table 725.71 Here

(Table shown on page 2715)

Revise Section 725.61(A), Table 725.61, and Figure 725.61 as shown below. Sections 725.61(B) through (G) do not change.

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables. Class 2, Class 3, and PLTC cables shall comply with the requirements described in 725.61(A) through (F).

(A) Air Ducts and Plenums.

Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CL2D or Type CL3D and shall be associated with the air duct system. Listed conductors and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CL2D or Type CL3D and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CL2D or Type CL3D cable shall be mechanically protected to a height of 7 ft above the floor. Listed conductors and cables installed in compliance with Section 300.22 shall be permitted.

(b) Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Types CL2D, CL3D, CL2P or CL3P. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CL2D or Type CL3D. The accessible portion of abandoned cables shall not be permitted to remain. Listed wires and cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditiioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

Revise Table 725.61 as shown below:

Insert Table 725.61 Here

(Table shown on page 2715)

Insert Figure 725.61 Here

Substantiation:

I am a member of the 90A Committee who worked on the 2002 90A Standard and voted in favor of the listing requirement for "limited combustible cable"*, which is now included in the document. However, the 2002 edition of the 90A Standard does not address the installation of wire and cable in ducts and plenums, other than ceiling cavity plenums and raised floor plenums.

Since there are field applications where cables are installed inside ducts and other than ceiling cavity plenums and raised floor plenums, it seems prudent that the Class of cables described herein should be required since they meet all the requirements for supplementary materials plus they meet all the requirements for use in ceiling cavity and raised floor plenums.

Since these cables are inaccessible, it is not feasible to remove them. Therefore, a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Based on extensive work by the FPRF, the Types of cables described herein have significantly lower fuel load and lower smoke production than conventional plenum cables Types.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording contained in proposals submitted by the 90A Committee. The cable substitution table and figure have been revised in order to make them easier to understand.

*Note: The term limited combustible was not used in the proposed text. The Standards Council, in a recently, directed that this term not be used for cables.

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed for duct cable.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", "raised floor plenums", and "inaccessible plenums" were not accepted by CMP-3. Section 725.3(B) states that the accessible portion of abandoned Class 2, Class 3 and PLTC Cables shall not be permitted to remain.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-200 Log #2369 NEC-P03 **Final Action: Accept in Principle**
(725-71 Table, 725.71, 725.61, Table 725.61, and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-200 recommendation is shown on page 2135]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee

will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums", and "raised floor plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-201 Log #2371 NEC-P03 **Final Action: Accept in Principle**
(725-71,Table 725.71, 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-201 recommendation is shown on page 2136]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, , "Burning Issue- New Plenum Cable Enhances Fire Safety" from the February 2001 issue of Cabling Business Magazine, by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and

plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-205 Log #2379 NEC-P03 **Final Action: Accept in Principle**
(725-71, Table 725.71, & 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 3-205 substantiation is shown on page 2142]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

Relevant sections of 2002 edition of NFPA 90A are attached.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-207 Log #2438 NEC-P03 **Final Action: Accept in Principle**

(725-71, Table 725.71, 725.61, Table 725.61, and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

[Text of Proposal 3-207 recommendation is shown on page 2145]

Substantiation:

[Text of Proposal 3-207 substantiation is shown on page 2147]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: The Panel should reconsider its action on the rejected portion of the Proposal in order to: restrict installation of plenum cable to ceiling cavity plenums and raised floor plenums and prohibit installation of unrestricted quantities of plenum cable throughout the air distribution system. Accepting this proposed change will correlate the NEC with NFPA 90A-2002 requirements. The Panel should accept installation of the proposed duct cable in the air distribution system where associated with the air distribution. Also, see comment on Proposal 3-213.

The Panel overlooked the substantiation in the proposal for protecting cables in an air-handling room plenum to 7' above the floor. The substantiation in the proposal is from interviews with experienced HVAC installers and service technicians, who provide protection of cable to 7' above the floor of air-handling room plenums as being necessary. Providing protection for cables to 7' above the floor mirrors the requirements for fire alarm cable. NPFA 90A requires air inlets below 7' to be protected, so a similar requirement for cable makes sense. [NFPA 90A-2002, "4.3.4.3.4 Service openings shall not be required where all the following conditions exist:

(2) The air inlets are at least 2.13 m (7 ft) above the floor or are protected by corrosion-resistant metal screens of at least 14 mesh (0.07 in.)...".

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-209 Log #3020 NEC-P03 **Final Action: Accept in Principle**
(725-71,Table 725.71, 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Bob Allen, Mohawk/DCT

Recommendation:

Revise Section 725.71 as shown below:

[Text of Proposal 3-209 recommendation is shown on page 2153]

Substantiation:

[Text of Proposal 3-209 substantiation is shown on page 2155]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-211 Log #3425 NEC-P03 **Final Action: Accept in Principle**
(725-71, Table 725.71, 725.61, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Robert Wessels, CommScope Inc.

Recommendation:

[Text of Proposal 3-211 recommendation is shown on page 2156]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 725, 770, 800, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable

The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

In summary, this proposal establishes limited fire hazard duct cable for used in plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (CL2P, OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-191 Log #1143 NEC-P03 **Final Action: Accept in Principle**
(725-71, Table 725.71, Table 725.61 and Figure 725.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Revise Section 725.71 as follows:

725.71 Listing and Marking of Class 2, Class 3, and Type PLTC Cables. Class 2, Class 3, and Type PLTC cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 725.71(A) through (H~~G~~) and shall be marked in accordance with 725.71 (I~~H~~)

(A) Types CL2D and CL3D. Types CL2D and CL3D duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~A~~B) Types CL2P and CL3P. Types CL2P and CL3P plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.5 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining existing subparagraphs as follows:
"B" TO "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; and "H" to "I".

Revise Table 725.71 Cable markings as shown below:

INSERT TABLE 725.71 HERE

(Table shown on page 2713)

Revise Section 725.61(A), Table 725.61 and Figure 725.61 as shown below. Sections 725.61(B) through (G) do not change.

725.61 Applications of Listed Class 2, Class 3, and PLTC Cables. Class 2, Class 3, and PLTC cables shall comply with the requirements described in 725.61(A) through (F).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CL2D or Type CL3D and shall be associated with the air duct system. Listed conductors and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CL2D or Type CL3D and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CL2D or Type CL3D cable shall be mechanically protected to a height of 7 feet above the floor. Listed conductors and cables installed in compliance with Section 300.22 shall be permitted.

(b~~A~~) ~~Plenum~~. Cables installed in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type CL2D, CL3D, CL2P or CL3P. Abandoned cables shall not be permitted to remain. Listed conductors ~~wires~~ and cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

Revise Table 725.61 as shown below:

INSERT TABLE 725.61 HERE

(Table shown on page 2713)

Revise Figure 725.61 Cable Substitution Hierarchy as shown below:

INSERT FIGURE 725.61 HERE

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP, etc.) cable to be installed in "ducts, plenums, and other space used for environmental air, while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the air-conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums". The answers is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum able (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A."

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish 'limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for use in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposals 3-192 and 3-213. The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-169 (Log #2554).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-212 Log #1609 NEC-P03 **Final Action: Accept**
(Table 725-71, Table 760.71)

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

In Tables 725.71 and 760.71, delete the column headed "Reference".

Substantiation:

The "Reference" column is not needed since the cable markings tables are adjacent to the listing requirements in each article. Keep it simple!

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-213 Log #443 NEC-P03 **Final Action: Reject**
(725-71(A), 760.31(C), 760.71 (D))

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise Sections 725.71(A), 760.31(C), and 760.71(D) as follows:

725.71(A) Types CL2P and CL3P. Types CL2P and CL3P plenum cables shall be listed as being suitable for use in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other space used for environmental air~~ and shall be listed as having adequate fire-resistant and low smoke-producing characteristics.

760.31(C) Type NPLFP. Type NPLFP non-power-limited fire alarm cable~~ for use in other space used for environmental air~~ shall be listed as being suitable for use in ceiling cavity plenums and raised floor plenums ~~other space used for environmental air as described in 300.22(C)~~ and shall be listed as having adequate fire-resistant and low smoke-producing characteristics.

760.71(D) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ceiling cavity plenums and raised floor ~~in ducts~~ plenums, ~~and other space used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. The permission to use plenum cables in air ducts and plenums, other than ceiling cavity and raised floor plenums is proposed to be deleted to correlate with NFPA 90A.

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

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 8 Negative: 4

Explanation of Negative:

AYER: The plenum cable is already limited in application in 725.61(A) and is limited to areas permitted by 300.22(C), which is clearly "Other spaces used for environmental air". By eliminating the words "ducts and plenums" and leaving only "other spaces used for environmental air", the designer or installer will be able to clearly differentiate that these cables may only be installed in areas permitted by 300.22(C). It is already understood that ceiling cavities are already included in 300.22(C). Adding the words "raised floor plenums" to the fine print note may add clarity and achieve the submitter's intent. I have revised the wording as follows:

725.71(B~~A~~) Types CL2P and CL3P. Types CL2P and CL3P plenum cables shall be listed as being suitable for use in ~~ceiling cavity plenums and raised floor plenums, ducts, plenums, and~~ other spaces used for environmental air as described in 300.22(C) and shall be listed as having adequate fire-resistant and low smoke-producing characteristics.

760.31(C) Type NPLFP. Type NPFLP non-power-limited fire alarm cable~~ for use in other space used for environmental air~~ shall be listed as being suitable for use in ~~ceiling cavity plenums and raised floor plenums~~ other spaces used for environmental air as described in 300.22(C) and shall be listed as having adequate fire-resistant and low smoke-producing characteristics.

760.71(D) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use~~ in ceiling cavity plenums and raised floor~~ in ~~ducts plenums, and~~ other spaces used for environmental air as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

EGESDAL: Panel Statement: The Panel Statement does not comply with the guidance provided in the meeting notice, which requires: Panel "statements must be sufficiently detailed so as to convey the panel's exact justification for its action. This will assist members of the Association in their deliberations at the Annual Meeting of the Association and permit the submitter to develop additional material for rebuttal if so desired." The Panel Statement for this Proposal is inadequate, reading as follows: "The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application." The Panel did not identify which data in the proposal's substantiation was inadequate, nor list restrictions imposed or data required for reconsideration and acceptance of the proposal. Without a detailed technical substantiation for rejecting the proposal, the Technical Committee on Air Conditioning will have difficulty responding to the Panel's rejection.

The Panel seemingly provides its own substantiation for accepting this Proposal in the Panel Statement on Proposal 3-89, and in the Panel Action and Panel Statement in Proposal 3-133.

Acceptance of this proposal will resolve the conflict between the NEC and NFPA 90A-2002. According to Sections 725.71 and 760.71, "plenum cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air." According to Sections 725.61 and 760.61, "Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type…." According to NFPA 90A-2002, 4.3.10.2 Ceiling Cavity Plenum, "4.3.10.2.6.1 Electrical wires and cables and optical fiber cables shall be listed as noncombustible or limited combustible and have a maximum smoke developed index of 50 or shall be listed as having a maximum smoke optical density of 0.5 or less on a specific optical density of 0.15 or less and a maximum flame spread distance of 1.5 m (5

maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.5 m (5 ft) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces." Raised floor plenum requirements are identical. The NEC requirements permits unrestricted quantities of cable in air ducts and plenums, rather than restricting plenum cable to ceiling cavity and raised floor plenums. The NEC requirement to permit plenum cable in ducts and plenums, other than ceiling and raised floor plenums is a conflict.

NFPA 90A-2002 has test requirements for supplementary materials associated with the air distribution system. According to NFPA 90A-2002, 4.3.3, Supplementary Materials for Air Distribution Systems, "4.3.3.1 Pipe insulation and coverings, duct coverings, duct linings, vapor retarder facings, adhesives, fasteners, tapes, and supplementary materials added to air ducts, plenums, panels, and duct silencers used in duct systems, unless otherwise provided for in 4.3.3.1.2 or 4.3.3.1.3, shall have, in the form in which they are used, a maximum flame spread index of 25 without evidence of continued progressive combustion and a maximum smoke developed index of 50 when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials. Listed plenum cables are not tested to NFPA 255 to meet the Supplementary Materials requirements. NFPA 90A addresses electric wiring in ducts and plenums in Chapter 6, "6.1 Wiring. The installation of electrical wiring and equipment associated with the operation and control of air-conditioning and ventilating systems shall be in accordance with NFPA 70, National Electrical Code."

In addition to flame spread and smoke developed index, NFPA 90A-2002 has temperature test requirements for Supplementary Materials: "4.3.3.3.1 In no case shall the test temperature be below 121°C (250°F)." Duct and plenums (air-handling unit plenums, duct distribution plenums, and apparatus casing plenums may have temperatures up to the test temperature. According to the UL listing for plenum cable, the marking on the cable is permitted to be as low as 60C. Plenum cables are not tested to NFPA 255 to qualify as a Supplementary Material.

NFPA 90A-2002 has temperature requirements for Ceiling Cavity Plenum (and Raised Floor Plenum): "4.3.10.6.3 The temperature of air delivered to these plenums shall not exceed 121°C (250°F)." Ceiling cavity plenums and raised floor plenums are typically use for return air from habitable space. It would be unusual for the return air temperature to exceed the permitted plenum cable 60C temperature rating.

However, air duct and plenums (air-handling unit plenums, duct distribution plenums, and apparatus casing plenums may have temperatures as high as the test temperature. According to the UL listing for plenum cable, the marking on the cable is permitted to be as low as 60C [Example: UL Category HNIR]. Plenum cables are tested to NFPA 262, and are not tested to NFPA 255 to qualify as a Supplementary Material.

The Panel should accept the Technical Committee on Air Conditioning's proposals.

HORMAN: The proposal should be accepted. The concepts of "ceiling cavity plenums" and "raised floor plenums" with restriction of wiring methods within those areas should be accepted as proposed so the NEC will correlate more closely with NFPA 90A 2002 edition.

KUMANDAN: See my Explanation of Negative on Proposal 3-132.

3-214 Log #1391 NEC-P03 **Final Action: Accept**

(725-71(A), 760.31 (C), 760.71 (D))

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise current FPN, which reads, in Articles 725, 760, 770, 800, and 820, (Article 830 is similar.):

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

To (proposed new text):

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air-Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity lenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable, and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal would editorially revise the listing requirements for plenum cable by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-215 Log #1729 NEC-P03 **Final Action: Accept in Principle**
(725-71(A), FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle

Panel Statement:

Since Proposal 3-214 was submitted by the NFPA Committee on Air Conditioning the Panel has accepted the text in that Proposal. The submitter has not provided any information as to the differences in the wording between the fine print note from NFPA 90A and his recommendation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-216 Log #3308 NEC-P03 (725-71(F)) **Final Action: Reject**

Submitter: Edward Walton, Draka USA

Recommendation:

Insert new paragraph 725.71(F) improper place and renumber the existing paragraphs and references to renumbered paragraphs accordingly. New paragraph 725.71(F) to read as follows:

(F) Circuity Integrity (CI) Cable. Cables suitable for use in remote-control, signaling, and power-limited circuits that are critical to life safety, property protection, or emergency management in order to ensure continued circuit operation for a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 725.71(A), (B), (C), (D) and (E) that meet the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, CL2P-CI, CL3P-CI, CL2R-CI, CL3R-CI, CL2-CI, CL3-CI, CL2X-CI, CL3X-CI and PLTC-CI).

FPN: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistive Cables.

Substantiation:

A heightened interest in the ability to maintain certain operations throughout the entire time of an emergency has prompted numerous agencies to require that steps be taken to assure the circuit integrity and survivability of certain critical remote-control, signaling, and power-limited circuits during a fire in a building. It is vitally important that NFPA 70, National Electrical Code, offer a code-complying method for meeting these requirements.

Designers and installers of electrical systems, continually seek performance guidance from the NEC in order to assure the safety of electrical installations. It behooves the NEC to make certain that it makes suitable provisions to recognize specialized electrical components and installation methods that will allow building owners to meet requirements of other documents that seek to assure life safety, property protection, and emergency management.

Panel Meeting Action: Reject

Panel Statement:

This proposal is providing listing and marking requirements for the cable without providing any usage of this particular cable within Article 725. Before a material can be included in Article 725, it must have an application, such as would be provided in 725.61. There has not been any substantiation submitted providing technical data on the types of circuits and the reason for the survivability of the cable that should be covered by this circuit integrity cable.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-217 Log #3191 NEC-P03 (727) **Final Action: Reject**

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Mass Electrical Code Adv. Committee

Recommendation:

Delete this article.

Where a provision of the National Electrical Code refers to requirements for overcurrent protection for Type ITC cable, the Technical Correlating Committee should revise said provision to refer to 725.23 Exception No. 2. Where a provision of the National Electrical Code refers to other requirements for Type ITC cable, the Technical Correlating Committee should revise said provision to refer to 725.27(C) of this Code.

Substantiation:

This is a companion proposal to another on 725.27 which brings the essential requirements of Article 727 into Article 725, and a third proposal to add certain material as a new 725.23 Exception No. 2. The principle substantiation is on the proposal for the new 725.27(C). Please refer to that proposal for more information.

Panel Meeting Action: Reject

Panel Statement:

Adding the information from Article 727, deleting Article 727, and incorporating the information into a new subsection of 725.27 does not accomplish anything more than make Article 725 more complex and difficult to understand.

The original purpose of creating a separate Article 727 was to provide separation from Class 1 circuits and not confuse people with an additional "Class 4" system that had a very specific purpose in industrial wiring. The scope of Article 727 provides the overall concept of ITC in that it is to be used exclusively for instrumentation and control circuits operating at 150 volts and 5 amps or less. Incorporating this information into Article 725 would tend to obscure the information and make it less user-friendly to the industrial facilities wishing to employ this system.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-218 Log #119 NEC-P03 (727-4) **Final Action: Accept in Principle in Part**

Submitter: James M. Daly, General Cable

Recommendation:

Revise as follows:
(4) Exposed when ~~As open wiring where~~ enclosed...
(5) ~~As open wiring w~~ Without a metallic sheath or armor between cable tray and equipment in lengths not to exceed 15 m (50 ft), where the cable is supported and protected against physical damage using mechanical protection, such as struts, angles ~~angels~~ or channels. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).
(6) ~~As open wiring~~ Exposed without a metallic sheath or armor, between cable tray and equipment in lengths not to exceed 15 m (50 ft), where the cable complies with the crush and impact requirements of Type MC cable and identified for such use. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

Substantiation:

This is one of a series of proposals to provide consistency throughout the code in the use of the terms "exposed", "open wiring", and "open runs" as applied to wiring methods.
"Exposed" is used 306 times throughout the code, "open runs" is used 7 times, and "open wiring" is used 29 times but only 10 of those instances do not refer to "open wiring on insulators".
Exposed is defined in Article 100 as shown below.
"Exposed (as applied to live parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts that are not suitably guarded, isolated or insulated."
"Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access."
Open wiring on insulators is defined in 398.2 as "An exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings."
"Open runs" is not defined in the code.
This series of proposals will limit the term "open wiring" to open wiring on insulators (Article 398) and have the term "exposed" apply to "open runs" and open wiring not on insulators.
Wire and cable that must be continuously supported and protected will be specifically addressed in the applicable section.

Panel Meeting Action: Accept in Principle in Part

Accept the deletion of the phrase "as open wiring" in (4),(5),(6). Capitalize the "B" in the word "Between" in (6). Reject the remainder of the Proposal.

Panel Statement:

See the Panel Action on Proposal 3-220 where the phrase "open wiring" has been deleted. Substituting "exposed" in place of "open wiring" would imply that ITC cable could not be concealed in the wall, ceiling, or floor, based on the definition. Open wiring, in this case, is permitted where the individual conductors are enclosed in metallic sheaths, etc. and not just run as open conductors. Adding the phrase "without a metallic sheath or armor" has not been substantiated in the Proposal.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-219 Log #3470 NEC-P03 (727-4) **Final Action: Reject**

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

Recommendation:

Delete the section in its entirety.

Substantiation:

The National Electrical Code is prescriptive code. To say "where the conditions of maintenance and supervision ensure that only qualified persons service the installation," is a performance requirement. Without prescriptive requirements indicating whether this qualified person is an employee of the owner of the premises or is a separately contracted person and the Authority Having Jurisdiction has a means of verification of the continued employment of the qualified person and whether the qualified person has been verified by the authority having jurisdiction as meeting the definition of a qualified person as shown in the definitions of this Code no prescriptive requirements have been followed.
To permit relaxation of the safety requirements of this Code without establishing a positive guarantee that the safety of persons and property is indisputably assured is a reprehensible act.

Panel Meeting Action: Reject

Panel Statement:

The definition of term "qualified person" has been changed in the 2002 NEC to more accurately reflect who is considered to be a qualified person. That definition is as follows: "One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved." It should not matter if the qualified person is separately contracted or is employed by the owner of the facility.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-220 Log #2904 NEC-P03 **Final Action: Accept in Part**
(727-4(4), 727.4(5), 727.4(6))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Revise as follows:

(4) ~~As open wiring where~~ Enclosed in a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor applied over the nonmetallic sheath in accordance with 727.6. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

(5) ~~As open wiring~~ Without a metallic sheath or armor between cable tray and equipment in lengths not to exceed 15 m (50 ft), where the cable is supported and protected against physical damage using mechanical protection, such as struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

(6) ~~As open wiring between cable tray and equipment in~~ In lengths not to exceed 15 m (50 ft), where the cable complies with the crush and impact requirements of Type MC cable and is identified for such use. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

Substantiation:

The phrase "Open Wiring' appears more than 30 times in the current 2002 NEC, but it exists in two distinct formats: a) as the defined term "open wiring on insulators" by Article 398.2, or b) simply as the undefined term "open wiring". With the defined term, open wiring makes reasonable sense. However when used as the undefined term "open wiring", especially when used to describe a cable that is required to have mechanical integrity and protection takes on an entirely different meaning. Clearly such an installation is not "open". Due to the significant difference in the use of the terms, this and associated other proposals if accepted would replace the undefined use of the term "open wiring" with more appropriate language that addresses the installation in 501.4(B)(1)(5); 501.5 Exception No. 2; 503.3(B); 504.30(A)(1); 505.15(C)(1)(c); 505.16(C)(1) Exception No. 2; 610.12(A); 725.61(D)(4) and 727.4(4)(5)(6); and use the full-Article 398.2 defined term where the text suggests as in 300.16(A); 312.5(B); 314.17(b); 314.17(C). Again, individual proposals have been submitted to address each section mentioned.

Panel Meeting Action: Accept in Part

Accept the deletion of the words in (4) and (5). Accept the deletion of the three words "as open wiring" in (6), capitalize the "B" in the word "between" and reject the remainder of the Proposal.

Panel Statement:

The submitter has not provided any technical substantiation to expand permission for the use of this cable to all applications. Permission for the 50-foot length from the cable tray to the equipment was an attempt to provide an installer/user to not be required to enclose the cable in a raceway or similar enclosure but for a very limited application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

PACE: If cables meet the same crush and impact requirements, and are identified for use in "open" (exposed) wiring, then both should perform the same when subjected to identical conditions in the field. There is no technical reason to limit this installation method to just between a cable tray and the equipment. This installation method should be allowed where it is needed to run between two pieces of equipment. There is no difference in the conditions the cable will be subjected to nor the requirements to protect the cable whether it is installed from a cable tray to a piece of equipment, or if it is installed in the same manner, routing, and distance from one piece of equipment to another. It will add confusion and unnecessary burden in the field to allow this cable to run from a cable tray to the first piece of equipment then require a different installation method from that equipment to the next piece of equipment.

3-221 Log #120 NEC-P03 **Final Action: Accept in Part**
(727-4(5)(6))

Submitter: James M. Daly, General Cable

Recommendation:

Revise as follows:

(5) ~~As open wiring w~~ Without a metallic sheath or armor, between a cable tray and the utilization equipment or device ~~in lengths not to exceed 15 m (50 ft),~~ where the cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles ~~angels,~~ or channels. The cable shall be ~~supported and~~ secured at intervals not exceeding 1.8 m (6 ft).

(6) ~~As open wiring~~ Exposed without a metallic sheath or armor, between a cable tray and the utilization equipment or device ~~in lengths not to exceed 15 m (50 ft),~~ where the cable complies with the crush and impact requirements of Type MC cable and is identified for such use. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

Interchange (5) and (6).

Substantiation:

This revision will make the installation requirements for ITC cable similar to those specified in 336.10(6) for Type TC cable.

The term "open wiring" has caused confusion ever since it was first introduced, so that term was deleted from TC cable in the 2002 Code. UL agreed to define a substitute identifier. The same substitute identifier could be used for ITC cable in (6). The use of the term "open wiring" is addressed in a separate proposal.

Code-Making Panel 7 also agreed to remove the 15 m (50 ft) length limitation in exchange for having the cable continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channels. If "continuously supported" is used in the first sentence in (5), then "supported and" is not necessary in the second sentence.

ITC cable that complies with the crush and impact requirements of Type MC cable should only be required to be secured and supported every 1.8 m, whereas, ITC cable that does not meet those requirements should be continuously supported and protected.

Interchanging (5) and (6) will make a more logical decreasing mechanical strength sequence from (4) to (6).

Panel Meeting Action: Accept in Part

Accept the deletion of the phrase "As open wiring" in the Proposal and reject the remainder of the Proposal.

Panel Statement:

See the Panel Action on Proposal 3-220 where the phrase "open wiring" has been deleted. Substituting "exposed" in place of "open wiring" would imply that ITC cable could not be concealed in the wall, ceiling, or floor, based on the definition. Open wiring, in this case, is permitted where the individual conductors are enclosed in metallic sheaths, etc. and not just run as open conductors.

No substantiation has been provided for deleting the 50 foot dimension and requiring continuous support in (5). No substantiation has been provided for deleting the 50 foot dimension in (6). The proposed changes adding the phrases "the utilization" and "or device" which are more restrictive have not been substantiated.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-222 Log #2935 NEC-P03 **Final Action: Accept in Part**
(727-4(6))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Revise 727.4(6) as follows:

(6) ~~As open wiring between cable tray and equipment~~ in lengths not to exceed 15 m (50 ft), where the cable complies with the crush and impact requirements of Type MC cable and is identified for such sue. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

Substantiation:

ITC has been allowed between the cable tray and equipment for two code cycles now without problems. Manufacturers are producing cables with superior crush and impact resistance capabilities. Proof of this is the ability of cable manufacturers to meet the requirements of 727.4(6) for other types of nonmetallic sheathed cables. This cable should now be allowed to run between two pieces of equipment versus just the equipment and cable tray. This proposal is also submitted in conjunction with other proposals to remove the term "open wiring". The term "open wiring" has lead to some confusion in the field.

Panel Meeting Action: Accept in Part

Accept the deletion of the three words "as open wiring" in (6), capitalize the "B" in the word "between" and reject the remainder of the Proposal.

Panel Statement:

The submitter has not provided any technical substantiation to expand permission for the use of this cable to all applications. Permission for the 50-foot length from the cable tray to the equipment was an attempt to provide an installer/user to not be required to enclose the cable in a raceway or similar enclosure but for a very limited application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-223 Log #122 NEC-P03 (760) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the action on this proposal is modified by proposals 3-131, 3-167, 3-173, 3-212, 3-214, 3-234, 3-236, 3-243, 3-244, 3-245, 3-247, 3-249, 3-253, 3-255, 3-256, 3-258, 3-260, 3-264a, 3-273, 3-275, 3-277, 3-280, 3-283, 3-286, 3-298, 3-299.

The Technical Correlating Committee directs the chairs of Code-Making Panels 3 and 16 to establish a small task group to consider the sequential numbering proposed by this and similar proposals. With the numbering as accepted, the addition of a new rule to any article would result in renumbering everything following that section. The task group should consider using a larger range of numbers to allow for future expansion of the articles. The task group can develop comments to accomplish this numbering.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber the sections within Articles 725, 760, 770, 800, 820 & 830 as shown on the following table. For information, the following are pro forma rewrites of the Articles assuming that the individual proposals are accepted.

[Recommendation of Proposal 3-223 is shown on page 2165]

Insert Table Here

(Table shown on page 2716)

Insert Artwork (760.61) Here

Insert Table 760.61 Here

(Table shown on page 2716)

Substantiation:

Section 2.4.1 of the 2001 National Electrical Code Style Manual states:

2.4.1 Parallel Numbering Within Similar Articles. To the extent possible, Code-Making Panels are encouraged to use the same section numbers (and part numbers, where applicable) for the same purposes within articles covering similar subjects.

The CMP 16 Editorial Task Group has prepared a series of proposals such that these Articles conform with the intent of the Style Manual. The Task Group includes myself, S. Egesdal, S. Kaufman, S. Johnson, J. Brunssen, G. Dorna, D. Pirkle and M. Wierenga. Work was undertaken after consultation with the TCC chairman.

Panel Meeting Action: Accept in Principle

Revise as follows:

[Text of Proposal 3-223 panel action is shown on page 2165]

Panel Statement:

The recommendation of this proposal includes a draft document in which the title numbers were changed to a parallel numbering sequence with 725, 770, 800, 820, and 830. The spreadsheet included after the draft was provided to assist in tracking the section number changes for each article and to provide the suggested title changes. The spreadsheet was not intended to be a part of the recommendation.

The internal text within each section was not changed so acceptance of this proposal is not intended to indicate the text within the section won't be changed by the action on another proposal.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

SANDERS: Accept in Principle with an affirmative comment the Draft proposals under this ROP for renumbering Article 760 as submitted by CMP 16 and amended by Panel Actions except for the following, based upon the proposed numbering sequence as submitted by CMP 16 TG.

Retain the present text of 760.30(B)(1) and 760.30(B)(2), and accept only that part of ROP 3-243 for a new FPN to present 760.30(B)(2) Exception which will provide a reference to NFPA 90A-2002.

Reject the proposed new 760.31(C) and FPN.

Retain existing 760.31(C), but delete redundant text in the first sentence as follows:

"(C) Type NPLFP. Type NPLFP non-power-limited fire alarm cable ~~for use in other space used for environmental air~~ shall be listed as being suitable for use in other space used for environmental air as described in 300.22(C) and shall be listed as having adequate fire-resistant and low smoke-producing characteristics."

The existing FPN as amended by Panel Action on ROP 3-253 to add a new last sentence to present 760.31(C) FPN should be accepted.

Reject the addition of "NPLFD-CI" to 760.31(G) second sentence parenthetical text.

The present use of the word "adequate" in the existing 760.31(C) and proposed 760.82(E) text is intended to provide the necessary guidance for evaluating and listing of products used in spaces that are not specifically fabricated for transporting environmental air. It is always possible to employ more stringent installation methods than the minimum provided for in the NEC.

By retaining the existing text for type NPLFP in the reidentified 760.31(D) with its specific reference to 300.22(C) for information as to the type of "other space used for environmental air" for which it can be used, and not including this reference in the proposed text to be added to 760.31(C), leaves the impression that some other category might be involved.

Retain the present text in Table 760.61.

Reject ROP 3-286 proposed new 760.82(D) and FPN. Accept ROP 3-286 addition of the FPN new last sentence of Proposed 760.82(E).

This change to provide additional cable designators was predicated upon CMP 03 accepting several ROPs affecting 300.22, which were rejected due to lack of documentation that additional subcategories of "other space used for environmental air" were necessary. [See

Proposals 3-89 (Log #1727), 3-90 (Log #1728), 3-91 (Log #299), 3-92 (Log #1220a) and 3-94 (Log #446)].

At present there are two types of environmental air handling mechanisms in 300.22(B) (i.e., ducts, or plenums specifically fabricated to transport environmental air). In addition a third type is provided for in 300.22(C) for other spaces that are not of the duct variety or that does not meet the condition of being specifically fabricated, such as blower rooms, above room ceiling spaces or below floor cavities. Below floor cavities may also have to meet the requirements of Article 645, which can and does set additional conditions on wiring methods permitted under raised floors for Information Technology equipment.

Lacking this documentation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why an additional marking category "D" is necessary, and why the existing type FPLP is no longer suitable for use in any of the air handling space included in 300.22, Parts (A), (B) or (C), or why NPLFP are no longer suitable for use in the air handling space included in 300.22(C) not otherwise covered in 300.22(A) [ducts for transporting materials that may create an explosive hazard] and (B) [ducts or plenums specifically fabricated for the transportation of environmental air].

The proposed text of ROP 3-286 for 760.82(D) and its FPN should not be accepted, since there is no need for the proposed text based on the present understanding of the general text found in the NEC.

3-224 Log #2569 NEC-P03 **Final Action: Reject**
(760)

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a FPN immediately after the title, as shown:
ARTICLE 760 Fire Alarm Systems
FPN: Rules that are followed by a reference to [NFPA 72, xxx] in brackets contain text that has been extracted from NFPA 72-2002, *National Fire Alarm Code* (xxx represents the specific sections of that document referenced). Only editorial changes were made to the extracted text to make it consistent with this code.

Substantiation:

This proposal is a companion to proposals to 760.25 and 760.52, where text is being extracted from another NFPA Standard.
The proposed text complies with the 2001 NEC Style Manual, paragraph 4.3.

Panel Meeting Action: Reject

Panel Statement:

There is no extracted material from NFPA 72 so the FPN is unnecesary.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-240 (Log #2557). Additionally, the Panel statement should have indicated the Panel Action to reject was due to the rejection of Proposals 3-240 and 3-259, which included extracted text.

3-225 Log #1661 NEC-P03 **Final Action: Reject**
(760-2)

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to CI cable in the Code. Specifically delete:

~~760.2 Definitions.~~

~~Fire Alarm Circuit Integrity (CI) cable in the Code. Cable used in fire alarm systems to ensure continued operation of critical circuits during a specified time under fire conditions.~~

~~760.31(F) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 760.31(C), (D), and (E) that meet the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, NPLFP-CI, and NPLF-CI).~~

~~FPN No. 1: This cable may be used for fire alarm circuits to comply with the survivability requirements of NFPA 72-1999, National Fire Alarm Code®, 3-4.2.2.2, 3-8.4.1.1.4, and 3-8.4.1.3.3.3(3), that the cable maintain its electrical function during fire conditions for a defined period of time.~~

~~FPN No. 2: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistive Cables.~~

760.31(G) NPLFA Cable Markings. Multiconductor non-power-limited fire alarm cables shall be marked in accordance with Table 760.31(G). Non-power-limited fire alarm circuit cables shall be permitted to be marked with a maximum usage voltage rating of 150 volts. ~~Cables that are listed for circuit integrity shall be identified with the suffix "CI" as defined in 760.31(F).~~

Table 760.31(G) NPLFA Cable Marking ~~Note: Cables identified in 760.31(C), (D), and (E) and meeting the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, NPLFP-CI, NPLFR-CI, and NPLF-CI).~~

~~760.71(G) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 760.71(D), (E), and (F) that meet the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, FPLP-CI, FPLR-CI, and FPL-CI).~~

~~FPN No. 1: This cable is used for fire alarm circuits as one method of complying with the survivability requirements of NFPA 72-1999, National Fire Alarm Code, 3-4.2.2.2, 3-8.4.1.1.4, and 3-8.4.1.3.3.3(3), that the cable maintain its electrical function during fire conditions for a defined period of time.~~

~~FPN No. 2: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistive Cables.~~

760.71(I) Cable Marking. The cable shall be marked in accordance with Table 760.71(I). The voltage rating shall not be marked on the cable. ~~Cables that are listed for circuit integrity shall be identified with the suffix CI as defined in 760.71(G).~~

~~Table 760.71(I) Note: Cables identified in (D), (E), and (F) meeting the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, FPLP-CI, FPLR-CI, and FPL-CI).~~

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

There are no requirements or specifications for the use of CI cable versus the general fire alarm cable already specified. Consequently CMP 3 is obliged to follow the TCC directive and accept this proposal.

We believe that CI cables should be permitted to continue to be in the NEC. We recommend that CMP 3 accept this proposal with a request to the TCC that it reconsider its position on inclusion of products that do not have specific application rules in the NEC.

CI cable could be retained if the TCC would change its position as follows:

The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC unless inclusion in the NEC is for purposes of correlating with other codes.

Panel Meeting Action: Reject

Panel Statement:

See the Panel Action on Proposals 3-273 to 3-278. Insertion of this wiring method into 760.61 effectively provides an application for these cables, making deletion of the wiring method unnecessary. It also provides a method of complying with the requirement in Section 6.9.4.3 and 6.9.4.6 of NFPA 72 for a 2-hour rated cable for survivability from attack by fire.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-226 Log #1792 NEC-P03 **Final Action: Reject**
(760-2)

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Add to 760.2 as follows, after the last paragraph.
Other cable constructions:
Type MI fire alarm cable, bare or with an approved jacket suitable for plenum rating, is an MI cable suitable for use in fire alarm systems.

Substantiation:

Mineral Insulated twisted pair fire alarm cable (MI) has been used successfully around the world for years. MI fire alarm cables are UL listed as such.
Article 760 limits it to FPL and NPLF types, which are constructed to UL 1424 and 1425, and refer only to polymeric cable constructions. As a result, MI cable is not strictly recognized for use as a FA cable. Article 760 has "CI" cables and FPL/NPLF so interwoven that other constructions such as MI, which is inherently suitable, is currently excluded. By including MI cable in 760.61, this exclusion will be remedied.
Note: Supporting material is available for review at NFPA headquarters.

Panel Meeting Action: Reject

Panel Statement:

See the panel statement on 3-281.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-227 Log #61a NEC-P03 **Final Action: Accept in Principle**
(760-3)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete "Locations and" from the title of these sections to make the section titles "Other Articles."

Substantiation:

The current titles are not in agreement with the 2001 National Electrical Code Style Manual sections 2.5 and 3.3.5.
In the 2002 NEC, the following sections all have the title "Other Articles": 225.2; 372.3; 402.2; 445.3; 500.3; 505.3; 518.3; 545.2; 547.3; 604.3; 650.2; 668.3; 705.2 and 720.2.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action for Section 760.3 in Proposal 3-223 that accomplishes the proposed action.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-228 Log #1747 NEC-P03 (760-3) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:
760.3 Locations and Other Articles.
Circuits and equipment shall comply with 760.3(A) through (F). Only those sections of Article 300 referenced in this article shall apply to fire alarm systems.
(A) Spread of Fire or Products of Combustion. Section 300.21. The accessible portion of abandoned fire alarm cables shall not be permitted to remain.
(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22, for non-power-limited and power-limited alarm circuits ~~where~~ installed in ducts or plenums or other ~~spaces used for environmental air~~ air-handling spaces. Type NPLFP and FPLP cables shall be permitted for non-power-limited and power-limited fire alarm circuits installed in plenums, including ceiling cavity plenums and raised floor plenums. Wiring methods installed in a plenum space shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the plenum space.
Exception: As permitted in 760.30(B)(1) and (2) and 760.61(A).
(C) Hazardous (Classified) Locations. Articles 500 through 516 and Article 517, Part IV, where installed in hazardous (classified) locations.
(D) Corrosive, Damp, or Wet Locations. Sections 110.11, 300.6, and 310.9 where installed in corrosive, damp, or wet locations.
(E) Building Control Circuits. Article 725 where building control circuits (e.g., elevator capture, fan shutdown) are associated with the fire alarm system.
(F) Optical Fiber Cables. Where optical fiber cables are utilized for fire alarm circuits, the cables shall be installed in accordance with Article 770.

Substantiation:

[Text of Proposal 3-228 substantiation is shown on page 2172]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-229 Log #62d NEC-P03 (760-5) **Final Action: Accept in Principle in Part**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.
Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.
Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".
Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

The proposed changes to Article 760 are incorporated into the actions in Proposal 3-223 as follows: Accept the proposed recommendation to change 760.5 to 760.7, 760.6 to 760.8, and 760.7 to 760.11. Reject the remainder of the proposal.

Panel Statement:

The proposed changes to Article 760 are incorporated into the actions in Proposal 3-223. The proposed actions on Article 725 have been addressed in subsequent proposals. The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-230 Log #860 NEC-P03 **Final Action: Reject**
(760-5)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 760.5 as follows:

760.5 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an excess accumulation of wires and cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 725.5 has been misinterpreted to mean that wires and cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when 725.5 was introduced into the 1993 NEC. At that time CMP 16 stated in response to a proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of wires and cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited wire and cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of wire and cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 640.5, 725.5, 770.7, 800.5, 820.5, and 830.6.

Panel Meeting Action: Reject

Panel Statement:

The interpretation included in the submitters substantiation stating, "cables may not be placed directly on suspended ceilings" only proves that the section as written is clear in its intent. The submitter's proposed addition of the terms "excess " and "sufficient" are vague, and not in accordance with 3.2.1 "unenforceable terms" of the NEC Style Manual.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-231 Log #62e NEC-P03 **Final Action: Accept in Principle in Part**
(760-6)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See the Panel Action and Statement on Proposal 3-229.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-232 Log #856 NEC-P03 **Final Action: Reject**
(760-6)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 760.6 as follows:

760.6 Mechanical Execution of Work. Fire alarm circuits shall be installed in a neat and workmanlike manner. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by ~~structural components of~~ the building structure in such a manner that the cable or conductors will not be damaged by normal building use. Such cables and conductors shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable and conductors. The installation shall also conform with 300.4 (D).

Substantiation:

Section 760.6 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (760.6). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables. It also makes "ceiling" plural and adds "and conductors" in two locations for consistency. This is a companion proposal and is intended to correlate with similar proposals for 800.6, 820.6, 830.7, 640.6, 725.6, and 770.8.

Panel Meeting Action: Reject

Panel Statement:

It is not the intent to limit or eliminate fastening cables and conductors onto baseboards and walls but these cables and conductors should not be supported by building components that will be affected by the weight or substance of the cables. Section 110.2 requires approval of all electrical equipment and conductors installed in accordance with the NEC. The AHJ can and should be able to make the determination whether the cables or conductors are sufficiently supported.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-233 Log #2741 NEC-P03 **Final Action: Reject**
(760-6)

Submitter: Christopher R. Pharo, IBEW-ECAG

Recommendation:

Add a sentence after the first sentence to revise 760.6 to read as follows:

760.6 Mechanical Execution of Work. Fire alarm circuits shall be installed in a neat and workmanlike manner. Cables shall be supported from the building structure every 1.8m (6 ft.) and 300 mm (12 in.) from a box or cabinet. Cables...

Substantiation:

This article governs fire alarm systems. There are currently no guidelines for distances between supports for the type of cabling used in this article. The supports can be spaced 5 ft., 50 ft., or 100 ft. - it doesn't matter because the code doesn't address it. The life safety system, as it stands now, can be supported from every fourth, fifth, sixth, etc bar joists. It is between these supports that other vendors come in and install their Article 725 and Article 800 cabling - on top of the life safety system cabling. This makes future installs next to impossible and in the event of an emergency, firefighters may have to wrestle their way through the jungle of poorly, insufficiently, supported cabling.

All other areas of the code dictate minimum distances between supports. Why is it not dictated here in the fire alarm section and perhaps the most important article of the code. How can the inspector have the authority to ask a contractor to support the fire alarm cabling better when he doesn't have the code to back him up.

Panel Meeting Action: Reject

Panel Statement:

There has been no technical information provided in the substantiation, other than suppositions, that these cables must be supported every 6 feet and within 12 inches of a box or cabinet. The support of this cable should be based upon the size of the cable. Other wiring methods from Chapter 3 must follow the support requirements in that particular wiring method article.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-165 (Log #2472).

3-234 Log #2610 NEC-P03 **Final Action: Accept in Principle**
(760-6, FPN (New))

Submitter: H. Brooke Stauffer, Nat'l Electrical Contractors Assn. (NECA)

Recommendation:

Add a new fine print note as follows:
FPN: Accepted industry practices are described in ANSI/NECA 305-2001, Standard for Fire Alarm System Job Practices, and other ANSI-approved installation standards.

Substantiation:

As presently written, 760.6 describes only a few of the important aspects of "neat and workmanlike" fire alarm installations. Safety would be improved by providing an informational reference to a more comprehensive standard on the subject.

Panel Meeting Action: Accept in Principle

Revise the text as follows:
FPN: A source of information describing industry practices can be found in ANSI/NECA 305-2001, Standard for Fire Alarm System Job Practices.

Panel Statement:

The panel modified the proposed FPN text to indicate that other sources for industry practices may be available.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

AYER: The ANSI standard is one of many standards or publications used for the installation of Fire Alarm Systems. Far more individuals use publications from NEMA, NFPA 72, Simplex, Notifier, EST, etc., than by using the ANSI Standard. By isolating ANSI in the Fine Print Note, the designers may limit themselves from looking at other far better sources of information.

3-235 Log #62f NEC-P03 **Final Action: Accept in Principle in Part**
(760-7)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.
Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.
Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".
Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept in Principle in Part

Panel Statement:

See the Panel Action and Statement on Proposal 3-229.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-236 Log #1598 NEC-P03 (760-21) **Final Action: Accept**

TCC Action:

The Technical Correlating Committee notes that Code-Making Panel 3 has responsibility for fire alarm circuits and the respective power sources as indicated in Article 760. The issue of smoke alarms connected to branch circuits as described in the submitter's substantiation is under the responsibility of Code-Making Panel 2 in Article 210.

Submitter: Joseph A. Ross, Ross Seminars

Recommendation:

Revise the last sentence of 760.21 as follows:
These circuits shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

Substantiation:

Many installers feel reluctant to adversely compromise the integrity of fire and smoke warning systems by supplying them from circuits that are provided with AFCIs, specifically bedroom circuits, as some national organizations have implied.

Many electrical inspectors are reluctant to be responsible for a mandate to require a smoke detector circuit that enters a bedroom for approximately three feet to be provided with an AFCI and at the same time not require AFCI protection for circuits of approximately 500 ft (average 35 circuits/@ 15 ft) that are connected to a panelboard located in a bedroom. Forty-circuit service or feeder panelboards are commonly located in bedrooms of dwelling units, mobile homes, and manufactured homes.

At a recent IAEI Conference where representatives of eleven states participated, a consensus could not be reached. To AFCI or not to AFCI a smoke detector circuit, that is the question.

Of the eight states that were surveyed, no two states were in agreement: one state was receptacles only; one was wait and see; one was no smoke detectors; one was smoke detectors; others left the decision to local municipalities for varied opinions.

Confusing? One state amended 210.12. Then amended the amendment. And is now in the process to interpret the amendment to the amendment to 210.12.

NOTE: This AFCI and/or Smoke Detector confusion has become one of the most controversial issues of both the 1999 and the 2002 NECs and it is interesting to point out that neither the NEC Handbook nor the IAEI/NFPA Analysis addresses any comment to the application of smoke detectors supplied through an AFCI circuit.

Consider the following:

1. The literal wording of 210.12 does not include smoke detectors (SD). (SDs are not rated 125-volt) (See UL "White" book, Pages 5 and 6).
2. The intent of CMP 2 when they wrote the rule does not include SDs. (Well before ROC No. 2-77 and the rule was not rewritten.)
3. Has UL evaluated or tested SDs on AFCI circuits? I think not.
4. Many electrical inspectors use a GFCI (5mA) tester for AFCIs. (And trip some models of them.)
5. CMP 16 nixed SDs on sensitive GFCI circuits. (CMP 16 did not get the chance to address SDs on sensitive AFCI circuits.) GFCIs have a 30-year track record with the NEC. AFCIs didn't have a 30-day track record with the NEC.
6. Smoke Detectors for new installations are, generally, provided with a battery back-up feature, but national statistics indicate that the majority of SDs are (1) not provided with batteries, (2) the batteries are missing, (3) the batteries are dead, or (4) the SDs are rendered inoperable by, e.g., a shower cap.

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

3-237 Log #2324 NEC-P03 (760-21) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the table included with the proposal is unrelated to the Recommendation.

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

Recommendation:

Revise 760.21 as follows:
760.21 NPLFA Circuit Power Source Requirements. The power source of non-power-limited fire alarm circuits shall comply with Chapters 1 through 4, and the output voltage shall not be more than 600 volts, nominal. These circuits shall not be supplied through ground-fault circuit-interrupters. These circuits shall not be supplied through arc-fault circuit-interrupters.
FPN: See 210.8(A)(5), Exception No. 3 for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

Substantiation:

A home fire alarm system is required to have 24 hours of standby power. If an arc disconnects power from the fire alarm system, the system will cease to function after 24 hours with no indication of the loss of power. Also, there are smoke alarms powered by 120 VAC with no battery back-up.

Insert Table Log 2324*

(Table shown on page 2716)

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel action on Proposal 3-236.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-238 Log #2556 NEC-P03 (760-21) **Final Action: Accept in Principle**

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise 760.21 as follows:
760.21 NPLFA Circuit Power Source Requirements. The power source of non–power-limited fire alarm circuits shall comply with Chapters 1 through 4, and the output voltage shall not be more than 600 volts, nominal. These circuits shall not be supplied through ground-fault circuit-interrupters. These circuits shall not be supplied through arc-fault circuit-interrupters.
FPN: See 210.8(A)(5), Exception No. 3 for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

Substantiation:

A home fire alarm system is required to have 24 hours of standby power. If an arc disconnects power from the fire alarm system, the system will cease to function after 24 hours with no indication of the loss of power. Also, there are smoke alarms powered by 120 VAC with no battery back-up.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel action on Proposal 3-236.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-239 Log #1008 NEC-P03 (760-25) **Final Action: Reject**

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Change the reference in this section from 300.11(A) to 300.11.

Substantiation:

As presently worded, it seems that NPLFA wiring is permitted to be supported from raceways or from other cables because of the obvious omission of a reference to 300.11(B) and (C). If the NPLFA wiring is installed in a raceway, that raceway would be permitted to be supported from a power raceway since Article 760 is given the authority to modify Article 300. Certainly, other arguments could be made as to the applicability of 300.11 to the power raceway, but there is no reason why fire alarm wiring should be able to be installed by attachment to other raceways or cables and Article 760 should be clear on this point.

Panel Meeting Action: Reject

Panel Statement:

Section 760.6 "Mechanical Execution of Work" requires fire alarm circuits to be supported by structural components of the building.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-240 Log #2557 NEC-P03 (760-25) **Final Action: Reject**

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise 760.25 as shown:

760.25 NPLFA Circuit Wiring Methods. Installation of non-power-limited fire alarm circuits shall be in accordance with (A). Installation of Class A, non-power-limited fire alarm circuits shall be in accordance with (A) and (B).

(A) Installation of non–power-limited fire alarm circuits shall be in accordance with 110.3(B), 300.11(A), 300.15, 300.17, and other appropriate articles of Chapter 3.

Exception No. 1: As provided in 760.26 through 760.30.

Exception No. 2: Where other articles of this Code require other methods.

(B) Class A Circuits. All styles of Class A circuits using physical conductors (for example, metallic, optical fiber) shall be installed such that the outgoing and return conductors, exiting from and returning to the control unit, respectively, are routed separately. The outgoing and return (redundant) circuit conductors shall not be run in the same cable assembly (that is, multiconductor cable), enclosure, or raceway.

Exception: The outgoing and return (redundant) circuit conductors shall be permitted to be run in the same cable assembly, enclosure, or raceway under any of the following conditions:

(a) For a distance not to exceed 3 m (10 ft) where the outgoing and return conductors enter or exit the initiating device, notification appliance, or control unit enclosures.

(b) Where looped conduit/raceway systems are provided, single conduit/raceway drops to individual devices or appliances.

(c) Single conduit/raceway drops to multiple devices or appliances installed within a single room not exceeding 92.9 m2 (1000 ft2) in area. [NFPA 72, 6.4.2.2.2]

FPN: A goal of 3-4.2.2.2 is to provide adequate separation between the outgoing and return cables. This separation is required to help ensure protection of the cables from physical damage. The recommended minimum separation to prevent physical damage is 1 ft (0.305 m) where the cable is installed vertically and 4 ft (1.22 m) where the cable is installed horizontally. [NFPA 72, A.6.4.2.2.2]

Substantiation:

Wiring requirements for fire alarm systems moved from the NFPA 72 Standards to the 1975 NEC, Article 760. During the intervening years, new wiring requirements crept back into the NFPA 72. This proposal provides users of the NEC information necessary to design, install, inspect and service Class A fire alarm system circuits.

The proposed text complies with the 2001 NEC Style Manual, paragraph 4.3.

4.3 Extracts.

4.3.1 Extracting Material from an NFPA Document and Including It in the *NEC*. Extracting provides an advantage over multiple references to requirements contained within other NFPA documents. Extracting has the disadvantage of creating a situation where the text of the source document and the user document are not identical due to different revision cycles.

4.3.2 Extract Requirements. To extract material from another NFPA document, the following requirements shall be met.

4.3.2.1 Reason. There shall be a specific technical reason for the extract.

4.3.2.2 Context. A section or paragraph being extracted from another document shall represent a complete thought and shall be entirely extracted. The context of the original material shall not be compromised or violated. Any editing of the extracted text shall be confined to making the style consistent with that of the *NEC* and then only with the concurrence of the committee having primary jurisdiction. Such concurrence shall be obtained through the staff liaison for the source document.

4.3.2.3 Identification. The number, title, and edition of the NFPA document from which the extract is taken shall appear at the beginning of the article in which the extract is used. The document number and paragraph from which the extract is taken shall appear in brackets at the end of the section in which the extract is used.

Panel Meeting Action: Reject

Panel Statement:

The class of the fire alarm system will determine the installation requirements for each different style of fire alarm circuit. Initiating device circuits, notification appliance circuits, and signaling line circuits can be designated as Class A or Class B, depending upon their performance during non-simultaneous single circuit fault conditions. There are too many different conditions and details contained within NFPA 72 to extract the information and insert it into the NEC. The installer must have a total understanding of all of these issues before attempting the installation. Extracting some of the information into the NEC and not the remainder will not provide the installer with the required information to install the system and will cause confusion.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

EGESDAL: There should be text in the NEC to alert designers, installers, and inspectors to unique installation requirements for Class A circuits in NFPA 72-2002. Extracted text may not be the best way to accomplish the goal. Hopefully, the National Fire Alarm Code TCC will submit a comment to clarify needed text. Additionally, the proposal is rather straight forward, describing the installation requirements for a Class A circuit. Much of the Panel Statement is irrelevant to the physical separation requirements in the proposal.

3-242 Log #1748 NEC-P03 (760-30) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

760.30 Multiconductor NPLFA Cables.

Multiconductor non–power-limited fire alarm cables that meet the requirements of 760.31 shall be permitted to be used on fire alarm circuits operating at 150 volts or less and shall be installed in accordance with 760.30(A) and (B) or where cable substitutions are made as shown in 760.61(D) .

(Section 760.30 (A) to stay unchanged)

(B) Applications of Listed NPLFA Cables. The use of non–power-limited fire alarm circuit cables shall comply with 760.30(B)(1) through (B)(4).

(1) Ducts ~~and Plenums~~ or Other Spaces Used for Environmental Air (Other than Plenums, Including Ceiling Cavity Plenums and Raised Floor Plenums). Multiconductor non–power-limited fire alarm circuit cables, Types NPLFP, NPLFR, and NPLF, shall not be installed exposed in ducts or other spaces used for environmental air (other than plenums, including ceiling cavity plenums and raised floor plenums) ~~or plenums~~ .

FPN: See 300.22(B).

(2) ~~Other Spaces Used for Environmental Air~~ Plenums, Including Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~other spaces used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, shall be listed wires and cables installed in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type NPLFP. The accessible portion of abandoned multiconductor non–power-limited fire alarm cables shall not be permitted to remain.

~~Exception No. 1: Types NPLFR and NPLF cables installed in compliance with 300.22 (C).~~

Exception No. 2: Other wiring methods in accordance with 300.22 (C) and conductors in compliance with 760.27 (C).

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 3-242 substantiation is shown on page 2182]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Additionally, Section 760.30(B)(1) does not permit Type NPLFP cable to be installed in ducts and plenums, but does permit Type NPLFP to be installed in "other spaces used for Environmental air" [Section 760.30(B)(2)].

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-243 Log #2558 NEC-P03 (760-30) **Final Action: Accept in Part**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 760.30 as shown below.

760.30 Multiconductor NPLFA Cables. Multiconductor non–power-limited fire alarm cables that meet the requirements of 760.31 shall be permitted to be used on fire alarm circuits operating at 150 volts or less and shall be installed in accordance with 760.30(A) and (B).

760.30(A) [No change]

(B) Applications of Listed NPLFA Cables. The use of non–power-limited fire alarm circuit cables shall comply with 760.30(B)(1) through (B)(4).

(1) Ducts and Plenums. Multiconductor non–power-limited fire alarm circuit cables, Types NPLFD, NPLFP, NPLFR, and NPLF, shall not be installed exposed in ducts or plenums, other than ceiling cavity plenums and raised floor plenums.

FPN: See 300.22(B).

(2) Ceiling Cavity Plenums and Raised Floor Plenums. ~~Other Spaces Used for Environmental Air.~~ Cables installed in ceiling cavity plenums and raised floor plenums ~~other spaces used for environmental air~~ shall be Type NPLFD or Type NPLFP.

Exception No. 1: Types NPLFR and NPLF cables installed in compliance with 300.22(C).

Exception No. 2: Other wiring methods in accordance with 300.22(C) and conductors in compliance with 760.27(C).

FPN: Plenums described in NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

760.30(B)(3) Riser. [No change]

760.30(B) (4) Other Wiring Within Buildings. [No change]

Substantiation:

[Text of Proposal 3-243 substantiation is shown on page 2190]

Panel Meeting Action: Accept in Part

Accept the addition of "NPLFD" in two locations and reject the remainder of the Proposal.

[Text of Proposal 3-243 panel action is shown on page 2192]

Panel Statement:

See the Panel Action on Proposal 3-223 include file for the incorporation of this text change. The phrase "ducts, plenums, and other spaces for environmental air" was retained since the phrase "ceiling cavity plenums and raised floor plenums" are not recognized in the NEC. The FPN was not accepted since there is nothing in Section 760.30 that requires a reference back to NFPA 90A.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 8 Negative: 4

Explanation of Negative:

CASPARRO: This proposal should be rejected. Acceptance of this proposal in Part as modified by Panel 3 does not provide a specific application for this cable type. The NEC is not a product catalog nor is it a design manual and is not intended to contain an all-inclusive list of permitted products.

EASTER: See my Explanation of Negative Vote on Proposal 3-169.

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

SANDERS: Reject proposed changes to present 760.30(B)(1) and 760.30(B)(2).

While there is no problem with adding the suggested reference to 300.21 in the proposed FPN to 760.30(B)(2) Exception No. 2, a straight reject was selected for ROP 3-243 because of the multiple issues addressed by this one ROP. A comment will be made to bring back in December 2003 for CMP 03 ROC consideration this FPN sentence for review. If accepted at that time, it will provide users with a reminder of the location for basic requirements contained within 300.21.

This change to provide additional cable designators was predicated upon CMP 03 accepting several ROPs affecting 300.22, which were rejected due to lack of documentation that additional subcategories of "other space used for environmental air" were necessary. [See Proposals 3-89 (Log #1727), 3-90 (Log #1728), 3-91 (Log #299), 3-92 (Log #1220a) and 3-94 (Log #446)].

At present there are two types of environmental air handling mechanisms in 300.22(B) (i.e., ducts, or plenums specifically fabricated to transport environmental air). In addition, a third type is provided for in 300.22(C) for other spaces that are not of the duct variety or that does not meet the condition of being specifically fabricated, such as blower rooms, above room ceiling spaces or below floor cavities. Below floor cavities may also have to meet the requirements of Article 645, which can and does set additional conditions on wiring methods permitted under raised floors for Information Technology equipment.

Lacking this documentation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the existing type NPLFP, NPLFR, and NPLF cables are not suitable for use in the environmental air handling spaces included in 300.22(B), used in conjunction with 760.30(B)(1), or 300.22(C) used in conjunction with 760.30(B)(2).

Note that it is always possible to employ more stringent installation methods not specifically mentioned in the NEC.

Comment on Affirmative:

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-241 Log #65 NEC-P03 **Final Action: Accept in Principle**
(760-30, 760.31, 760.52(B), 760.71, 760.81(new) & 760.82(new))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

[Recommendation of Proposal 3-241 is shown on page 2181]

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the ends of Articles 725, 760, 770, 800, 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and Fire Alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible.

Panel Meeting Action: Accept in Principle

Accept the recommendations in the proposal as already incorporated into the final draft of Proposal 3-223.

Panel Statement:

The proposed changes to Article 760 are incorporated into the actions in Proposal 3-223. The change in 760.52 to renumber "760.71" to "760.82" has been incorporated into 760.52(B).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-244 Log #1004 NEC-P03 **Final Action: Accept**
(760-30(A)(3))

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Change "liquid flexible nonmetallic tubing" to "liquidtight flexible nonmetallic conduit."

Substantiation:

Although the proposal (ROP 16-125) referred to liquidtight flexible nonmetallic tubing (LFMT?), the substantiation talked about liquidtight flexible nonmetallic conduit (LFMC). Since LFMT is not mentioned elsewhere in the code, this should be changed to permit the use of something that does exist.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-245 Log #2430 NEC-P03 **Final Action: Accept in Principle**
(760-30(B)(2) Exception No. 3 (New))

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Add a new exception as follows:
Exception No. 3: Type NPLFP-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on Comment 16-98 for the 2002 NEC overturned CMP 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified."... "The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

Type NPLFP-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Insert the word "Cable" after "NPLFP-CI."
Delete the word"rating" and replace with "rated cable."
This is an editorial clarification.

Panel Statement:

This is an editorial clarification.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-246 Log #2559 NEC-P03 **Final Action: Accept in Principle**
(760-30(B)(2) Exception No. 3 (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a new Exception as follows:
Exception No. 3. Type NPLFP-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable *"because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." …."The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."*

Type NPLFP-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposal 3-245.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-247 Log #2431 NEC-P03 **Final Action: Accept in Principle**
(760-30(B)(3) Exception No. 3 (New))

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Add a new exception as follows:
Exception No. 3: Type NPLFR-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on Comment 16-98 for the 2002 NEC overturned CMP 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified."... "The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

Type NPLFR-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Insert the word "Cable" after "NPLFR-CI."
Delete the word"rating" and replace with "rated cable."

Panel Statement:

This is an editorial clarification.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-248 Log #2560 NEC-P03 **Final Action: Accept in Principle**
(760-30(B)(3) Exception No. 3 (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a new Exception as follows:
Exception No. 3. Type NPLFR-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable *"because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." …."The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."*

Type NPLFR-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposal 3-247.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-249 Log #2432 NEC-P03 **Final Action: Accept in Principle**
(760-30(B)(4) Exception No. 3 (New))

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Add a new exception as follows:
Exception No. 3: Type NPLF-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on Comment 16-98 for the 2002 NEC overturned CMP 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified."... "The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

Type NPLF-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Insert the word "Cable" after "NPLF-CI."
Delete the word"rating" and replace with "rated cable."

Panel Statement:

This is an editorial clarification.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-250 Log #2561 NEC-P03 **Final Action: Accept in Principle**
(760-30(B)(4) Exception No. 3 (New))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a new Exception as follows:
Exception No. 3. Type NPLF-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable *"because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." …."The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."*

Type NPLF-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposal 3-249.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-251 Log #1749 NEC-P03 (760-31) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

760.31 Listing and Marking of NPLFA Cables.

Non–power-limited fire alarm cables installed as wiring within buildings shall be listed in accordance with 760.31(A) and (B) and as being resistant to the spread of fire in accordance with 760.31(C) through (F), and shall be marked in accordance with 760.31(G).

(A) NPLFA Conductor Materials. Conductors shall be 18 AWG or larger solid or stranded copper.

(B) Insulated Conductors. Insulated conductors shall be suitable for 600 volts. Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.13 or one that is identified for this use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with 760.27.

(C) Type NPLFP. Type NPLFP non–power-limited fire alarm cable for use in other space used for environmental air shall be listed as being suitable for use ~~in other space used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(D) Type NPLFR. Type NPLFR non–power-limited fire alarm riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass ANSI/UL 1666-1997, Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts.

(E) Type NPLF. Type NPLF non–power-limited fire alarm cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of risers, ducts, plenums, including ceiling cavity plenums and raised floor plenums, ~~and other space used for environmental air~~ and shall also be listed as being resistant to the spread of fire.

FPN No. 1: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

FPN No. 2: Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

In Table 760.31(G): replace "Non–power-limited fire alarm circuit cable for use in other space used for environmental air" by "Non–power-limited fire alarm circuit cable for use in plenums"

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 3-251 substantiation is shown on page 2193]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Additionally, Section 760.30(B)(1) does not permit Type NPLFP cable to be installed in ducts and plenums, but does permit Type NPLFP to be installed in "other spaces used for Environmental air" [Section 760.30(B)(2)].

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-252 Log #2439 NEC-P03 **Final Action: Accept in Principle**
(760-31, 760.30 and Table 760.31 (G))

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

[Text of Proposal 3-252 recommendation is shown on page 2203]

Substantiation:

[Text of Proposal 3-252 substantiation is shown on page 2205]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement in Proposal 3-253 which addressed the submitters concerns.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-253 (Log #2562).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-253 Log #2562 NEC-P03Meeting Action: Accept in Principle in Part (760-31 and Table 760.31 (G)) **Final Action: Reject**

TCC Action: Reject

See Technical Correlating Committee Note on Proposal 3-89.

It was the action of the Technical Correlating Committee that this Proposal be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 760.31 as shown below. Sections 760.31(A), (B) do not change.

760.31 Listing and Marking of NPLFA Cables. Non–power-limited fire alarm cables installed as wiring within buildings shall be listed in accordance with 760.31(A) and (B) and as being resistant to the spread of fire in accordance with 760.31(C) through (GF), and shall be marked in accordance with 760.31(HG).

(A) NPLFA Conductor Materials. Conductors shall be 18 AWG or larger solid or stranded copper.

(B) Insulated Conductors. Insulated conductors shall be suitable for 600 volts. Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.13 or one that is identified for this use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with 760.27.

(C) Type NPLFD. Type NPLFD non-power-limited fire alarm duct cable shall be listed as being suitable for use in other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for materials installed in ducts and plenums.

(DC) Type NPLFP. Type NPLFP non–power-limited fire alarm cable for use in ceiling cavity plenums and raised floor plenums ~~other space used for environmental air~~ shall be listed as being suitable for use in ceiling cavity plenums and raised floor plenums ~~other space used for environmental air~~ as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for installation in ceiling cavity plenums and raised floor plenums.

Renumber 760.31(D) to 760.31(E)

Renumber 760.31(E) to 760.31(F)

(GF) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 760.31(C), (D), ~~and~~ (E), and (F) that meet the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, NPLFD-CI, NPLFP-CI, NPLFR-CI, and NPLF-CI).

FPN No. 1: This cable may be used for fire alarm circuits to comply with the survivability requirements of NFPA 72-1999, National Fire Alarm Code®, 3-4.2.2.2, 3-8.4.1.1.4, and 3-8.4.1.3.3.3(3), that the cable maintain its electrical function during fire conditions for a defined period of time.

FPN No. 2: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistive Cables.

(HG) NPLFA Cable Markings. Multiconductor non–power-limited fire alarm cables shall be marked in accordance with Table 760.31(HG). Non–power-limited fire alarm circuit cables shall be permitted to be marked with a maximum usage voltage rating of 150 volts. Cables that are listed for circuit integrity shall be identified with the suffix "CI" as defined in 760.31(GF).

INSERT Table 760.31 HERE

(Table shown on page 2717)

Substantiation:

[Text of Proposal 3-253 substantiation is shown on page 2208]

Panel Meeting Action: Accept in Principle in Part

Revise the text in 760.31 to read as follows:

[Text of Proposal 3-253 panel action is shown on page 2208]

Panel Statement:

The phrase "a limited fire hazard cable" was deleted from the recommended text since the NEC does not have a definition or explanation for limited fire hazard. The phrase "ducts, plenums, and other spaces for environmental air" was retained since the phrase "ceiling cavity

plenums and raised floor plenums" are not recognized in the NEC. See also the panel statement in Proposal 3-94. In Table 760.31 for cable marking, the phrase "ceiling cavity and raised floor plenum" must be deleted from cable marking identification NPLFA since this phrase is not recognized in the NEC.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 7 Negative: 5

Explanation of Negative:

AYER: Duct Cables have been submitted in this code cycle for use in Ducts and Plenums and as a substitution for cables in "Other spaces used for environmental air." Since Non-Power Limited Fire Alarm Cables are not permitted in these applications the Type "NPFLD" Cable would therefore have no application and should be rejected for this section.

The fine print note should also be deleted. We do not need two different NFPA tests for determining flame spread or smoke producing characteristics for two cables being similar in nature. Until (1) test method is determined the fine print note should be left out.

CASPARRO: This proposal should be rejected. Acceptance of this proposal in Principle in Part as modified by Panel 3 does not provide a specific application for this cable type. The NEC is not a product catalog nor is it a design manual and is not intended to contain an all-inclusive list of permitted products.

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

SANDERS: Reject proposed changes to present 760.31 and retain the present numbering sequence.

This change to add a new 760.31 and FPN for related information in order to provide an additional cable designator was predicated upon CMP 03 accepting several ROPs affecting 300.22. However, these were rejected due to lack of documentation that additional subcategories of "other space used for environmental air" were necessary. [See Proposals 3-89 (Log #1727), 3-90 (Log #1728), 3-91 (Log #299), 3-92 (Log #1220a) and 3-94 (Log #446)].

While the redundant text in present 760.31 should be deleted, and the proposed new last sentence to present 760.31(C) FPN should be accepted, a straight reject was selected for ROP 3-253 because of the multiple issues addressed in this one ROP. A comment will be made to bring back in December 2003 for CMP 03 ROC consideration to delete the redundant text and add the FPN. This will meet the submitter's concern that users of the NEC should be made aware of the need to review the information provided in NFPA 90A-2002, where this rejected FPN presently resides.

At present there are two types of environmental air handling mechanisms in 300.22(B) (i.e., ducts, or plenums specifically fabricated to transport environmental air). In addition, a third type is provided for in 300.22(C) for other spaces that are not of the duct variety or that does not meet the condition of being specifically fabricated, such as blower rooms, above room ceiling spaces or below floor cavities. Below floor cavities may also have to meet the requirements of Article 645, which can and does set additional conditions on wiring methods permitted under raised floors for Information Technology equipment.

Lacking this documentation, there is no clear, concise and precise evidence as to why an additional cable type designator is necessary. No technical documentation has been provided, such as fire loss data, as to why the existing type NPLFP is no longer suitable for use in the air handling space included in 300.22(C).

By retaining the existing text for type NPLFP in the reidentified 760.31(D) with its specific reference to 300.22(C) for information as to the type of "other space used for environmental air" for which it can be used, and not including this reference in the proposed text to be added to 760.31(C), leaves the impression that some other category might be involved for which no justification has been presented.

The use of the word "adequate" in present 760.31(C) is intended to provide the necessary guidance for evaluating and listing of products used in spaces that are not specifically fabricated for transporting environmental air. Note that it is always possible to employ more stringent installation methods not specifically mentioned in the NEC.

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-254 Log #1730 NEC-P03 **Final Action: Accept in Principle**
(760-31(C), FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle

Panel Statement:

Since Proposal 3-214 was submitted by the NFPA Committee on Air Conditioning the Panel has accepted the text in that Proposal. The submitter has not provided any information as to the differences in the wording between the fine print note from NFPA 90A and his recommendation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-255 Log #1793 NEC-P03 (760-31(F)) **Final Action: Accept in Principle**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise text to read as follows:

760.31(F) Fire Alarm Circuit Integrity Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time period under fire conditions shall be listed as part of an Electrical Circuit Protective System, or classified as circuit integrity (CI).

Substantiation:

The Fire Resistance Directory (formerly the Building Materials Directory) listed all systems that achieved a fire rating of electrical cables as "Electrical Circuit Protective Systems". This was the sole reference for fire-rated cables.

In the 1999 NEC, the term "Circuit Integrity" was introduced. It was a common sense definition that referred to a cable's capability "to ensure continued operation of critical circuits during a specified time under fire conditions". In a FPN, it referenced the UL2196 test as being the required fire-test — the same benchmark that applied to Electrical Circuit Protective Systems.

The UL2196 test was modified to allow "CI" cables to be tested one of 2 ways - in or out of conduit. (A reduced impact hose stream applies if the cable is tested out of conduit).

Article 760 requires that cables that are listed for circuit integrity shall be identified with the suffix "CI". However, this can only apply to fire alarm cables tested without conduit protection; under UL rules, if cable is tested in conduit, it becomes an Electrical Circuit Protective System, and so the cable cannot be marked "CI" (since that would imply it can be used without conduit).

Circuit integrity is a very general term, and is so defined. However, Article 760 restricts the term to fire alarm cables that have had a reduced impact hose stream - it suggests that there is no other option than to use the strict "CI" cable, i.e. cable tested without conduit. The use of fire alarm cable without the protection of conduit is neither common practice, nor a desirable one. The use of Electrical Circuit Protective systems (2-hour fire rated cable, when tested in conduit, as well as MI and other systems) is certainly intended, and this addition makes it specific.

This change simply overtly states that survivability may be met with an Electrical Circuit Protective System as well as "CI" cable as narrowly defined in Article 760.

Panel Meeting Action: Accept in Principle

Move the added phrase to be located after "(CI) cable" and add the existing NEC sentences into the proposal to read as follows:

(F) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable or listed as part of an Electrical Circuit Protective System . Cables identified in 760.31(C), (D), and (E) that meet the requirements for circuit integrity….. (No change to the remainder of the text in the NEC)

Panel Statement:

The term "classified" is not defined in the NEC but basically it indicates the testing, listing, and labeling of electrical equipment under specific conditions so using the term "listed" is more appropriate for the NEC.

The submitter did not indicate in the proposal whether the proposed change was meant to delete the remainder of the text in this section along with the Fine Print Notes but there is important information included in this text so this was added to the Panel Action.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-256 Log #1597 NEC-P03 (760-41) **Final Action: Accept**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-236.

Submitter: Joseph A. Ross, Ross Seminars

Recommendation:

Revise the last sentence of 760.41 as follows:
These circuits shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

Substantiation:

Many installers feel reluctant to adversely compromise the integrity of fire and smoke warning systems by supplying them from circuits that are provided with AFCIs, specifically bedroom circuits, as some national organizations have implied.

Many electrical inspectors are reluctant to be responsible for a mandate to require a smoke detector circuit that enters a bedroom for approximately three feet to be provided with an AFCI and at the same time not require AFCI protection for circuits of approximately 500 ft (average 35 circuits/@ 15 ft) that are connected to a panelboard located in a bedroom. Forty-circuit service or feeder panelboards are commonly located in bedrooms of dwelling units, mobile homes, and manufactured homes.

At a recent IAEI Conference where representatives of eleven states participated, a consensus could not be reached. To AFCI or not to AFCI a smoke detector circuit, that is the question.

Of the eight states that were surveyed, no two states were in agreement: one state was receptacles only; one was wait and see; one was no smoke detectors; one was smoke detectors; others left the decision to local municipalities for varied opinions.

Confusing? One state amended 210.12. Then amended the amendment. And is now in the process to interpret the amendment to the amendment to 210.12.

NOTE: This AFCI and/or Smoke Detector confusion has become one of the most controversial issues of both the 1999 and the 2002 NECs and it is interesting to point out that neither the NEC Handbook nor the IAEI/NFPA Analysis addresses any comment to the application of smoke detectors supplied through an AFCI circuit.

Consider the following:

1. The literal wording of 210.12 does not include smoke detectors (SD). (SDs are not rated 125-volt) (See UL "White" book, Pages 5 and 6).
2. The intent of CMP 2 when they wrote the rule does not include SDs. (Well before ROC No. 2-77 and the rule was not rewritten.)
3. Has UL evaluated or tested SDs on AFCI circuits? I think not.
4. Many electrical inspectors use a GFCI (5mA) tester for AFCIs. (And trip some models of them.)
5. CMP 16 nixed SDs on sensitive GFCI circuits. (CMP 16 did not get the chance to address SDs on sensitive AFCI circuits.) GFCIs have a 30-year track record with the NEC. AFCIs didn't have a 30-day track record with the NEC.
6. Smoke Detectors for new installations are, generally, provided with a battery back-up feature, but national statistics indicate that the majority of SDs are (1) not provided with batteries, (2) the batteries are missing, (3) the batteries are dead, or (4) the SDs are rendered inoperable by, e.g., a shower cap.

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

3-257 Log #2617 NEC-P03 (760-41) **Final Action: Accept in Principle**

Submitter: Richard F. Van Wert, Middle Department Inspection Agency

Recommendation:

Revise text to read as follows:
These circuits shall not be supplied through ground-fault circuit interrupters nor arc-fault circuit interrupters (AFCI).

Substantiation:

AFCIs need to be prohibited from being used in the same situation!

Panel Meeting Action: Accept in Principle
Panel Statement:

See the Panel action on Proposal 3-256.

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

3-258 Log #1009 NEC-P03 **Final Action: Accept**
(760-42)

Submitter: Noel Williams, Noel Williams Consulting

Recommendation:

Revise to read: "The equipment supplying PLFA circuits shall be durably marked where plainly visible to indicate each circuit that is a power-limited fire alarm circuit."

Substantiation:

As presently written, this section is not clear at all as to which equipment is to be marked. Since "equipment" has a very broad definition in Article 100, this section is sometimes interpreted to mean the conduits, boxes, and cables must be marked. Where substitute cable types are used as permitted by 760.61, the section may even be interpreted to mean the cables must be reidentified as PLFA. Many fire alarm panels supply both PLFA and NPLFA circuits, so it should be the sources (terminals) that are required to be marked. This proposal is consistent with the reidentification required by 760.52(A), Exception No. 3 and will also serve to clarify that section.

Panel Meeting Action: Accept

Panel Statement:

The title of the section indicates that the intent is to mark the Class 2 and 3 circuits. Rearranging the sentence clarifies that the marking requirement is at the equipment where the circuits originate and not on all the raceways, cables, and fittings.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-259 Log #2563 NEC-P03 **Final Action: Reject**
(760-52)

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise 760.52 as shown and add new 760.52(C).
760.52 Wiring Methods and Materials on Load Side of the PLFA Power Source.
Fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with either 760.52(A) or (B). Class A circuits shall also be installed in accordance with (C).
760.52(C) Class A Circuits. All styles of Class A circuits using physical conductors (for example, metallic, optical fiber) shall be installed such that the outgoing and return conductors, exiting from and returning to the control unit, respectively, are routed separately. The outgoing and return (redundant) circuit conductors shall not be run in the same cable assembly (that is, multiconductor cable), enclosure, or raceway.
Exception: The outgoing and return (redundant) circuit conductors shall be permitted to be run in the same cable assembly, enclosure, or raceway under any of the following conditions:
(a) For a distance not to exceed 3 m (10 ft) where the outgoing and return conductors enter or exit the initiating device, notification appliance, or control unit enclosures.
(b) Where looped conduit/raceway systems are provided, single conduit/raceway drops to individual devices or appliances.
(c) Single conduit/raceway drops to multiple devices or appliances installed within a single room not exceeding 92.9 m2 (1000 ft2) in area. [NFPA 72, 6.4.2.2.2]
FPN: A goal of NFPA 72, 6-4.2.2.2 is to provide adequate separation between the outgoing and return circuit. This separation will help ensure continued system functionality where the circuit are subjected to physical damage. An example of a Class A circuit installation is a minimum separation of 1 ft (0.305 m) where the circuit is installed vertically and 4 ft (1.22 m) where the ccircuit is installed horizontally.

Substantiation:

Wiring requirements for fire alarm systems moved from the NFPA 72 Standards to the 1975 NEC, Article 760. During the intervening years, new wiring requirements crept back into the NFPA 72. This proposal provides uses of the NEC information necessary to design, install, inspect and service Class A fire alarm system circuits.
The proposed text complies with the 2001 NEC Style Manual, paragraph 4.3.
4.3 Extracts.
4.3.1 Extracting Material from an NFPA Document and Including It in the *NEC*. Extracting provides an advantage over multiple references to requirements contained within other NFPA documents. Extracting has the disadvantage of creating a situation where the text of the source document and the user document are not identical due to different revision cycles.
4.3.2 Extract Requirements. To extract material from another NFPA document, the following requirements shall be met.
4.3.2.1 Reason. There shall be a specific technical reason for the extract.
4.3.2.2 Context. A section or paragraph being extracted from another document shall represent a complete thought and shall be entirely extracted. The context of the original material shall not be compromised or violated. Any editing of the extracted text shall be confined to making the style consistent with that of the *NEC* and then only with the concurrence of the committee having primary jurisdiction. Such concurrence shall be obtained through the staff liaison for the source document.
4.3.2.3 Identification. The number, title, and edition of the NFPA document from which the extract is taken shall appear at the beginning of the article in which the extract is used. The document number and paragraph from which the extract is taken shall appear in brackets at the end of the section in which the extract is used.

Panel Meeting Action: Reject

Panel Statement:

See the panel statement for Proposal 3-240.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Comment on Affirmative:

EGESDAL: See my Comment on Affirmative on Proposal 3-240 (Log #2557).

3-260 Log #3353 NEC-P03 (760-52) **Final Action: Accept in Principle**

Submitter: Bruce Fraser, SimplexGrinnell

Recommendation:

Add new text to read as follows:
760.52 Wiring Methods and Materials on...shall be permitted to be installed using wiring methods and materials in accordance with 760.52(A) or (B) or in a combination of (A) and (B).

Substantiation:

It has been common practice for the installation of fire alarm systems over the years to install both THHN and FPL cable in the same conduit to wire power limited fire alarm circuits. For instance, the addressable initiating devices would be wired using the FPL cable and the notification appliances would be wired using THHN conductors. Paragraph 760.52 allows installation using either the wiring methods and materials in accordance with 760.52(A) (NPLFA Wiring Methods and Materials) or 760.52(B) (PLFA Wiring Methods and Materials). Herein lies the issue. There is confusion in the field as to whether or not it is either one way or the other, or if combining the acceptable methods and materials is also allowable. Some Authorities Having Jurisdiction will require separate conduits for the circuits...THHN in one (a Chapter 3 wiring method) and...FPL cable in another (Article 760 power limited wiring methods and materials) while others (AHJs) do not have a problem with the inclusion of both THHN and FPL cables in the same conduit. The proposed wording should clear up any confusion with this issue.

Panel Meeting Action: Accept in Principle

Fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with ~~either~~ 760.52(A), ~~or~~ (B), or a combination of (A) and (B).
Delete the exception No. 2 in Section 760.52(B)(3) and change the existing Exception No.1 to just Exception as follows: "Exception: As provided for in 620.21…."
~~Exception No. 2: Other wiring methods and materials installed in accordance with the requirements of 760.3 shall be permitted to extend or replace the conductors and cables described in 760.71 and permitted by 760.52(B).~~

Panel Statement:

The text was changed for editorial purposes and to provide clarity.
Exception No. 2 was deleted since the accepted panel action has now provided clear text to deal with the information addressed in this exception.

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

3-261 Log #2990 NEC-P03 (760-52(B)(1)) **Final Action: Reject**

Submitter: Monte Ewing, State of Wisconsin

Recommendation:

Revise as follows:
Exposed or Fished in Concealed Spaces. Power-limited fire alarm (PLFA) type cables or cable substitutes shall be permitted where exposed or concealed. In completed installations and where readily accessible, cables shall be adequately supported and installed in such a way that maximum protection from physical damage is afforded by raceway or building construction (such as substantial guard strips, baseboards, door frames, ledges, and so forth). Where installed in attics and where not accessible by permanent stairs or ladders, protection shall be provided within 1.8 m (6 ft) of the nearest edge of the scuttle hole or entrance. Where located within 2.1 m (7 ft) of the floor and where not installed in raceway, cables shall closely follow the building surface and be securely fastened in an approved manner at intervals of not more than 450 mm (18 in). Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment.

Substantiation:

The present code addresses in raceway or exposed on the surface of ceiling and sidewalls or fished in concealed spaces. There is no provision for wiring through where not fished in walls, ceilings, basements, or attics without the use of raceway. I revised the wording to allow exposed cable in both new and existing construction open and concealed with provisions to provide physical protection where needed. It made no sense to follow a door frame with open cable into an attic and have to change to raceway.

Panel Meeting Action: Reject

Panel Statement:

Power-limited fire alarm cable can be installed exposed or concealed in accordance 760.52(B)(1) in the present Code. Adding the words "in completed installations and where readily accessible" is unnecessary and the change is not substantiated in the proposal. Adding more protection methods to a laundry list of protection methods does not add any additional clarity. Where damage could occur to a fire alarm cable installed in an attic, protection is already required. The submitter provided no technical substantiation to permit fire alarm cable to be installed exposed without physical protection within 2.1 m (7 ft) of the floor.

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

3-262 Log #1286 NEC-P03 **Final Action: Reject**
(760-52(B)(3))

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(3) In Hoistways. In rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, Liquidtight Flexible Nonmetallic Conduit LFNC-B or electrical metallic tubing where installed in hoistways.
Exception No. 1: As provided for in 620.21 for elevators and similar equipment.
Exception No. 2: Other wiring methods and materials installed in accordance with the requirements of 760.3 shall be permitted to extend or replace the conductors and cables described in 760.71 and permitted by 760.52(B).

Substantiation:

Liquidtight Flexible Nonmetallic Conduit is an acceptable wiring method to be used per 620.21. Current raceways listed in 760.52(B)(3) do not allow for flexibility or vibrations.

Panel Meeting Action: Reject

Panel Statement:

The present Exception No. 1 in this section provides the link necessary to tie wiring methods already permitted in hoistways in Section 620.21. Sections 620.21(A)(1)(a) and (d) provide very specific uses for liquidtight flexible nonmetallic conduit. These specific uses should not be expanded by CMP 3 since permission to install wiring in hoistways in accordance with Article 620 is outside the scope of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

Explanation of Negative:

3-263 Log #34 NEC-P03 **Final Action: Accept in Principle**
(760-52(C) (New))

NOTE: The following proposal consists of Comment 16-154 on Proposal 16-132 in the 2001 May Meeting National Electrical Code Committee Report on Proposals. This comment was held for further study during the processing of the 2002 NATIONAL ELECTRICAL CODE. The recommendation in Proposal 16-132 was:
Add titles to existing Section 760-52(b) subparagraph as follows:
(1) Add "Exposed or Fished in Concealed Spaces."
(2) Add "Passing through a Floor or Wall."
(3) Add "In Hoistways."

Submitter: Irving Mande, EST

Recommendation:

Add a new subsection (c) to read as follows:
(c) PLFA and NPLFA Wiring Methods Used on the Same Power-limited Circuit. PLFA and NPLFA conductors and cables, as permitted by Exception No. 2 of (a) and by (b) above, shall be permitted to be used on different segments of the same power-limited circuit where installed in accordance with the requirements of 760-54.

Substantiation:

In a previous code cycle, CMP 16 approved Class 1 nonpower-limited conductors and cables to be used on different segments of the same power-limited circuit with Class 2 and Class 3 power-limited conductors. Subsection (c) will allow the same rule to be applied to PLFA and NPLFA wiring.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action on Proposal 3-260, which addresses the submitter's concern in a more user friendly manner.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-264 Log #1287 NEC-P03 **Final Action: Reject**
(760-55(B))

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(B) Separated by Barriers. Power-limited fire alarm circuit cables shall be permitted to be installed together with Class 1, non–power-limited fire alarm, and medium power network-powered broadband communications circuits where they are separated by a permanent barrier or listed divider.

Substantiation:

This proposal defines that the barrier is a permanent function of the enclosure or that a removable or field installed divider that has been listed may be used to divide the fire alarm circuits from the power circuits.

Panel Meeting Action: Reject

Panel Statement:

The barrier installed between the power-limited circuit conductors and the power conductors could be a divider or any other barrier that provided the necessary separation to isolate the two systems from each other.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-264a Log #CP304 NEC-P03 **Final Action: Accept**
(760.56(D) New)

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 12 for comment.

Submitter: Code-Making Panel 3

Recommendation:

Add the proposed new paragraph with the text as follows:
760.56(D)
Audio System Circuits and PLFA Circuits. Audio system circuits described in Section 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with Sections 725.54 and 725.61 shall not be permitted to be installed in the same cable or raceway with power-limited conductors or cables.

Substantiation:

Fire alarm systems are considered to be life safety systems as an early warning method of notifying people of a fire or other emergency situation. Depending upon the voltage and amperage of the audio amplifier circuits, a fault between audio amplifier circuits and power-limited fire alarm circuits has the potential to create a serious hazard, by disrupting fire alarm system operation.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 11 Negative: 1

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-162(a) (Log #CP305).

3-266 Log #667 NEC-P03 **Final Action: Reject**
(760-57)

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise text to read as follows:
Except where installed in accordance with 760.7 and terminated at a raceway mast intended for the support of such conductors, power-limited fire alarm circuit conductors shall not be strapped, taped, or otherwise attached to the exterior of any conduit or other raceway or cable as a (primary) (required) means of support. (alternate choices in parentheses).

Substantiation:

The provisions of this section and 760.7 which include sections permitting attachment to masts are in conflict. Which section has precedence? If support by a 6 in. rigid metal conduit is prohibited, shouldn't support by cables such as Types NM, AC, MC, etc. also be included? Where adequate separate support is provided, incidental attachment to raceways or cable should be permitted.

Panel Meeting Action: Reject

Panel Statement:

These two sections are not in conflict with each other. The purpose of 760.7 is to provide installation requirements for fire alarm systems that extend beyond a single building. Section 760.57 is to prevent the fire alarm cable from being installed on the outside of the conduit or raceway. Adequate support of the fire alarm cable is necessary to prevent possible damage to the cable.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-265 Log #64 NEC-P03 **Final Action: Accept in Principle**
(760-57 & 760.58)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Section 760.57 to 760.58 and renumber Section 760.58 to be 760.57.

Substantiation:

Section 725.58 is "Support of Conductors". With this change section 760.58 will have the same title. This change will improve editorial consistency between these articles and comply with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept in Principle

Accept the recommendations in the proposal as already incorporated into the final draft of Proposal 3-223.

Panel Statement:

The proposed changes to Article 760 are incorporated into the actions in Proposal 3-223.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-267 Log #1750 NEC-P03 **Final Action: Reject**
(760-61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

760.61 Applications of Listed PLFA Cables.
PLFA cables shall comply with the requirements described in either 760.61(A), (B), or (C) or where cable substitutions are made as shown in 760.61(D).
(A) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) . Cables shall be installed in ~~ducts, plenums, and other spaces used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type FPLP. The accessible portion of abandoned multiconductor power-limited fire alarm ~~Abandoned~~ cables shall not be permitted to remain. ~~Types FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.~~

Substantiation:

[Text of Proposal 3-267 substantiation is shown on page 2210]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application or that only the accessible portion of the cable must be removed.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-268 Log #2564 NEC-P03 (760-61) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 760.61(A), Table 760.61, and Figure 760.61 as shown below. Sections 760.61(B), (C), and (D) do not change.

760.61 Applications of Listed PLFA Cables. PLFA cables shall comply with the requirements described in either 760.61(A), (B), or (C), or where cable substitutions are made as shown in 760.61(D).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type FPLD and shall be associated with the air duct system. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted where associated with the air duct systems.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type FPLD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type FPLD cable shall be mechanically protected to a height of 7 feet above the floor. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted where associated with the plenum systems.

(b ~~A) Plenum.~~ Cables installed in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type FPLD or Type FPLP. Abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

Revise Table 760.61 as shown below:

INSERT Table 760.61 HERE

(Table shown on page 2717)

Revise Figure 760.61 Cable Substitution Hierarchies as shown.

INSERT Figure 760.61 HERE

Substantiation:

[Text of Proposal 3-268 substantiation is shown on page 2221]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

There has been no substantiation given to warrant a height restriction without physical protection. The FPN was not accepted since there is nothing in Section 760.61 that requires a reference back to NFPA 90A.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative Vote on Proposal 3-169.

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

EGESDAL: See my Comment on Affirmative on Proposal 3-207 (Log #2438).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-269 Log #3424 NEC-P03 **Final Action: Accept in Principle**
(760-61, & 760.71)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Robert Wessels, CommScope Inc.

Recommendation:

[Text of Proposal 3-269 recommendation is shown on page 2224]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 760.61 and similar sections in Articles 725, 770, 800, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable

The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

In summary, this proposal establishes limited fire hazard duct cable for used in plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, FPLP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and

Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-186 (Log #882) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-270 Log #2082 NEC-P03 (760-61(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise text to read as follows:

760.61(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type FPLD or Type FPLP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type FPLD. The accessible portion of abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type FPLD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type FPL plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.

2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "ceiling cavity plenums", "inaccessible plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-271 Log #2083 NEC-P03 (760-61(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise text to read as follows:

760.61(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type FPLD or Type FPLP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type FPLD. The accessible portion of abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type FPLD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type FPL plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "ceiling cavity plenums", "inaccessible plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-272 Log #2084 NEC-P03 (760-61(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise text to read as follows:

760.61(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type FPLD or Type FPLP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type FPLD. The accessible portion of abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type FPLD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type FPL plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.

2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "ceiling cavity plenums", "inaccessible plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-273 Log #2433 NEC-P03 **Final Action: Accept in Principle**
(760-61(A))

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Add a new last sentence as follows:
Type FPLP-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on Comment 16-98 for the 2002 NEC overturned CMP 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified."... "The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

Type FPLP-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Insert the word "Cable" after "FPLP-CI."

Delete the word "rating" and replace with "rated cable."

Panel Statement:

This is an editorial clarification.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-274 Log #2565 NEC-P03 **Final Action: Accept in Principle**
(760-61(A))

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a new last sentence as follows:
Type FPLP-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable *"because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." …."The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."*

Type FPLP-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposal 3-273.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-275 Log #2434 NEC-P03 (760-61(B)) **Final Action: Accept in Principle**

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Add a new last sentence as follows:
Type FPLR-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on Comment 16-98 for the 2002 NEC overturned CMP 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified."... "The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

Type FPLR-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Insert this new sentence as the third sentence in (1).
Insert the word "Cable" after "FPLR-CI."
Delete the word"rating" and replace with "rated cable."

Panel Statement:

The word change is an editorial clarification and the panel inserted the sentence where appropriate.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-276 Log #2566 NEC-P03 (760-61(B)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a new last sentence as follows:
Type FPLR-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable *"because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." …."The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."*

Type FPLR-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposal 3-275.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-277 Log #2435 NEC-P03 (760-61(C)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Add a new last sentence as follows:
Type FPL-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on Comment 16-98 for the 2002 NEC overturned CMP 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified."... "The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

Type FPL-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Insert the word "cable" after "FPL-CI." "As described in either (1), (2), (3) or (4)" to be added after the word "installed." Delete the word "rating" and replace with "rated cable" to read as follows: "Type FPL-CI cable shall be permitted to be installed as described in either (1), (2),(3) or (4) to provide a 2-hour circuit integrity rated cable." Insert this new sentence as a new second sentence to (C).

Panel Statement:

The word change is an editorial clarification and the panel inserted the sentence where appropriate. The FPL-CI cable can be installed in any of the four mentioned applications listed in (C).

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-278 Log #2567 NEC-P03 (760-61(C)) **Final Action: Accept in Principle**

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Add a new last sentence as follows:
Type FPL-CI shall be permitted to be installed to provide a 2-hour circuit integrity rating.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable *"because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." …."The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."*

Type FPL-CI cable is in the 2002 NEC with appropriate listing and marking requirements, but no use requirements. The proposed text responds to the NEC TCC ruling. NFPA 72-2002, National Fire Alarm Code, has a 2-hour circuit integrity requirement for certain circuits. One of the permitted options is a 2-hour fire rated cable. Therefore, circuit integrity cable with a "CI" suffix should be permitted to remain in the NEC.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the panel action and statement on Proposal 3-277.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-279 Log #77a NEC-P03 (760-61(D)) **Final Action: Accept in Principle in Part**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

[Recommendation of Proposal 3-279 is shown on page 2225]

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. Also, the listing requirement for multipurpose cables are deleted because the authorization to list multipurpose cables expires on July 1, 2003.

Panel Meeting Action: Accept in Principle in Part

Accept the recommendations in the proposal to renumber the reference in 760.61(D), FPN from "800.51" to "800.82" as already incorporated into the draft in Proposal 3-223. Reject the remainder of the proposal.

Panel Statement:

The remaining proposed changes are outside the jurisdiction of Panel 3.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-281 Log #1794 NEC-P03 (760-61(D)) **Final Action: Reject**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Add to 760.61(D) as follows:

760.61(D) Fire Alarm Cable Uses and Permitted Substitutions. The uses and permitted substitutions for fire alarm cables listed in Table 760.61 shall be considered suitable for the purpose and shall be permitted. Type MI cable, bare or with an approved jacket suitable for plenum rating, shall also be permitted.

Substantiation:

Mineral Insulated twisted pair fire alarm cable (MI) has been used successfully around the world for years. MI fire alarm cables are UL listed as such.

Article 760 limits it to FPL and NPLF types, which are constructed to UL 1424 and 1425, and refer only to polymeric cable constructions. MI cable therefore is not strictly recognized for use as a FA cable. Article 760 has "CI" cables and FPL/NPLF so interwoven that other constructions such as MI, which is inherently suitable, is currently excluded. By including MI cable in 760.61, this exclusion will be remedied.

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

Panel Meeting Action: Reject

Panel Statement:

Type MI is permitted to be installed as fire alarm system wiring. Chapter 3 wiring methods are permitted for fire alarm circuits. Type MI is described in Chapter 3. See Section 760.52(A). The proposed text is unnecessary.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-283 Log #2631 NEC-P03 (760-61(D)) **Final Action: Accept in Principle in Part**

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise 760.61(D) as shown below:

(D) Fire Alarm Cable Uses and Permitted Substitutions. The uses and permitted substitutions for fire alarm cables listed in Table 760.61 shall be considered suitable for the purpose and shall be permitted. Where substitute cables from Article 800 are used, the wiring rules of this article shall apply.

FPN 1: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, CMG, CM), see 800.51.

FPN 2: See 760.52(B)(1) for an example of special wiring rules for fire alarm cable.

Substantiation:

This clarification is needed because some code users believe that when they use a substitute cable from Article 800, that Article 800 requirements apply. For example, Section 760.51(B)(1) requires secure fastening of cables within 7 feet of the floor, regardless of whether or not power-limited fire alarm cables are used or whether communications cables are used as substitute. There is no similar requirement in Article 800.

Panel Meeting Action: Accept in Principle in Part

Change submitters proposed text to: "Where substitute cables are installed, the wiring requirements of Article 760, Parts I and III shall apply."

Reject the remainder of the Proposal.

Panel Statement:

The text was modified to make it clear that where substitute cables are installed, the wiring requirements of Parts I and III of Article 760 will apply, which addresses the submitter's intent. The suggested FPN is not necessary since all of Article 760 consists of special requirements for fire alarm systems, including cables.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-280 Log #1656 NEC-P03 **Final Action: Accept in Principle in Part**
(760-61(D), Table 760.61)

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to multipurpose cable in the Code. Specifically delete:

645.5(5)(C) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM ~~and MP~~ (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R or G. Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

~~760.61(D) FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, CMG, CM), see 800.51.~~

Table 760.61 Delete the column "coaxial".

Table 800.50 Delete the rows for MPP, MPR and MP cables.

800.51~~(G) Multipurpose (MP) Cables. Until July 1, 2003, cables that meet the requirements for Types CMP, CMR, CMG, and CM and also satisfy the requirements of 760.71(B) for multiconductor cables and 760.71(H) for coaxial cables shall be permitted to be listed and marked as multipurpose cable Types MPP, MPR, MPG, and MP, respectively.~~

800.52(D) Cable Trays. Types ~~MPP, MPR, MPG, and MP multipurpose cables and~~ Types CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays. Communications raceways, as described in 800.51, shall be permitted to be installed in cable trays.

800.53(D) Cable Trays. Types ~~MPP, MPR, MPG, and MP multipurpose cables and~~ Types CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays.

Table 800.53 Delete MPP, MPR and MP.

Substantiation:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned Code-Making Panel 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

There are no requirements or specifications for the use of multipurpose cable versus the communications cables already specified. Consequently, the code panels are obliged to follow the Technical Correlating Committee directive and accept this proposal.

Panel Meeting Action: Accept in Principle in Part

Accept the deletion of the fine print note in 760.61(D), the coaxial column in Table 760.61 and remove the coaxial cable column and arrows in Fig. 760.61. Delete the Type MP Cable description at the bottom of Fig. 760.61.

Reject the remainder of the Proposal.

Panel Statement:

The panel has jurisdiction over the text in 760.61, the Table 760.61, and Figure 760.61, and does not have jurisdiction over the remainder of the recommendation.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-282 Log #1795 NEC-P03 **Final Action: Reject**
(760-61(D), Table 760.61 and Figure 760.61)

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Revise Table 760.61 and Figure 760.61 to include an alternative permitted substitute.

Insert NEC Tb 760.61 here

(Table shown on page 2717)

Insert Artwork here
Figure 760.61

Substantiation:

Mineral Insulated twisted pair fire alarm cable (MI) has been used successfully around the world for years. MI is not strictly recognized for use as a FA cable, as Article 760 limits it to FPL and NPLF types, which are constructed to UL 1424 and 1425, and refer only to polymeric cable constructions. UL were approached about the problem and agreed to list MI fire alarm cable as "Type MI-CI fire alarm plenum cable".

Article 760 has "CI" cables and FPL/NPLF so interwoven that other constructions such as MI, which is inherently suitable, is currently excluded.

760.61(D) "Fire Alarm Cables and Permitted Substitutions" lists, in Table 760.61, alternatives to FPL, FPLR and FPLP type designations. This proposal would legitimize MI as an alternative method.

Panel Meeting Action: Reject

Panel Statement:

See panel statement on Proposal 3-281.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-284 Log #1069 NEC-P03 (760-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Hong Chen, OFS

Recommendation:

Revise 760.71 as shown below:

Sections 760.71(A), (B), and (C) do not change.

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

(D) Type FPLD. Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 25, Standards Method of Test of Surface Burning Characteristics of Building Materials, to a maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~D~~E) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:

"E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; "I" to "J"; and "J" to "K".

Renumber "Table 760.71(I) Cable Markings" to "Table 760.71(J) Cable Markings".

Insert Table 760.71 Here

(Table shown on page 2717)

Revise Section 760.61(A), Table 760.61, and Figure 760.61 as shown below:

PLFA cables shall comply with the requirements described in either 760.61(A), (B), or (C) or where cable substitutions are made as shown in 760.61(D).

760.61 Applications of PLFA Cables. PLFA cables shall comply with the requirements described in either 760.61(A), (B), (C), or (~~C~~D), or where cable substitutions are made as shown in 760.61(~~D~~E).

(A) Air Ducts. Cables installed in air ducts shall be Type FPLD and shall be associated with the air duct system they are installed in. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted where associated with the air duct system they are installed in.

(~~A~~B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental~~ air shall be Type FPLD or FPLP. Abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Renumber the remaining subparagraphs as follows:

"B" to "C"

"C" to "D"

"D" to "E"

Revise Table 760.61 as shown below:

Insert Table 760.61 Here

(Table shown on page 2717)

Revise Figure 760.61 as shown:

Insert Artwork (Figure 760.61) Here

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems. One of the issues addressed in their proposals is that NEC section 760.61 and similar sections in Articles 725, 770, 800, 820, and 830, permit plenum (FPLP, CMP, etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (FPLP, CMP, etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not

plenum cable (FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and, 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in a duct. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditiioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has been accepted since the NFPA 90A Committee has provided a preferred FPN that has had Committee approval. The phrase "air ducts" has not been accepted since this phrase is not used in the NEC. The phrase " abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-286 Log #1148 NEC-P03 (760-71) **Final Action: Accept in Principle in Part**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Richard Fransen, Daiken America, Inc.

Recommendation:

Revise 760.71 as shown below:

Sections 760.71(A), (B), and (C) do not change.

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

(D) Type FPLD. Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in ducts, plenums and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~D~~E) Type FPLP. Type FPLD power-limited fire alarm plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installattion in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:

"E" to "F"; "F" to "G"; "G" to "H"; "H" to "I" "I" to "J"; and "J" to "K".

Renumber "Table 760.71(I) Cable markings" to "Table 760.71(J) Cable Markings".

INSERT TABLE 760.71 (~~I~~J) CABLE MARKINGS HERE

(Table shown on page 2718)

Revise Section 760.61(A), Table 760.61 and Figure 760.61 as shown below:

(A) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type FPLD or FPLP. Abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Revise Table 760.61 as shown below:

INSERT TABLE 760.61 CABLE USES AND PERMITTED SUBSTITUTIONS HERE

(Table shown on page 2718)

Revise Figure 760.61 as shown below:

INSERT FIGURE 760.61 HERE

Substantiation:

The Technical Committee on Air-Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, The Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA 90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed combustible plenum cable that is the equivalent of FPLP, MPP, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread

index of 25 maximum. Hence, listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Note: Supporting Material is available for Review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle in Part

[Text of Proposal 3-286 panel action is shown on page 2226]

Panel Statement:

The phrase "a limited fire hazard cable" was deleted from the recommended text since the NEC does not have a definition or explanation for limited fire hazard. The phrase "ducts, plenums, and other spaces for environmental air" was retained since the phrase "ceiling cavity plenums and raised floor plenums" are not recognized in the NEC. See also the panel statement in Proposal 3-94. In Table 760.71 for cable marking, the phrase "ceiling cavity and raised floor" must be deleted from cable marking identification FPLP since this phrase is not recognized in the NEC. The same action should be taken for Table 760.61.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 8 Negative: 4

Explanation of Negative:

CASPARRO: This proposal should be rejected. Acceptance of this proposal in Principal in Part as modified by Panel 3 does not provide a specific application for this cable type. The NEC is not a product catalog nor is it a design manual and is not intended to contain an all-inclusive list of permitted products. It should also be noted that the panel statement is not consistent with the panel action taken in the MS Word include file (Proposal 3-286 cut and paste.doc). The title "Ceiling Cavity Plenum" and "Raised Floor Plenum" was deleted from 760.61(A) and was not referenced in the panel statement. Also, the submitter did not provide adequate substantiation why the use of plenum rated cable should be limited in application and the phrase "ceiling cavity plenum" and "raised floor plenum" are not recognized in the NEC.

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

SANDERS: Reject proposed changes to present 760.61(A), Table 760.61 and Figure 760.61 and retain the present language. It is understood this section, table and figure will retain the same number sequence in the 2005 NEC.

Reject the proposed text for 760.82(D) and its FPN, since there is no need for the proposed text based on the present understanding of the general text found in the 300.22.

Reject proposed changes to add a new 760.71(D) and FPN. It is understood this section will be identified as 760.82 in the 2005 NEC. It is further understood that the proposed 760.71(E) [presently identified as 760.71(D)] first sentence contains a typo where the first sentence starts "Type FPLD" and the present text begins "TYPE FPLP", and this reject will retain that without change. There is no need for the proposed text based on the present understanding of the present text in 300.22.

While the second sentence in present 760.61(A) should be deleted and the proposed new last sentence to present 760.71(D) FPN should be accepted, a straight reject was selected for ROP 3-286 because of the multiple issues addressed by this one ROP. A comment will be made to bring back for review in December 2003 for CMP 03 ROC consideration the sentence deletion [see ROP 3-223] and this FPN sentence. This will meet the submitter's concern that users of the NEC should be made aware of the need to review the information provided in NFPA 90A-2002, where this rejected FPN presently resides.

This change to provide additional cable designators was predicated upon CMP 03 accepting several ROPs affecting 300.22, which were rejected due to lack of documentation that additional subcategories of "other space used for environmental air" were necessary. [See Proposals 3-89 (Log #1727), 3-90 (Log #1728), 3-91 (Log #299), 3-92 (Log #1220a) and 3-94 (Log #446)].

At present there are two types of environmental air handling mechanisms in 300.22(B) (i.e., ducts, or plenums specifically fabricated to transport environmental air). In addition, a third type is provided for in 300.22(C) for other spaces that are not of the duct variety or that does not meet the condition of being specifically fabricated, such as blower rooms, above room ceiling spaces or below floor cavities. Below floor cavities may also have to meet the requirements of Article 645, which can and does set additional conditions on wiring methods permitted under raised floors for Information Technology equipment.

Lacking this documentation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the existing type FPLP cable in 760.71(D) is not suitable for use in the environmental air handling spaces included in 300.22(C), and why existing type FPLP, FPLR and FPL cables in 760.61(A) are not suitable for use in environmental air handling spaces as provided for in 300.22(C).

The use of the word "adequate" in present 760.71(D) (identified as 760.82 for 2005 NEC) is intended to provide the necessary guidance for evaluating and listing of products used in spaces that are not specifically fabricated for transporting environmental air. Note that it is always possible to employ more stringent installation methods not specifically mentioned in the NEC.

Comment on Affirmative:

AYER: I agree with the concept of allowing the use of a limited combustible cable. If you read the code closely there is no application at the present time for a listed cable, which can be installed in Ducts or plenums as specified in 300.22(B).

The wording in Article 760 of where cables may be installed can be confusing. The present wording states that type FPLP cable can be installed "in ducts, plenums, or other spaces used for environmental air". This leaves the designer or installer to think that he can install this type cable in either locations of 300.22(B) or (C) when technically he can only install this cable in 300.22(C).

The proposed 760.71(E) should be reworded to state that type FPLP cable can be used "in other spaces used for environmental

air". The designer or installer will be better able to draw a distinction that limited low combustible cables (FPLD) can be installed in accordance with 300.22(B) or (C) and FPLP cables can be installed in 300.22(C). I have revised the wording as follows:

760.71(D) Type FPLD. Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in ducts, plenums and other space used for environmental air and shall also be listed as ~~a limited fire hazard cable~~ having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

(~~D~~E) Type FPLP. Type FPL~~P~~D power-limited fire alarm plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and~~ other spaces used for environmental air ~~ceiling cavity plenums and raised floor plenums~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

Revise Section 760.61(A), Table 760.61, and Figure 760.61 as shown below:

(A) ~~Ceiling Cavity Plenums and Raised Floor~~ Ducts and Plenums. Cables installed in ducts, ~~ceiling cavity plenums and raised floor~~ plenums, and other spaces used for environmental air shall be Type FPLD ~~or FPLP. Abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.~~

(~~B~~A) Other spaces used for environmental air Plenum. Cables installed in ~~ducts, plenums, and~~ other spaces used for environmental air shall be Type FPLP. ~~Abandoned cables shall not be permitted to remain.~~ Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-287 Log #1439 NEC-P03 (760-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Dan Kennefick, Ber-Tek a Nexans Company

Recommendation:

Revise 760.71 as shown below:

Sections 760.71(A), (B), and (C) do not change.

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

(D) Type FPLD. Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System, for materials installed in ducts and plenums.

(~~D~~ E) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke producing cable is by establishing an acceptable value of the smoke produced when tested n accordance with NFPA 262, 1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining subparagraphs as follows:

"E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; "I" to "J"; and "J" to "K".

Renumber "Table 760.71(I) Cable Markings" to "Table 760.71(J) Cable Markings".

INSERT TABLE 760.71(J) HERE

(Table shown on page 2718)

Revise Section 760.61(A), Table 760.61, and Figure 765.61 as shown below. PLFA cables shall comply with the requirements described in either 760.61(A), (B), or (C) or where cable substitutions are made as shown in 760.61(D).

760.61 Applications of PLFA Cables. PLFA cables shall comply with the requirements described in either 760.61(A), (B), (C), or (~~C~~ D), or where cable substitutions are made as shown in 760.61(~~D~~ E).

(A) Air Ducts. Cables installed in air ducts shall be Type FPLD and shall be associated with the air duct system they are installed in. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted where associated with the air duct system they are installed in.

(~~A~~ B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts,~~ ceiling cavity plenums and raised floor plenums~~, and other spaces used for environmental~~ air shall be Type FPLD or FPLP. Abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

Renumber the remaining subparagraphs as follows:

"B" to "C"

"C" to "D"

"D" to "E"

Revise Table 760.61 as shown below:

INSERT TABLE 760.61 HERE

(Table shown on page 2718)

Revise Figure 760.61 as shown below:

INSERT FIGURE 760.61 HERE

Figure 760.61 Cable Substitution Hierarchy

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, had made a series of proposals to correlate NFPA 70, National Electrical Code, with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 760.61 and similar sections in Articles 725, 770,

800, 820, and 830, permit plenum (FPLP, CMP, etc.), cable to be installed in "ducts, plenums and other space used for environment air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (FPLP, CMP, etc.), to ceiling cavity and raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A? In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

(1) Listed noncombustible cable

(2) Listed limited combustible cable that has a maximum smoke developed index of 50

(3) Listed combustible plenum cable that is the equivalent of FPLP, CMP, etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not be qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.), because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. Also see my presentation from the BICSI 2002 Spring Conference.

Two paragraphs from the substantiation to the proposal from the Air-Conditioning Committee are shown below:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

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

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has been accepted since the NFPA 90A Committee has provided a preferred FPN that has had Committee approval. The phrase "air ducts" has not been accepted since this phrase is not used in the NEC. The phrase " abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-291 Log #1751 NEC-P03 (760-71) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

Type FPL cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 760.71(A) through (H) and shall be marked in accordance with 760.71(I). Insulated continuous line-type fire detectors shall be listed in accordance with 760.71(J).

(A) Conductor Materials. Conductors shall be solid or stranded copper.

(B) Conductor Size. The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG.

(C) Ratings. The cable shall have a voltage rating of not less than 300 volts.

(D) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ~~other space used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(E) Type FPLR. Type FPLR power-limited fire alarm riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(F) Type FPL. Type FPL power-limited fire alarm cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of risers, ~~ducts~~, plenums, including ceiling cavity plenums and raised floor plenums, ~~and other space used for environmental air~~ and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 3-291 substantiation is shown on page 2231]

Panel Meeting Action: Reject

Panel Statement:

The submitter has not provided adequate substantiation why the use of plenum rated cable should be limited in application.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-293 Log #2359 NEC-P03 (760-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: J. R. Craig, ComNet

Recommendation:

Revise 760.71 as shown:

[Text of Proposal 3-293 recommendation is shown on page 2244]

Substantiation:

[Text of Proposal 3-293 substantiation is shown on page 2110]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-295 Log #2568 NEC-P03 (760-71) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 760.71 as shown below. Sections 760.71(A), (B), and (C) do not change.

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors

(D) Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for materials installed in ducts and plenums.

(~~D~~E) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in~~-ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for installation in ceiling cavity plenums and raised floor plenums.

Renumber existing subparagraphs as follows: "E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; and "I" to "J"

INSERT Table 760.71(J) HERE

(Table shown on page 2719)

Note: Cables identified in (D), (E), ~~and~~ (F), and (G) meeting the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, FPLD-CI, FPLP-CI, FPLR-CI, and FPL-CI).

FPN: Cable types are listed in descending order of fire-resistance rating.

(K~~J~~) Insulated Continuous Line-Type Fire Detectors. Insulated continuous line-type fire detectors shall be rated in accordance with 760.71(C), listed as being resistant to the spread of fire in accordance with 760.71(D) through (G~~F~~), marked in accordance with 760.71(J~~I~~), and the jacket compound shall have a high degree of abrasion resistance.

Substantiation:

[Text of Proposal 3-295 substantiation is shown on page 2252]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-285 Log #1147 NEC-P03 **Final Action: Accept in Principle**
(760-71& 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Revise Section 760.71 as shown below. Sections 760.71(A), (B) and (C) do not change.

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

(D) Type FPLD. Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~D~~E) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other space used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installationof Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber existing subparagraphs as follows: "E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; and "I" to "J".

INSERT TABLE 760.71 (J~~I~~) Cable Markings HERE

(Table shown on page 2718)

Note: Cables in (D), (E), ~~and~~ (F), and (G) meeting the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, FPLD-CI, FPLC-CI, FPLR-CI, and FLP-C
I).

FPN: Cable types are listed in descending order of fire-resistance rating.

(K~~J~~) Insulated Continuous Line-Type Fire Detectors. Insulated continuous line-type fire detectors shall be rated in accordance with 760.71(C), listed as being resistant to the spread of fire in accordance with 760.71(D) through (G~~F~~) marked in accordance with 760.71 (J~~I~~), and the jacket compound shall have a high degree of abrasion resistance.

Revise Section 760.61(A), Table 760.61and Figure 760.61 as shown below. Sections 760.61(B), (C), and (D) to not change.

760.61 Applications of Listed PLFA Cables. PLFA cables shall comply with the requriements described in either 760.61(A), (B), or (C), or where cable substitutions are made as shown in 760.61(D).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type FPLD and shall be associated with the air duct system. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted where associated with the air duct systems.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type FPLD and shall be associated with the plenum system. Where installed in an air-handlng unit room plenum, Type FPLD cable shall be mechanically protected to a height of 7 feet above the floor. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted where associated with the plenum systems.

(b~~A~~) ~~Plenum~~. Cables installed in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type FPLD or Type FPLP. Abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilaitng Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

Revise Table 760.61 as shown below:

INSERT TABLE 760.61 CABLE USES AND PERMITTED SUBSTITUTIONS HERE

(Table shown on page 2718)

Revise Figure 760.61 Cable Substitution Hierarchies shown below:

INSERT FIGURE 760.61 HERE

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP, etc.) cable to be installed in "ducts, plenums, and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the air-conditioning committee to restrict plenum cable (CL2P, CL3P, CMP, etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums". The answers is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum able (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish 'limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for use in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has been accepted since the NFPA 90A Committee has provided a preferred FPN that has had Committee approval. The phrase "air ducts" has not been accepted since this phrase is not used in the NEC. The phrase " abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

3-289 Log #1697 NEC-P03 **Final Action: Accept in Principle**
(760-71 & 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Patricia Jenks, Krone Digital Communications

Recommendation:

[Text of Proposal 3-289 recommendation is shown on page 2228]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770,
820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-290 Log #1703 NEC-P03 **Final Action: Accept in Principle**
(760-71 & 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Robert Dennelly, Avaya

Recommendation:

[Text of Proposal 3-290 recommendation is shown on page 2230]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 760.61 and similar sections in Articles 725, 770, 800, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, FPLP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, the article I have provided: "Burning Issue - New Plenum Cable Enhances Fire Safety" from the February 2001 issue of "Cabling Business Magazine," by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code

panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Note: Supporting Material available for review at NFPA headquarters.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-292 Log #1849 NEC-P03 **Final Action: Accept in Principle**
(760-71 & 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise Section 760.71 as shown below. Sections 760.71(A), (B), and (C) do not change.

760.71 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

(D) Type FPLD. Type FPLD power-limited fire alarm duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~D~~E) Type FPLP. Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in~~-ducts, plenums, and other spaces used for environmental air-~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining existing subparagraphs as follows:
"E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; and "I" to "J".

Revise Table 760.71 Cable Markings as shown below.

Insert Table 760.71 Here

(Table shown on page 2719)

(K~~J~~) Insulated Continuous Line-Type Fire Detectors. Insulated continuous line-type fire detectors shall be rated in accordance with 760.71(C), listed as being resistant to the spread of fire in accordance with 760.71(D) through (G~~F~~), marked in accordance with 760.71(J~~I~~), and the jacket compound shall have a high degree of abrasion resistance.

Revise Section 760.61(A), Table 760.61, and Figure 760.61 as shown below. Sections 760.61(B), (C), and (D) do not change.

760.61 Applications of Listed PLFA Cables.

PLFA cables shall comply with the requirements described in either 760.61(A), (B), or (C), or where cable substitutions are made as shown in 760.61(D).

(A) Air Ducts and Plenums.

Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type FPLD and shall be associated with the air duct system. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with Section 300.22 shall be permitted where associated with the air duct systems.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type FPLD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type FPLD cable shall be mechanically protected to a height of 7 ft above the floor. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with Section 300.22 shall be permitted where associated with plenum systems.

(b~~A~~) ~~Plenum.~~ Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums ~~ducts, plenums, and other spaces used for environmental air-~~ shall be Type FPLP or Type FPLP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type FPLP. The accessible portion of ~~Abandoned~~ abandoned cables shall not be permitted to remain. Types FPLD, FPLP, FPLR, and FPL cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditiioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

Revise Table 760.61 as shown below:

Insert Table 760.61 Here

(Table shown on page 2719)

Insert Figure 760.61 Here

Substantiation:

I am a member of the 90A Committee who worked on the 2002 90A Standard and voted in favor of the listing requirement for "limited combustible cable"*, which is now included in the document. However, the 2002 edition of the 90A Standard does not address the installation of wire and cable in ducts and plenums, other than ceiling cavity plenums and raised floor plenums.

Since there are field applications where cables are installed inside ducts and other than ceiling cavity plenums and raised floor plenums, it seems prudent that the Class of cables described herein should be required since they meet all the requirements for supplementary materials plus they meet all the requirements for use in ceiling cavity and raised floor plenums.

Since these cables are inaccessible, it is not feasible to remove them. Therefore, a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Based on extensive work by the FPRF, the Types of cables described herein have significantly lower fuel load and lower smoke production than conventional plenum cables Types.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording contained in proposals submitted by the 90A Committee. The cable substitution table and figure have been revised in order to make them easier to understand.

*Note: The term limited combustible was not used in the proposed text. The Standards Council, in a recently, directed that this term not be used for cables.

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed for duct cable.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums", "inaccessible plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).

EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).

KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.

EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).

KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-294 Log #2440 NEC-P03 **Final Action: Accept in Principle**
(760-71 & 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

[Text of Proposal 3-294 recommendation is shown on page 2245]

Substantiation:

[Text of Proposal 3-294 substantiation is shown on page 2247]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 and Proposal 3-173.
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-296 Log #3021 NEC-P03 **Final Action: Accept in Principle**
(760-71 760.61)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Bob Allen, Mohawk/DCT

Recommendation:

Revise Section 760.71 as follows: Sections 760.71(A), (B), and (C) do not change.

[Text of Proposal 3-296 recommendation is shown on page 2111]

Substantiation:

[Text of Proposal 3-296 substantiation is shown on page 2254]

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums" and "raised floor plenums" were not accepted by CMP-3. See also the panel statement in Proposal 3-94.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative on Proposal 3-169 (Log #2554).
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-288 Log #1663 NEC-P03 **Final Action: Accept in Principle**
(760-71, 760.71 (A), (B) and (C))

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

[Text of Proposal 3-288 recommendation is shown on page 2227]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 760.61 and similar sections in Articles 725, 770, 800, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types CL2D and CL3D, duct have significantly lower fuel load and lower smoke production than conventional Types CL2P and CL3P plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors offices, clean rooms, laboratories, strip malls etc

Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, FPLP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution table and figure have been simplified in order to make them easier to understand. Multipurpose cables have been deleted because the listing requirement no longer exists. Likewise the cable marking table has been simplified. The requirement for the removal of abandoned cables has been removed because it is redundant.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised

floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See the Panel Action and Statement on Proposal 3-286. The proposed revision to the FPN for Type FPLP has not been accepted since the NFPA 90A Committee has provided a preferred FPN that has Committee approval. The phrase "abandoned cables shall not be permitted to remain" has been deleted based upon the action in Proposal 3-173 but the phrase still remains in 760.3 in a revised format.

The concepts of "air duct", "ceiling cavity plenums", "raised floor plenums", and "inaccessible plenums" were not accepted by CMP-3.

There has been no substantiation given to warrant a height restriction without physical protection.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 9 Negative: 3

Explanation of Negative:

CASPARRO: See my Explanation of Negative on Proposal 3-286 (Log #1148) and Proposal 3-173 (Log #190).
EASTER: See my Explanation of Negative Vote on Proposal 3-169.
KEDEN: See my Explanation of Negative on Proposal 3-169 (Log #2554).

Comment on Affirmative:

AYER: See my Comment on Affirmative on Proposal 3-286.
EGESDAL: See my Comment on Affirmative on Proposal 3-190 (Log #1070).
KUMANDAN: See my Comment on Affirmative on Proposal 3-94.

3-297 Log #1731 NEC-P03 **Final Action: Accept in Principle**
(760-71(D), FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 3-89.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

~~FPN: One method of defining low-smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle

Panel Statement:

See Panel statement on Proposal 3-215.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-298 Log #1796 NEC-P03 (760-71(G)) **Final Action: Accept in Principle**

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Recommendation:

Modify the wording as follows:

760.71(G) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time period under fire conditions shall be listed as part of an Electrical Circuit Protective System, or classified as circuit integrity (CI).

Substantiation:

The fire Resistance Directory (formerly the building Materials Directory) listed all systems that achieved a fire rating of electrical cables as "electrical Circuit Protective Systems". This was the sole reference for fire-rated cables.

In the 1999 NEC, the term "Circuit Integrity" was introduced. It was a common sense definition that referred to a cable's capability "to ensure continued operation of critical circuits during a specified time under fire conditions". In a FPN, it referenced the UL2196 test as being the required fire-test — the same benchmark that applied to Electrical Circuit Protective Systems.

The UL2196 test was modified to allow cables to be tested one of 2 ways - in or out of conduit. (A reduced impact hose stream applies if the cable is tested out of conduit).

In Article 760, the marking of "CI" cables was addressed by requiring that cables that are listed for circuit integrity shall be identified with the suffix "CI".

However, cable may be tested either without or with conduit protection. If tested without conduit protection, it must be printed with a "CI" suffix according to Article 760.

If on the other hand it is tested in conduit, it becomes an Electrical Circuit Protective System, and so the cable cannot be marked "CI", since there is more to the system than just the cable.

Circuit integrity is a very general term, and is so defined. Because Article 760 makes reference to..."Cables that are listed for circuit integrity shall be identified with the suffix CI...", it suggests that there is no other option than to use the strict "CI" cable, i.e. cable tested without conduit. The use of cable without conduit in a fire alarm system (other than MI cable) is nether common practice, nor a desirable one. The use of Electrical Circuit Protective Systems (2-hour fire rated cable, when tested in conduit, as well as MI and other systems) is certainly intended, and this addition makes it specific.

Panel Meeting Action: Accept in Principle

Move the added phrase to be located after "(CI) cable" and add the existing NEC sentences into the proposal to read as follows:

(G) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable or listed as part of an Electrical Circuit Protective System . Cables identified in 760.71(D), (E)….. (No further change by this proposal to the existing text)

Panel Statement:

The term "classified" is not defined in the NEC but basically it indicates the testing, listing, and labeling of electrical equipment under specific conditions so using the term "listed" is more appropriate for the NEC.

The submitter did not indicate in the proposal whether the proposed change was meant to delete the remainder of the text in this section along with the Fine Print Notes but there is important information included in this text so this was added to the Panel Action.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-299 Log #3310 NEC-P03 (760-71(G)) **Final Action: Accept**

Submitter: Edward Walton, Draka USA

Recommendation:

Insert new reference in paragraph 760.71(G) as shown:

(G) Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 760.71(D), (E), ~~and~~ (F), and (H) that meet the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, FPLP-CI, FPLR-CI, and FPL-CI).

Substantiation:

Adds reference to "Coaxial Cables" as a cable type suitable for listing as circuit integrity (CI) cable. There is heightened interest in the ability to maintain video operations throughout the time of an emergency. It is vitally important that NFPA 70, National Electrical Code, offer a code-complying method for meeting these requirements.

It behooves the NEC to make certain that it makes suitable provisions to recognize specialized electrical components and installation methods that will allow building owners to meet requirements of other documents that seek to assure life safety, property protection, and emergency management.

Panel Meeting Action: Accept

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

16-5 Log #123 NEC-P16 (770) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the action on this proposal is modified by Proposals 16-9, 16-10, 16-11, 16-13, 16-15, 16-17, 16-20, 16-21, 16-24, 16-25, 16-26, 16-27, 16-28, 16-31, 16-32, 16-37, 16-46, 16-48, 16-49, 16-50, 16-53, 16-58, 16-59a, 16-62, 16-63, and 16-64.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber the sections within Articles 725, 760, 770, 800, 820 & 830 as shown on the following table. For information, the following are pro forma rewrites of the Articles assuming that the individual proposals are accepted.

[Recommendation of Proposal 16-5 is shown on page 2422]

Insert Table Here

(Table shown on page 2742)

Insert Table 770.61 Here

(Table shown on page 2742)

Insert Artwork (Figure 770.61) Here

Substantiation:

Section 2.4.1 of the 2001 National Electrical Code Style Manual states:
2.4.1 Parallel Numbering Within Similar Articles. To the extent possible, Code-Making Panels are encouraged to use the same section numbers (and part numbers, where applicable) for the same purposes within articles covering similar subjects.
The CMP 16 Editorial Task Group has prepared a series of proposals such that these Articles conform with the intent of the Style Manual. The Task Group includes myself, S. Egesdal, S. Kaufman, S. Johnson, J. Brunssen, G. Dorna, D. Pirkle and M. Wierenga. Work was undertaken after consultation with the TCC chairman.

Panel Meeting Action: Accept in Principle

The panel restructured this Article as shown in the pro forma rewrite. The panel accepts the restructure only. Text changes are addressed in other proposals. The restructure did not change any technical requirements. Restructuring was accomplished by a series of specific proposals.

Panel Statement:

The panel accepts this action to comply with Manual of Style NEC-2001, Section 2.4.1.
See actions on Proposals 16-11, 16-23, 16-25, 16-56, 16-14, 16-16.
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-6 Log #2285 NEC-P16 (770) **Final Action: Reject**

Submitter: Keith Sinclair, Romar Electric / Rep. Labor

Recommendation:

Add text as follows:
Pullboxes shall be located in any area where the conduit makes several bends that total more than 180°, to guarantee the optical fiber cable will not be bent too tightly while pulling slack into the pullbox.

Substantiation:

There is currently not a recommended degree of bends between pullboxes, other than in standard wiring 360° for fiber optic cabling.

Panel Meeting Action: Reject

Panel Statement:

The proposal does not provide technical justification for the recommendation.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-7 Log #2425 NEC-P16 **Final Action: Reject**
(770)

Submitter: Gregory Skaper, Panduit Corporation

Recommendation:

Revise Article 770 to "Optical Fiber Cables, Raceways and Routing Assemblies".
Add to 770.2 Definitions. Optical Fiber Routing Assembly. A system designed for the support and routing of listed optical fiber cables. The system may or may not incorporate covers.
Add "routing assemblies to any section referencing raceway".
Revise 770.6 FPN by adding UL 2024A.

Substantiation:

The addition of optical fiber cable routing assembly is needed to address current and future routing systems. A new category (optical fiber cable routing assemblies) initiated by UL (QBAA, UL2024A) still addresses the main concern of smoke and fire spread. These requirements (general purpose, riser and plenum) remain the same. This addition will allow manufacturers and industry, additonal routing products that still meet safety requirements.

Panel Meeting Action: Reject

Panel Statement:

The proposal is vague and does not provide specific sections where the changes are to be made. It does not meet the requirements for proposals as shown in NFPA 70-2002 on the page following the index, section entitled "Method of Submitting a Proposal to Revise the National Electrical Code."

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-5a Log #CP1604 NEC-P16Meeting Action: Accept **Final Action: Reject**
(770)

TCC Action: Reject

The Technical Correlating Committee advises that Article locations and reassignments are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Rejects" the Panel Action.
Code-Making Panel 16 has recommended relocating Article 770 on optical fiber into Chapter 8. Article 770 is used for communications, signaling, and remote control, as well as power at times. Where installed as a composite cable containing power conductors, these cables are classified as electrical cables and must be installed in accordance with other requirements of Chapters 1 through 7.

Submitter: Code-Making Panel 16

Recommendation:

Relocate Article 770 into Chapter 8 and renumber accordingly.

Substantiation:

The preponderance of applications of optical fiber cable are for communications. Recognizing that Article numbering is the responsibility of the TCC, the panel recommends that the TCC relocate Article 770 and move it to Chapter 8 as Article 870.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

KAHN: Systems that are covered by Articles 725, 760, 770, 800, 820, and 830 are frequently interconnected with power-limited wiring systems, 600 volts or less systems and greater than 600 volts systems. Optical fiber cables, raceways and equipment are being utilized for communications, lighting and in conjunction with those systems included in Chapter 7 as well as those in Chapter 8.
90.2 and 90.3 describe the applicability of the various chapters of the Code.
Moving Article 770 into Chapter 8 modifies the intent of the code to cover all electrical installations uniformly. Chapter 8 originally was intended to cover those installations made by the telephone industry. Today, the same installers that are doing the power wiring, power-limited wiring and fire alarm system wiring are installing fiber optics wiring.
If Article 770 is moved to Chapter 8, 90.2 and 90.3 ought to be changed such that the use of the code is uniform.

16-8 Log #2383 NEC-P16 **Final Action: Reject**
(770-2)

Submitter: Gregory Skaper, Panduit Corporation

Recommendation:

Revise the definition of optical fiber raceway to:
"A raceway designed for enclosing and routing listed optical fiber cables. The raceway may allow for cable addition without cover removal."

Substantiation:

With the current definition of raceway, new designs of optical fiber raceway products can not comply with the newly revised UL 2024 for construction requirements (gaps and openings). This has placed a hardship on both the manufacturer and customer who is driving for easy addition or removal of fiber cable from the system. By definition, enclosure is for the protection of accidental contact with energized conductors. Optical fibers are not energized conductors. The optical fiber raceway definition needs to be redefined to meet the needs of both current and future products driven by industry. This revision will allow split covers and other designs which facilitate easy lay of cable and still maintain cable protection.

Panel Meeting Action: Reject

Panel Statement:

The change proposed by the submitter would result in a definition for an optical fiber raceway that is inconsistent with the definition of raceway as contained in Article 100. Further, the scope of Article 770 is the "… installation of optical fiber cables and raceways" and "… does not cover the construction of optical fiber cables and raceways."

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-10 Log #328 NEC-P16 **Final Action: Accept**
(770-2–Point of Entrance)

Submitter: Stanley Kaufman, OFS

Recommendation:

Modify the definition of Point of Entrance as follows:
Point of Entrance. The point at which the ~~wire or~~ cable emerges from an external wall, from a concrete floor slab, or from a rigid metal conduit or an intermediate metal conduit grounded to an electrode in accordance with 800.40(B).

Substantiation:

Article 770 has no wires, only cables.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-9 Log #1078 NEC-P16 **Final Action: Accept in Principle**

(770-2–Air Duct, Air-Handling Unit Room Plenum, Apparatus Casing Plenum, Ceiling Cavity Plenum, Duct Distribution Plenum, Raised Floor Plenum, 800.2 and 820.2)

TCC Action:

The Technical Correlating Committee understands that the Standards Council has given primary responsibility to the Technical Committee on Air-Conditioning for combustible materials in plenums in cooperation with other committees including the National Electrical Code Committee.

The Chair of the Technical Correlating Committee will work with the Chair of the Technical Committeee on Air-Conditioning and appoint a Task Group to review the proposals affecting correlation between Code-Making Panels 3, 16, and the Technical Committeee on Air-Conditioning.

In addition, the Technical Correlating Committee directs that this proposal be referred to the NFPA Committee on Air-Conditioning for comment.

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panels 1 and 3 for information.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Adopt the following definitions:

Air Duct. A conduit for conveying air.

Air-Handling Unit Room Plenum. An individual room containing an air-handling unit(s) used to gather return air from various sources and combine the return air within the room for returning to the air-handling unit.

Apparatus Casing Plenum. A fabricated plenum and apparatus casing used for supply, return, or exhaust air service.

Ceiling Cavity Plenum. The space between the top of finished ceiling and the underside of the floor or roof above where used to supply air to the occupied area, or to return or exhaust from the occupied area.

Duct Distribution Plenum. A duct enclosure used for the multiple distribution or gathering of ducts or connectors.

Raised Floor Plenum. The space between the top of the finished floor and the underside of a raised floor where used to supply air to the occupied area, or to return or exhaust air from or from the occupied area.

Substantiation:

These terms are used in proposals for Articles 770, 800, and 820 and need to be defined. The source of all the definitions is NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems.

Panel Meeting Action: Accept in Principle

Accept the proposal but change the definition of Air Duct to:

"A conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilating equipment, but not including the plenum."

Also include each of these definitions in 800.2 and 820.2.

Panel Statement:

The panel has substituted the current definition for Air Duct. The substituted definition is from NFPA 90A-2002; the original definition came from NFPA 90A-1999. These definitions also apply to articles 800 and 820.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no definitions of "air duct, air-handling unit room plenum, apparatus casing plenum, ceiling cavity plenum, duct distribution plenum, or raised floor plenum" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter has not furnished any substantiation for the use of these terms except that they are in other proposals. The terms are not presently used in the code. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

OHDE: The NEC already adequately covers wiring in spaces that provide environmental air - - whether these spaces are air ducts, air conditioning rooms, ceiling cavities, or raised floor cavities - - in 300.22 (B) and 300.22 (C). Additional definitions may create additional confusion. Other codes should not be deciding on the typed of wiring methods to be used in these spaces. The electrical experts are capable of doing this and it is covered quite well in 300.22. The more we let those outside of the NEC make these decisions the more we weaken adoption of the NEC. In addition, we could make the change and there is nothing that requires a jurisdiction to even adopt 90A.

16-11 Log #61b NEC-P16 (770-3) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete "Locations and" from the title of these sections to make the section titles "Other Articles."

Substantiation:

The current titles are not in agreement with the 2001 National Electrical Code Style Manual sections 2.5 and 3.3.5.
In the 2002 NEC, the following sections all have the title "Other Articles": 225.2; 372.3; 402.2; 445.3; 500.3; 505.3; 518.3; 545.2; 547.3; 604.3; 650.2; 668.3; 705.2 and 720.2.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-5.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-12 Log #1752 NEC-P16 (770-3) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

770.3 Locations and Other Articles.

Circuits and equipment shall comply with 770.3(A) and (B). Only those sections of Article 300 referenced in this article shall apply to optical fiber cables and raceways.

(A) Spread of Fire or Products of Combustion. The requirements of 300.21 for electrical installations shall also apply to installations of optical fiber cables and raceways. The accessible portion of abandoned optical fiber cables shall not be permitted to remain.

(B) Ducts, Plenums, and Other Air-Handling Spaces. The requirements of 300.22 for electric wiring shall also apply to installations of optical fiber cables and raceways where they are installed in ducts or plenums or other ~~space used for environmental air~~ air-handling spaces. Type OFNP and OFCP cables and plenum optical fiber raceways shall be permitted in plenums, including ceiling cavity plenums and raised floor plenums. Wiring methods installed in a plenum space shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the plenum space.

Exception: As permitted in 770.53(A).

Substantiation:

[Text of Proposal 16-12 substantiation is shown on page 2425]*

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of cables in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

This proposal's requirement that "Wiring methods installed in plenum space shall be permitted to extend not more than 150mm (6 in.) beyond the limits of the plenum space." would prohibit all wiring methods used in plenum space from general use. It would prohibit a raceway from being used anywhere except in a plenum space (with a 6 inch extension). It would also prohibit plenum cable from being used anywhere except in a plenum (with a 6 inch extension). Consequently, to wire a telephone from a terminal room to an office could require non-plenum cable to be used up to the plenum, a splice to plenum cable for traversing the plenum, and then another splice to reach an outlet. This provision of the proposal conflicts with the provisions for the use of raceway in Chapter 3 and the substitutions of plenum cable for other lower-fire-rated cables permitted in Articles 770, 800, 820 and 830.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-13 Log #468 NEC-P16 **Final Action: Accept**
(770-3(A), 800.52 (B), 820.3 (A), 830.3 (A))

Submitter: Stanley Kaufman, OFS

Recommendation:

Replace "shall not be permitted to remain" with "shall be removed".

Substantiation:

The requirement for the removal of abandoned cables is currently stated as, "The accessible portion of (cable type) cables shall not be permitted to remain." "Shall not be permitted to remain" is a convoluted way of saying, "shall be removed".
Section 3.3.1.2 of the 2001 NEC Style Manual states, "Use simple declarative sentence structure...".
Keep it simple!

Panel Meeting Action: Accept

Panel Statement:

This requirement in 800.52(B) has been moved to new section 800.3 in Proposal 16-75.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-14 Log #69 NEC-P16 **Final Action: Accept**
(770-3(B), 770.53, 800.53 & 820.53)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 770.53; 800.53 and 820.53 to be 770.61; 800.61 and 820.61, respectively.
Renumber Tables 770.53; 800.53 and 820.53 to 770.61; 800.61 and 820.61, respectively.
Renumber Figures 770.53; 800.53 and 820.53 to 770.61; 800.61 and 820.61, respectively.
Delete the column "References" in Tables 800.53 and 820.53.
In 770.3(B) Exception, change "770.53(A)" to "770.61(A)."
Revise 770.53(E) to 770.61(E) to read as follows:
(E) Cable Trays. Listed optical fiber cables shall be permitted to be installed in cable trays.
FPN: It is not the intent to require that these optical fiber cables be listed specifically for use in cable trays.
In the initial sentence of 770.53 (new 770.61) change "770.53(A)" to "770.61(A)".
In 770.53(C) (new 770.61(C)), change "770.53(A)" to 770.61(A)".
In 770.53(F) (new 770.61(F)), change "770.53" to "770.61".
In the first sentence of 800.53 (new 800.61), change "800.53(A)" to "800.61(A)" and "800.53(G)" to "800.61(G)".
In 800.53(E) (new 800.61(E)), change "800.53(A)" to "800.61(A)" and "800.53(E)(1)" to "800.61(E)(1)".
In 800.53(G) (new 800.61(G)), change "800.53" to "800.61".
In 800.53(G) FPN (new 800.61(G) (FPN), change "800.51" to "800.83".
Renumber Figure 800.53 to Figure 800.61.
In 800.53(F) (new 800.61(F)) change, "800.51(J)" to "800.82(l)".
In the initial sentence of 820.53 (new 820.61), change "820.53" to "820.61" twice.
In 820.53(B) (new 820.61(B)), change "820.53" to "820.61".
In 820.53(D) (new 820.62(D)), change "820.53" to "820.61" twice.

Substantiation:

The title of Section 725.61 is "Applications of Listed Class 2, Class 3, and PLTC Cables". The title of Section 760.61 is "Applications of Listed PLFA Cables". This change places all application requirements into sections number xxx.61, in the same place within the article. Table 770.53 does not have a "References" column; it is not needed in Tables 800.53 and 820.53 either.
This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-5.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-15 Log #369 NEC-P16 **Final Action: Accept**
(770-3(B), 820.3(B) & 830.3 (B))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

The Technical Correlating Committee requests that the Panel review the language of the Proposal with respect to stating a requirement in 820.3(B) and 830.3(B). This action will be considered by the Panel as a Public Comment.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise 725.3(C) and 760.3(B) as follows:

770.3(B) Ducts, Plenums, and Other Air-Handling Spaces. The requirements of 300.22 for electric wiring shall also apply to installations of optical fiber cables and raceways where they are installed in ducts or plenums or other space used for environmental air. Type OFNP and OFCP cables and plenum optical fiber raceways shall be permitted in ceiling cavity plenums and raised floor plenums.

~~Exception: As permitted in 770.53(A).~~

820.3(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22, ~~where~~ for coaxial cables installed in ducts or plenums or other spaces used for environmental air, ~~shall apply~~. Type CATVP cables shall be permitted in ceiling cavity plenums and raised floor plenums.

~~Exception: As permitted in 820.53(A).~~

830.3(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22 ~~shall apply, where~~ for network-powered broadband communications cables installed in ducts or plenums of other spaces used for environmental air. Type BLP cables shall be permitted in ceiling cavity plenums and raised floor plenums.

~~Exception: As permitted in 830.55(B).~~

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and the development of smoke under standard fire exposures. The purpose of the limitation is to produce the risk of fire spread within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. This proposal prohibits the use on unlisted (non-fire-retardant) outside plant cable in plenums in order to correlate with NFPA 90A.

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

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums, or raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter has not furnished any technical substantiation to change the present usage of plenum cables. This proposal would narrow the already accepted use of plenum cables without any documentation. This submitter also uses the terms "ceiling cavity" and "raised floor" which are not presently in the code without substantiation.

Comment on Affirmative:

DORNA: Continued acceptance of this proposal resolves the conflict between the **NEC®** Articles 770, 800, and 820 and NFPA 90A-2002. The 2002 **NEC** does not correlate with NFPA 90A-2002, as follows. The **NEC** permits unrestricted quantities of plenum cable to be installed in ducts, plenums and other space used for environmental air, while NFPA 90A restricts plenum cable to ceiling cavity and raised floor plenums (other space used for environmental air).

The reasons for the NFPA 90A restrictions on wiring in ducts and plenums, other than ceiling cavity plenums and raised floor plenums, are quite practical. The purpose of the HVAC system is heating and air conditioning. Placing unrestricted amounts of cabling in these ducts and plenums, other than ceiling cavity plenums and raised floor plenums, could interfere with the HVAC system function. Think of a duct or duct distribution plenum choked with cable! Consider a damper in a duct with cables running through it!

NFPA 90A does have a provision for supplementary materials in or on an air distribution system. These supplementary materials are required to have a maximum flame spread of 25 and a maximum smoke developed rating of 50, which is identical to the requirement in the *Uniform Mechanical Code*, the *Standard Mechanical Code*, the *National Mechanical Code* and the *International Mechanical Code*. Types OFNP, OFCP, CMP, CATVP plenum cables do not meet the requirements for supplementary materials.

The **NEC** needs to correlate with NFPA 90A not only because NFPA 90A has primary responsibility for combustibles in air handling systems; it needs to correlate because the requirements in NFPA 90A are quite reasonable. The restrictions on wiring in ducts in NFPA 90A correlate well with the provisions of sections 300.22(B), which covers equipment and wiring in fabricated ducts. Clearly the only wiring that should be allowed in a fabricated duct or plenum is wiring associated with the function of the duct or plenum and meeting

the requirements of NFPA 90A for supplementary Materials.

The Panel should continue to accept the Technical Committee on Air Conditioning's proposals.

OHDE: Rewrite 820.3(B) and 830.3(B) to read the same as the proposed change to 770.3(B) to provide consistency.

16-17 Log #1611 NEC-P16 (770-6) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal and correlate the actions with Proposal 16-5. The Technical Correlating Committee recognizes that the numbering and lack of titles is not in accordance with the NEC Style Manual. This action will be considered by the Panel as a Public Comment.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise Section 770.6 as follows:

770.6 Raceways for Optical Fiber Cables. Raceways for optical fiber cable shall comply with 770.6.1 through 770.64.

770.61 Listed optical fiber cable shall be permitted to be installed in any type of listed raceway permitted in Chapter 3 where that listed raceway is installed in accordance with Chapter 3. Where optical fiber cables are installed within raceway without current-carrying conductors, the raceway fill tables of Chapter 3 and Chapter 9 shall not apply. Where nonconductive optical fiber cables are installed with electric conductors in a raceway, the raceway fill tables of Chapter 3 and Chapter 9 shall apply.

770.62 Listed optical fiber cable shall be permitted to be installed in listed plenum optical fiber raceway, listed riser optical fiber raceway or listed general-purpose optical fiber raceway installed in accordance with 770.53 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing shall apply.

770.63 Listed plenum optical fiber raceway, listed riser optical fiber raceway or list general-purpose optical fiber raceway installed in accordance with 770.53 shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

770.64 Unlisted underground or outside plant construction plastic innerduct entering the building from the outside shall be terminated and firestopped at the point of entrance.

Substantiation:

The purpose of this proposal it to:

- Eliminate the exception.
- Add a reference to 770.53 (Applications of Listed Optical Fiber Cables and Raceways)
- Explicitly permit plenum optical fiber raceway, riser optical fiber raceway and general-purpose optical fiber raceway to be used as innerduct. Innerduct is often used in optical fiber installation to provide a low-friction surface for easing the installation of cable.
- Delete the fine print note on listing requirements for optical fiber raceway because it is not needed in an applications section.
- Add a requirement for firestopping unlisted innerduct was added because these innerducts are typically made from non-fire-resisant polyethylene, a highly combustible material.

Panel Meeting Action: Accept in Principle

Change 770.6 to read as follows:

770.6 Raceways for Optical Fiber Cables. Raceways for optical fiber cable shall comply with 770.6.1 through 770.6.4.

770.6.1 Listed optical fiber cable shall be permitted to be installed in any type of listed raceway permitted in Chapter 3 where that listed raceway is installed in accordance with Chapter 3. Where optical fiber cables are installed within raceway without current-carrying conductors, the raceway fill tables of Chapter 3 and Chapter 9 shall not apply. Where nonconductive optical fiber cables are installed with electric conductors in a raceway, the raceway fill tables of Chapter 3 and Chapter 9 shall apply.

770.6.2 Listed optical fiber cable shall be permitted to be installed in listed plenum optical fiber raceway, listed riser optical fiber raceway or listed general-purpose optical fiber raceway installed in accordance with 770.53 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing shall apply.

770.6.3 Listed plenum optical fiber raceway, listed riser optical fiber raceway or list general-purpose optical fiber raceway installed in accordance with 770.53 shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

770.6.4 Unlisted underground or outside plant construction plastic innerduct entering the building from the outside shall be terminated and firestopped at the point of entrance.

Panel Statement:

Reference 770.53 has been changed to 770.61 by proposal 16-14.

The panel made corrections to typos from original proposal.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-16 Log #70 NEC-P16 **Final Action: Accept**
(770-6, 770.82 (new) & 770.83 (new))

TCC Action:

The Technical Correlating Committee understands that subsequent proposals may modify this Proposal.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete 770.51 Listing Requirements for Optical Fiber Cables and Raceways.
Renumber "770.51" in 770.6 exception to "770.83".
Delete the fine print note in 770.6.
Create a new section VI "Listing Requirements":
VI. Listing Requirements.
770.82 Optical Fiber Cables. Optical fiber cables shall be listed in accordance with 770.82(A) through (D).
(A) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be marked Type OFNP or Type OFCP respectively, and be listed as suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.
FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by defining maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.
(B) Types OFNR and OFCR. Types OFNR and OFCR nonconductive and conductive optical fiber riser cables shall be marked Type OFNR or Type OFNP respectively and be listed as suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.
(C) Types OFNG and OFCG. Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be marked Type OFNG or Type OFCG respectively, and be listed as suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.
FPN: One method of defining resistance to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(D) Types OFN and OFC. Types OFN and OFC nonconductive and conductive optical fiber cables shall be marked as Type OFN or Type OFC respectively, and be listed as suitable for general-purpose use, with the exception of risers, plenums, and other spaces used for environmental air, and shall also be listed as being resistant to the spread of fire.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables, and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
770.83 Optical Fiber Raceway. Optical fiber raceways shall be listed in accordance with 770.83(A) through (C).
FPN: For information on listing requirements for optical fiber raceways, see UL 2024, Standard for Optical Fiber Raceways.
(A) Plenum Optical Fiber Raceway. Plenum optical fiber raceways shall be listed as having adequate fire-resistant and low smoke-producing characteristics.
(B) Riser Optical Fiber Raceway. Riser optical fiber raceways shall be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.
(C) General-Purpose Optical Fiber Cable Raceway. General-purpose optical fiber cable raceway shall be listed as being resistant to the spread of fire.

Substantiation:

Currently, Listing Requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3 and Fire Alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-5.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-18 Log #2283 NEC-P16 **Final Action: Reject**
(770-6 Exception No. 1)

Submitter: Neil Lake, Power Plus Inc. / Rep. Labor

Recommendation:

Delete text as follows:
Exception No. 1: Raceways for optical fiber cables shall not exceed two quarter bends or 180° between boxes, cabinets, or other such enclosures, ...

Substantiation:

I am an apprentice and I took a test which asked a question on what was the maximum degrees of bend allowed in a conduit run for fiber optic cable. My answer was 360° as per Chapter 3 in the code book. My answer was wrong, and I was informed that it was 180 °.

Panel Meeting Action: Reject

Panel Statement:

There is no Exception No. 1 in 770.6. There are no references in the Exception to 180 degree bends.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Affirmative:

OHDE: The intent of the author should be acknowledged, at the least, in an FPN. The FPN should refer to the ANSI/TIA/EIA 569A Document. Specifically 569A 4.4.2.3 Bends.
During the installation of a communications raceway system that is specified as "569A Compliant," the ANSI/TIA/EIA Standards must be adhered to per the owners/end-users requirements. Even though this is not an issue of safety and 360 degrees of bend meets NEC having this FPN could help save the installing contractor and owner/end-user time and money as well as aid the AHJ in knowing what to look for.
Note: Supporting material is available for review at NFPA Headquarters.

16-19 Log #861 NEC-P16 **Final Action: Reject**
(770-7)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 770.7 as follows:
770.7 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an excess accumulation of cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 770.7 has been misinterpreted to mean that cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when 770.7 was introduced into the 1993 NEC. At that time CMP 16 stated in response to a similar proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 640.5, 725.5, 760.5, 800.5, 820.5, and 830.6.

Panel Meeting Action: Reject

Panel Statement:

No additional clarification of the existing provision has been provided. The proposal does not change the requirement.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-20 Log #857 NEC-P16 (770-8) **Final Action: Accept in Principle**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 770.8 as follows:

770.8 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 ~~structural components of the~~ building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D).

Substantiation:

Section 770.8 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (770.8). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables. It also makes "ceiling" plural. This is a companion proposal and is intended to correlate with similar proposals for 800.6, 820.6, 830.7, 640.6, 725.6, and 760.6.

Panel Meeting Action: Accept in Principle

Change 770.8 to read as follows:

770.8 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 straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D) and 300.11.

FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2001, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.

Panel Statement:

The panel modified the proposal to clarify the submitter's intent. Addition of the FPN incorporates Proposal 16-82 to accommodate a parallel structure throughout Articles 770, 800, 820 and 830.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

HUGHES: I feel conformance to 300.11 for this application is overly restrictive. I agree with all other elements of the proposal.

JONES: The submitter's proposed changes in the text did not clarify or change the requirements of 770.8. The panel added a reference to 300.11 to the text, but did not furnish any evidence or technical support that a safety issue exists justifying the reference to the additional installation requirements referenced in 300.11.

Comment on Affirmative:

BRUNSSEN: While I agree with the Panel's acceptance of the proposal, I do not agree with the new, added requirement that the installation conform to 300.11. 300.11 is appropriate for power cable assemblies that are heavier and larger than optical fiber (OF) cables. An OF cable may be only one-eighth in. in diameter, and does not carry the voltage and current associated with power cables. Modifications typically involve the installation of a single, or at most, a few additional OF cables. 300.11(A) docs not permit OF cables to be supported by ceiling grid support wires. However, approved hardware is currently available for this purpose. 300.11(C) does not permit cables to be used as a support. However, as a communications system evolves, OF cables are often installed over an extended period of time and lashed together in a "case assembly". It is overly restrictive to require that each addition of a single OF cable require installation of additional and separate supports.

JOHNSON: I agree with Mr. Brunssen's comments. I too, support the Panel's acceptance in Principle of the proposal, but feel that the reference to 300.11 is not appropriate. 300.11 deals with power cables that are heavier and larger than communications cables. A communications cable is smaller in diameter, lighter weight, does not carry the voltage and current associated with power cables, and, therefore, does not warrant the same precautions as power cables. Adopting the reference to 300.11 would no longer allow supporting cables by the ceiling grid support wires even though approved hardware is currently available for this purpose. 300.11(C) does not permit cables to be used as a support, which is a common practice in communications installations and is done without compromising the integrity of the previous work. It is overly restrictive to require that each addition of a single cable require installation of additional and separate supports.

16-21 Log #2626a NEC-P16 **Final Action: Accept in Part**
(770-8, 800.6, 820.6 & 830.7)

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise 770.8, 800.6 and 830.7 as shown below:
Mechanical Execution of Work. Cables and equipment shall be supported or secured in such a manner that the cable and equipment will not be damaged or create a hazard by normal use of the building.
FPN: One way to determine accepted industry installation practice for cables and equipment is to refer to nationally recognized standards such as the Standard for Installing Commercial Building Telecommunications Cabling ANSI/NECA/BICSI 568.

Substantiation:

The current wording of Section 800.6 is shown below. The other sections are identical except for the application.
"Communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the outer surface of ceiling and sidewalls shall be supported by the structural components of the building structure in such a manner that the cable is not be damaged by normal building use. Such cables shall be attached to structural components by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4(D)."
We eliminated the first sentence due to the fact that "neat" and "workmanlike" is vague and violates the NEC Style Manual. We eliminated the sentences; "Cables installed exposed on the outer surface of ceiling and sidewalls shall be supported by the structural components of the building structure in such a manner that the cable is not be damaged by normal building use. Such cables shall be attached to structural components by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable." Because literal reading would prevent the common industry practice of stapling wiring onto a nonstructural wall or a baseboard. Instead we have proposed a clearer alternative. We eliminated the last sentence by submission of a proposal to move it to the "locations" section.
The ANSI/NECA/BICSI standard provides installation requirements for installing communications cables, connectors, and associated hardware. This standard applies to data wiring in Article 725 (Class 2), optical fiber cables in Article 770, communications cables in Article 800, CATV cable in Article 820, and network-powered cables in Article 830.

Panel Meeting Action: Accept in Part

Refer to Proposals 16-20, 16-81, 16-160 and 16-216.

Panel Statement:

The panel modified the Mechanical Execution of Work in other proposals which were more comprehensive. The FPN was accepted; see panel action on Proposal 16-82.
800.6 becomes new 800.7.
820.6 becomes new 820.8.
830.7 becomes new 830.8.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-22 Log #3512 NEC-P16 **Final Action: Reject**
(770-24 (New))

Submitter: Leif O. Pihl Minneapolis, MN

Recommendation:

Add a new section 770.24 to read as follows:
770.24 Bending Radius.
FPN No. 1: If the manufacturers' specifications and/or guidelines for minimum bend radius are unknown, note that the industry defacto standard is to maintain a minimum radius of 20 x the diameter of the cable.
FPN No. 2: See also 770.6.

Substantiation:

There is no enforceable code in this Article/Section. The section number was chosen to conform to editorial practices in Articles 320 through 362 where "Bending Radius" and "Bends-How Made" are at Section "24".
When electricians lack the manufacturers' specifications, the above fine print notes are needed in order to give them a minimal "rule-of-thumb" to use when laying out the conduit runs. This will help safety by reducing the amount of last-minute conduit changes where suport distances, separation from AC conductors, and other requirements could be overlooked or ignored.
Note re item 5 below: Inclusion of the text as a fine print note is my own idea. However, the text is not of my own creation. It is derived from "Installation Strategies for Long term Cabling System Success", copyrighted 1995 by "Levitron Telecom". The original paragraph, quoted below, comes from page 4-4, section 4.5.2, General Installation Tips. The index at the front implies that the text was derived from "TIA 568A".
"Always follow the manufacturers guidelines for minimum bend radius and tension. Failure to do so may result in high attenuation (macrobends) and possible damage to the cable and fiber. Guidelines are normally supplied with the cable manufacturer specification sheets. If the bend radius specifications are unknown, the industry defacto standard is to maintain a minimum radius of 20 x the diameter of the cable.

Panel Meeting Action: Reject

Panel Statement:

No enforceable text has been proposed. Fine print notes are not enforceable text; they are added for clarification and reference.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

16-23 Log #66 NEC-P16 **Final Action: Accept**
(770-49, 800.49, 820.49)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Change the following references.
770.51 to 770.82
800.51 to 800.82
820.51 to 820.82

Substantiation:

This proposal correlates with other proposals moving the cable listing sections to 770.81, 800.81 and 820.81.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-5.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-24 Log #189 NEC-P16 **Final Action: Accept**
(770-49, 800.49, 820.49)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete sections 770.49, 800.49 and 820.49.

Substantiation:

These sections add no requirements to those already stated in the listing sections and are superfluous. They should be deleted.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-25 Log #67 NEC-P16 **Final Action: Accept**
(770-50)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 770.50 as follows:
770.50 Installation of Optical Fiber Cables. Listed optical fiber cables shall be installed as wiring within buildings.
Exception No. 1: Unlisted outside plant optical fiber cables shall be permitted where the length of unlisted outside plant optical fiber cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and its terminated in an enclosure.
FPN: Splice cases or terminal boxes, both metallic and plastic types, are typically used as enclosures for splicing or terminating optical fiber cables.
Exception No. 2: Unlisted nonconductive outside plant optical fiber cables shall be permitted where the unlisted nonconductive outside plant optical fiber cable enters the building from the outside and is run in raceway installed in compliance with Chapter 3.

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725, 760, 770, 800, 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3 and Fire Alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. This proposal revises Section 770.50 to cover installation requirements only since the listing requirements are covered in the proposed new Section 770.82.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-5.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-26 Log #866 NEC-P16 (770-50) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 770.50, Exception No. 1 as follows:

Exception No. 1: Unlisted outside plant optical fiber cables shall be permitted within buildings in spaces other than ceiling cavity plenums and raised-floor plenums. ~~Optical fiber cables shall not be required to be listed and marked where the~~ The length of the unlisted cable permitted within the building, measured from its point of entrance, ~~does~~ shall not exceed 15 m (50 ft). ~~and the~~ The unlisted cable shall enter~~s~~ the building from the outside and ~~is~~ shall be terminated in an enclosure.

Substantiation:

The NEC presently permits up to 50 ft of unlisted outside plant cable to be run into a building, but places no restriction on installing the unlisted cables in air handling spaces where they could contribute to fire and smoke hazard. This proposal adds that restriction, further contributing to fire and smoke safety. A similar proposal is being submitted by the *NFPA Technical Committee on Air-Conditioning* to correlate with requirements for cables in plenums contained in NFPA 90A, that has primary jurisdiction for combustible materials used in air ducts and plenum spaces. This is a companion proposal and is intended to correlate with similar proposals for 800.50 and 820.50.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-31.

Panel Statement:

The current Code allows 50 feet of unlisted (outside plant) entrance cable in the building without restriction. This proposal would correct part of the problem by prohibiting entrance cable from being installed in ceiling cavity plenums and raised floor plenums. The solutions offered by Proposals 16-31, 16-107 and 16-170 are more comprehensive and include the submitter's intended wording; they prohibit unlisted (outside plant) entrance cable from being installed in risers, air ducts and all plenums. Accordingly, the panel has accepted Proposals 16-31, 16-107 and 16-170 and accepts this proposal in principle.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums and raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-29 Log #2570 NEC-P16 **Final Action: Accept in Principle**
(Table 770-50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Table 770.50 as shown below:

INSERT Table 770.50 HERE

(Table shown on page 2749)

Substantiation:

This proposal is a companion proposal to the limited fire hazard cable proposals for change to Sections 770.51 and 770.52 in order to correlate with the cable listing requirements in NFPA 90A-2002.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a cable designator that is not presently in the code without any substantiation. See negative ballot on 16-33.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-28 Log #1660 NEC-P16 **Final Action: Accept in Part**
(Table 770-50, 770.51, 770.53, Table 800.50, 800.51, 800.52, 800.53, Table 800.53, Table 820.53, and Table 830.58)

TCC Action:

The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the action taken on Proposal 3-172. This action will be considered by the panel as a public comment.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to Types OFNG, OFCG, and CMG in the Code. Specifically delete:

645.5(5)(c) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM and MP (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R ~~or G.~~ Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.

Table 725.61 Delete CMG.

760.61(D) FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, ~~CMG~~, CM), see 800.51.

Table 760.61 Delete CMG.

Table 770.50 Delete the rows for OFNG and OFCG cables.

~~770.51(C) Types OFNG and OFCG. Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.~~

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

770.53(B)(2) Types ~~OFNG~~, OFN, ~~OFCG~~, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

770.53(B)(3) Types ~~OFNG~~, OFN, ~~OFCG,~~ and OFC cables shall be permitted in one- and two- family dwellings.

770.53(C) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 770.53(A) and (B) shall be Type ~~OFNG~~, OFN, ~~OFCG~~, or OFC. Such cables shall be permitted to be installed in listed general-purpose optical fiber raceways.

Table 770.53 Delete OFNG and OFCG.

Table 800.50 Delete the row for CMG.

800.51~~(C) Type CMG. Type CMG general-purpose communications cable shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.~~

800.52(D) Cable Trays. Types MPP, MPR, ~~MPG~~, and MP multipurpose cables and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be permitted to be installed in cable trays. Communications raceways, as described in 800.51, shall be permitted to be installed in cable trays.

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

800.53(C) Distributing Frames and Cross-Connect Arrays. Listed communications wire and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be used in distributing frames and cross-connect arrays.

800.53(D) Cable Trays. Types MPP, MPR, ~~MPG~~, and MP multipurpose cables and Types CMP, CMR, ~~CMG~~, and CM communications cables shall be permitted to be installed in cable trays.

800.53(E)(1) General. Cables shall be Type ~~CMG or~~ Type CM. Listed communications general-purpose raceways shall be permitted. Only Types ~~CMG~~, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.

800.53(G) FPN: For information on Types CMP, CMR, ~~CMG~~, CM, and CMX cables, see 800.51.

Table 800.53 Delete CMG.

Table 820.53 Delete CMG.

Table 830.58 Delete CMG.

Substantiation:

The NEC TCC in its action on comment 16-98 for the 2002 NEC overturned CMP sixteen's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."

There are no requirements or specifications for the use of general-purpose "G" cables (OFNG, OFCG, CMG, MPG) versus the communications cables already specified. Consequently CMP 16 is obliged to follow the TCC directive and accept this proposal.

We believe that general-purpose "G" cables should be permitted to continue to be in the NEC. We recommend that the Code panel accept this proposal with a request to the TCC that it reconsider its position on inclusion of products that do not have specific application rules in the NEC. These cables were established because of an effort to harmonize the NEC and the Canadian Electrical Code. Richard Biermann, the TCC chairman, and Roy Hicks, the CEC head, submitted the proposals. A copy of one of their proposals is attached for reference. It's a shame that the current position of the TCC requires the removal of "G" cables from the Code.

General-purpose "G" cables could be retained if the TCC would change its position as follows:

The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC unless inclusion in the NEC is for purposes of correlating with other codes.

Panel Meeting Action: Accept in Part

The panel accepts the portions of the proposal that deal with the articles under its jurisdiction.

The panel accepts the portions of the proposal that deal with the articles under its jurisdiction.

Panel Statement:

Panel 16 favors correlation and harmonization and recommends that the TCC reconsider its position as requested in the proposal. Upon direction from the TCC, the TC would restore G cables in the Comment cycle.

In transcribing the submitted material to the panel, there were omissions and the panel subsequently received a copy of the original submitted proposal which included a copy of a proposal for the 1993 Code submitted by RG Biermann, TCC Chairman, and RL Hicks, CEC Chairman, that proposed the establishment of G cables for harmonizing the US and Canadian Codes. At that time, and today, there are no unique applications for Type G cables in the NEC. Additionally, Figure 800.53 illustrates that Types CM and CMG have identical applications.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

770.51 becomes new 770.82.
770.53 becomes new 770.61.
800.51 becomes new 800.82.
800.52 (*) becomes new 800.55.
800.53 becomes new 800.61.
820.53 becomes new 820.61.
830.58 becomes new 830.55.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Affirmative:

DORNA: There are no requirements or specifications for the use/application of general-purpose "G" cables (OFNG, OFCG, CMG, MPG) versus the communications cables already specified. Consequently, CMP 16 is obliged to follow the Technical Correlating Committee directive and accept this proposal. However, I believe that general-purpose "G" cables should be permitted to continue to be in the NEC.

I recommend that the Technical Correlating Committee reconsider its position on inclusion of products that do not have specific use/application rules in the NEC. These cables were established because of an effort to harmonize the NEC and the Canadian Electrical Code (CEC). Mr. Richard Biermann, the Technical Correlating Committee chairperson, and Mr. Roy Hicks, the CEC head , submitted the proposals. It is a shame that the current position of the TCC requires the removal of "G" cables from the Code.

General-purpose "G" cables could be retained if the Technical Correlating Committee would change its position to read something like the following:

The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC unless inclusion in the NEC is for purposes of correlating/harmonizing with other codes.

KAHN: While I agree with the Panel Action, I believe that Type G cables should be retained in the NEC for correlation and harmonization as stated in the Panel Statement. The Technical Correlating Committee should reconsider their action on Comment 16-98 to the 2002 ROP relative to listing requirements and be consistent with their prior directives.

16-27 Log #1610 NEC-P16 **Final Action: Accept**
(Table 770-50, 800.50 and 820.53)

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

In Tables 770.50, 800.50, and 820.53 delete the column headed "Reference".

Substantiation:

The "Reference" column is not needed since the cable markings tables are adjacent to the listing requirements in each article. Keep it simple!

Panel Meeting Action: Accept

820.53 becomes new 820.61.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-30 Log #445 NEC-P16 **Final Action: Accept in Principle**
(770-50 Exception No. 1)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise text as follows:

Exception No. 1: Unlisted outside plant ~~Optical~~ optical fiber cables shall be permitted within buildings in spaces other than ceiling cavity plenums and raised floor plenums, ~~not be required to be listed and marked~~ where the length of the unlisted cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. The permission to use plenum cables in air ducts and plenums, other than ceiling cavity and raised floor plenums is proposed to be deleted to correlate with NFPA 90A.

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

Panel Meeting Action: Accept in Principle

See panel action on 16-31.

Panel Statement:

The current Code allows 50 feet of unlisted (outside plant) entrance cable in the building without restriction. This proposal would correct part of the problem by prohibiting entrance cable from being installed in ceiling cavity plenums and raised floor plenums. The solutions offered by Proposals 16-31, 16-107 and 16-170 are more comprehensive and include the submitter's intended wording; they prohibit unlisted (outside plant) entrance cable from being installed in risers, air ducts and all plenums. Accordingly, the panel has accepted Proposals 16-31, 16-107 and 16-170 and accepts this proposal in principle.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums and raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-31 Log #1075 NEC-P16 **Final Action: Accept**
(770-50 Exception No. 1)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise Section 770.50 Exception No. 1 as follows:

Exception No. 1: Unlisted outside plant optical fiber cables shall be permitted within buildings in spaces other than risers, air ducts, ceiling cavity plenums, raised floor plenums, duct distribution plenums, apparatus casing plenums, and air-handling unit room plenums where the length of unlisted optical fiber cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the unlisted outside plant optical fiber cable enters the building from the outside and is terminated in an enclosure.

Substantiation:

Unlisted outside plant entrance cables are sometimes run in risers, ducts and plenums. When the 50-foot exemption for outside plant cable was adopted, it was assumed that the entrance cable would go into an equipment room. It was not envisioned that the unlisted cable, which is not fire resistant, would run up a riser, in an air duct or plenum.

Panel Meeting Action: Accept

Panel Statement:

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "spaces other than risers, air ducts, ceiling cavity plenums, raised floor plenums duct distribution plenums, apparatus casing plenums and air-handling unit room plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-32 Log #2630 NEC-P16 **Final Action: Accept in Part**
(770-50 Exception No. 3)

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise 770.50 Exception No. 3 as shown below:

Exception No. 3: Nonconductive optical fiber cables shall not be required to be listed and marked where the cable enters the building from the outside and is run in raceway systems installed in compliance with any of the following Articles in Chapter 3~~.~~; Article 342 Intermediate Metal Conduit; Type IMC, Article 344, Rigid Metal Conduit; Type RMC, Article 352, Rigid Nonmetallic Conduit; Type RNC, Article 358, Electrical Metallic Tubing; Type EMT, and Article 362, Electrical Nonmetallic Tubing, Type ENT.

Substantiation:

The listing requirements of 770.50 are:

Optical fiber cables in a building shall be listed as being suitable for the purpose, and cables shall be marked in accordance with Table 770.50.

Exception No. 1: Optical fiber cables shall not be required to be listed and marked where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure.

FPN: Splice cases or terminal boxes, both metallic and plastic types, are typically used as enclosures for splicing or terminating optical fiber cables.

Exception No. 2: Conductive optical fiber cable shall not be required to be listed and marked where the cable enters the building from the outside and is run in rigid metal conduit or intermediate metal conduit and such conduits are grounded to an electrode in accordance with 800.40(B).

Exception No. 3: Nonconductive optical fiber cables shall not be required to be listed and marked where the cable enters the building from the outside and is run in raceway installed in compliance with Chapter 3.

The listing requirements of Article 800 were the model for these requirements. The Article 800 listing requirements (800.50) are:

Communications wires and cables installed as wiring within buildings shall be listed as being suitable for the purpose and installed in accordance with 800.52. Communications cables and undercarpet communications wires shall be marked in accordance with Table 800.50. The cable voltage rating shall not be marked on the cable or on the undercarpet communications wire.

FPN: Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications.

Exception No. 1: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

Exception No. 2: Listing and marking shall not be required where the cable enters the building from the outside and is continuously enclosed in a rigid metal conduit system or an intermediate metal conduit system and such conduit systems are grounded to an electrode in accordance with 800.40(B).

Exception No. 3: Listing and marking shall not be required where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure or on a listed primary protector.

FPN No. 1: Splice cases or terminal boxes, both metallic and plastic types, are typically used as enclosures for splicing or terminating telephone cables.

FPN No. 2: This exception limits the length of unlisted outside plant cable to 15 m (50 ft), while 800.30(B) requires that the primary protector be located as close as practicable to the point at which the cable enters the building. Therefore, in installations requiring a primary protector, the outside plant cable may not be permitted to extend 15 m (50 ft) into the building if it is practicable to place the primary protector closer than 15 m (50 ft) to the entrance point.

Exception No. 4: Multipurpose cables shall be considered as being suitable for the purpose and shall be permitted to substitute for communications cables as provided for in 800.53(G).

FPN No. 1: Cable types are listed in descending order of fire resistance rating, and multipurpose cables are listed above communications cables because multipurpose cables may substitute for communications cables.

FPN No. 2: See the referenced sections for permitted uses.

The definition of point of entrance, from 770.2 Definitions:

Point of Entrance. The point at which the wire or cable emerges from an external wall, from a concrete floor slab, or from a rigid metal conduit or an intermediate metal conduit grounded to an electrode in accordance with 800.40(B).

Article 800 has an identical definition.

Exceptions No. 1 and 2 in 770.50 and Exception No. 2 in 800.50 recognize that rigid metal conduit systems and intermediate metal conduit systems provide ample current carrying capability to carry a fault current in case the metallic elements of the cables are energized, for example, by a power cross.

Exception No. 3 recognizes that a power cross is not possible if the entering optical fiber cable has no conductive members and consequently allows nonconductive entrance cable to be run in any raceway installed and listed per Chapter 3. While Exception No. 3 address the issue of fault current (there isn't any) it does not adequately deal with fire protection.

Unlisted outside plant communications and optical fiber cables are not fire-resistant. The predominant materials in these cables are olefins, polyethylene, polypropylene and oil-based filling (waterproofing) compounds. Recognition of the fire risk of outside plant cables is the basis for the listing requirements for building cables.

In case of a fire in the building, rigid metal and intermediate metal raceway provides fire protection for the outside plant cables. Exception No. 3 to 770.50, by allowing any raceway from Chapter 3, allows some raceway systems that could be expected to provide sufficient fire protection and others that are clearly inadequate. Metallic raceway systems that are not sealed, e.g., flexible metal conduit, and thin walled nonmetallic raceway systems would not provide sufficient fire protection. The proposed revision reduces the permitted raceway systems to those that should provide adequate fire protection.

Panel Meeting Action: Accept in Part

Revise 770.50 Exception No. 3 as shown below:

Exception No. 3: Nonconductive optical fiber cables shall not be required to be listed and marked where the cable enters the building from the outside and is run in raceway systems installed in compliance with any of the following Articles in Chapter ~~3~~.; Article 342 Intermediate Metal Conduit; Type IMC, Article 344, Rigid Metal Conduit; Type RMC, Article 352, Rigid Nonmetallic Conduit; Type

~~Intermediate Metal Conduit; Type IMC, Article 344, Rigid Metal Conduit; Type RMC, Article 352, Rigid Nonmetallic Conduit; Type~~ RNC and Article 358, Electrical Metallic Tubing; Type EMT.

Panel Statement:

770.50 Exception No. 3 is now Exception No. 2 in Proposal 16-25.

Electrical Nonmetallic Tubing, Type ENT, was removed from the original proposal because it does not provide adequate fire protection for outside plant cable.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-37 Log #1664 NEC-P16 (770-51) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

[Text of Proposal 16-37 recommendation is shown on page 2434]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 770.53 and similar sections in Articles 725, 760, 800, 820 and 830, permit plenum (OFNP, OFCP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, OFCP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, OFCP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, OFCP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types CL2D and CL3D, duct have significantly lower fuel load and lower smoke production than conventional Types CL2P and CL3P plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors offices, clean rooms, laboratories, strip malls etc

Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum, and in inaccessible ceiling cavity and raised floor plenums. It also permits duct cable to substitute for current plenum cable (OFNP, OFCP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to make it easier to understand. The cable marking table has been simplified. The requirement for the removal of abandoned cables has been removed because it is redundant.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Strike OFNG and OFCG from text in all locations (including Figures) in the proposal. Also, strike OFGG (typo in Figure).

Change "optical fiber duct cable(s)" to "optical fiber air duct cable(s)" in all locations.

In proposed section 770.53(A)(2)(b), change from "Listed plenum optical fiber raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C)." to "Listed plenum optical fiber raceways shall be permitted to be installed in other spaces used for environmental air as described in 300.22(C)."

Panel Statement:

General purpose cables were deleted by Proposal 16-28.

The panel added the word "air" to the term "duct cable(s)" because the term "duct cable(s)" is too general and could lead to confusion by the user. The term "air duct cable(s)" is much more descriptive. The term "air duct" is defined in NFPA 90A and in proposed revision to this Article. See Proposal 16-9.

The panel deleted the phrase " in
ducts and plenums as described in 300.22(B) and" because it permitted an installation that conflicted with 300.22(B) requirements.

Proposal 16-16 changes section 770.51 to 770.82 and 16-14 changes section 770.53 to 770.61.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: If approved this proposal would allow cables other than listed in 300.22 (B) to be installed in air duct used for environmental air. This proposal list cables that are not contained in 300.22 (B). There is no reason to place ANY combustible cable product in an environmental air duct and this proposal would violate 300.22 (B). This proposal could lead to the use of "air duct" as a raceway for uses other than "necessary for their direct action on, or sensing of, the contained air". The majority of installed air duct control and sensing is run external to the air duct and is run in raceway. In large air handling environments where there may be a need for internal wiring/cabling the cables are MC, MI or in metallic raceway per 300.22 (B). Most, if not all, applications of energy management control fit into the two methods listed above.

This proposal would also remove the requirement "Abandoned cables shall not be permitted to remain" within the plenum and riser sections that have been referenced here and replace it with "accessible portions of abandoned cables shall not be permitted to remain (from 770.3 (A) and 770.3 (B)). Most submitters to this proposal did not strike out or change the requirement for the removal of abandoned cables in plenums and risers. However this accepted proposal makes this change. There is no technical substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be

substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be aloud to remain. "Inaccessible" could have a broad scope of meaning to installers or the AHJ.

Every effort to remove abandoned cables should be made. Therefore the requirements of 300.22 (B) should be complied with. Most cables installed per 300.22 (B) can be removed.

Further the NEC already adequately covers wiring in spaces that provide environmental air -- whether these spaces are air ducts, air conditioning rooms, ceiling cavities, or raised floor cavities -- in 300.22(B) and 300.22(C). Other codes should not be deciding on the types of wiring methods to be used in these spaces. The electrical experts are capable of doing this, and it is covered quite well in 300.22. The more we let those outside of the NEC make these decisions the more we weaken adoption of the NEC. Also, we could make the change and there is nothing that requires a jurisdiction to even adopt 90A.

In addition, we do not find that the 90A Committee has even determined itself what minimum requirements are needed for testing electrical wiring. According to one of the speakers, 90A agreed to the proposals for coordination, but did not originate the proposals that introduce the
new "air duct" cable. This appears to be an effort designed to purport on one hand that this is what 90A wants; then when they take it to 90A this summer it will be presented as a "done deal" at the NEC. There is far from consensus among the NEC committees and Panel 16 appears to be the strongest proponents.

The real action that needs to be taken is to rename "plenum cable", because technically the Code does not permit it in 300.22(B) applications and it is being misapplied by designers."

Comment on Affirmative:

DORNA: Panels 3 and 16 received numerous proposals to establish listings and use requirements for a new type of cable having superior fire safety characteristics exceeding those of plenum cable. These cables are referred to as "limited fire hazard duct cable" in some of the proposals and "duct cable" in the others. Actions by Panel 16 changed the name to "air duct" cable. Panel 3 used the name "duct cable". Considering the volume and complexity of the proposals, I'm offering a guide to the proposals in my ballot comments in order to help the users of the Report on Proposals understand the relationships between the proposals. The "Primary Application" column shows the primary application proposed for the cable. Because of cable substitutions, other applications would also be permitted. Many of the proposals propose multiple actions, some of which are also proposed in simpler one and two-action proposals. The "Incorporates changes from other proposals" column shows those related proposals that are a foundation that the more comprehensive proposals build upon.

****INSERT TABLE L1664 DORNA AFF/C HERE****

(Table shown on page 2751)

The substantiation for proposals 16-43, 16-124 and 16-183 are comprehensive and should be referred to as additional substantiation for proposals 16-37, 16-112 and 16-177.

An additional comment specific to proposal 16-37 is that the panel action to permit optical fiber raceway to be used in "other spaces used for environmental air" needs to be changed to "ceiling cavity plenums and raised floor plenums" as was done for CATV raceway in proposal 16-194.

An issue not addressed in the proposals is a temperature rating for cables in hot air ducts. NFPA 90A permits hot air ducts to supply air at up to 121° C (250° F) (See Sections 4.3.10.2.3, 4.3.10.6.3 and 4.3.3.3.1). Consequently, cables used in hot air ducts will need to be rated for 121° C use. I am mentioning this concept here so it will be included in the public review of the proposals establishing air duct cable.

Continued acceptance of this proposal resolves the conflict between the **NEC®** Articles 770, 800, and 820 and NFPA 90A-2002. The 2002 **NEC** does not correlate with NFPA 90A-2002, as follows. The **NEC** permits unrestricted quantities of plenum cable to be installed in ducts, plenums and other space used for environmental air, while NFPA 90A restricts plenum cable to ceiling cavity and raised floor plenums (other space used for environmental air).

The reasons for the NFPA 90A restrictions on wiring in ducts and plenums, other than ceiling cavity plenums and raised floor plenums, are quite practical. The purpose of the HVAC system is heating and air conditioning. Placing unrestricted amounts of cabling in these ducts and plenums, other than ceiling cavity plenums and raised floor plenums, could interfere with the HVAC system function. Think of a duct or duct distribution plenum choked with cable! Consider a damper in a duct with cables running through it!

NFPA 90A does have a provision for supplementary materials in or on an air distribution system. These supplementary materials are required to have a maximum flame spread of 25 and a maximum smoke developed rating of 50, which is identical to the requirement in the *Uniform Mechanical Code*, the *Standard Mechanical Code*, the *National Mechanical Code* and the *International Mechanical Code*. Types OFNP, OFCP, CMP, CATVP plenum cables do not meet the requirements for supplementary materials.

The **NEC** needs to correlate with NFPA 90A not only because NFPA 90A has primary responsibility for combustibles in air handling systems; it needs to correlate because the requirements in NFPA 90A are quite reasonable. The restrictions on wiring in ducts in NFPA 90A correlate well with the provisions of sections 300.22(B), which covers equipment and wiring in fabricated ducts. Clearly the only wiring that should be allowed in a fabricated duct or plenum is wiring associated with the function of the duct or plenum and meeting the requirements of NFPA 90A for supplementary Materials.

The Panel should continue to accept the Technical Committee on Air Conditioning's proposals.

16-40 Log #1753 NEC-P16 (770-51) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

770.51 Listing Requirements for Optical Fiber Cables and Raceways.

Optical fiber cables shall be listed in accordance with 770.51(A) through (D), and optical fiber raceways shall be listed in accordance with 770.51(E) through (G).

(A) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in ~~ducts, plenums and other space used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by defining maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(B) Types OFNR and OFCR. Types OFNR and OFCR nonconductive and conductive optical fiber riser cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(C) Types OFNG and OFCG. Types OFNG and OFCG nonconductive and conductive general-purpose optical fiber cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistance to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

(D) Types OFN and OFC. Types OFN and OFC nonconductive and conductive optical fiber cables shall be listed as being suitable for general-purpose use, with the exception of risers, plenums, ~~and other spaces used for environmental air~~ including ceiling cavity plenums and raised floor plenums, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables, and Flexible Cords.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-40 substantiation is shown on page 2438]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal would list cables for unrestricted use in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-44 Log #2571 NEC-P16 (770-51) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 770.51 as shown below.

770.51 Listing Requirements for Optical Fiber Cables and Raceways.

Optical fiber cables shall be listed in accordance with 770.51(A) through (ED), and optical fiber raceways shall be listed in accordance with 770.51(FE) through (HG).

(A) Types OFND and OFCD. Types OFND and OFCD nonconductive and conductive optical fiber duct cables shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for materials installed in ducts and plenums.

(BA) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in ceiling cavity plenums and raised floor plenums ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by defining maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for installation in ceiling cavity plenums and raised floor plenums.

_Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; and "G" to "H".

Substantiation:

[Text of Proposal 16-44 substantiation is shown on page 2455]

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-34 Log #1146 NEC-P16 **Final Action: Accept in Principle**
(770-51, 770.53, Figure 770.53, Table 770.53 & Table 770.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Revise Section 770.51 as shown:

770.51 Listing Requirements for Optical Fiber Cables and Raceways. Optical fiber cables shall be listed in accordance with 770.51(A) through (E~~D~~) and optical fiber raceways shall be listed in accordance with 770.51 (F~~E~~) through (H~~G~~).

(A) Types OFND and OFCD. Types OFND and OFCD nonconductive and conductive optical fiber duct cables shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(B~~A~~) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in, ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by defining maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilation system for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; and "G" to "H".

Revise Table 770.50 as shown:

INSERT TABLE 770.50 HERE

(Table shown on page 2749)

Revise Sections 770.53(A) and (B), Table 770.53 and Figure 770.53 as shown. The other sections do not change.

770.53 Applications of Listed Optical Fiber Cables and Raceways. Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (E) or where cable substitutions are made as shown in 770.53(F).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type OFND or OFCD and shall be associated with the air duct system. Listed cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type OFND or Type OFCD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum. Types OFND and OFCD cable shall be mechanically protected to a height of 7 feet above the floor. Listed cables installed in compliance with Section 300.22 shall be permitted.

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

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(B) Riser. Cables installed in risers shall be as described in any of the following:

(1) Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type OFNR or OFCR. Floor penetrations requiring Type OFNR or OFCR shall contain only cables suitable for riser or plenum use. Abandoned cables shall not be permitted to remain. Listed riser optical fiber raceways shall be permitted to be installed in vertical riser runs in shaft from floor to floor. Only Types OFND, OFCD, OFNP, OFCP, OFNR and OFCR cables shall be permitted to be installed in these raceways.

(2) Types OFNG, OFN, OFCG, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) Types OFNG, OFN, OFCG, and OFC cables shall be permitted in one- and two-family dwellings.

FPN: See 300.21 for firestop requirements for floor penetrations.

Revise Table 770.53 as shown:

INSERT TABLE 770.53 HERE

(Table shown on page 2750)

Revise Figure 770.53 Cable Substitution Hierarchy, as shown below:

INSERT FIGURE 770.53 HERE

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 770.53 and similar sections in Articles 725, 760, 800, 820 and 830, permit plenum (OFNP, OFCP, CMP etc) cable to be installed in "ducts, plenums, and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the air-conditioning committee to restrict plenum cable (OFNP, OFCP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to as "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums". The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, OFCP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A:

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, OFCP, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish 'limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for use in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, OFCP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-39 Log #1704 NEC-P16 **Final Action: Accept in Principle**
(770-51, 770.53, Figure 770.53, Table 770.53 & Table 770.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Robert Dennelly, Avaya

Recommendation:

[Text of Proposal 16-39 recommendation is shown on page 2437]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 770.53 and similar sections in Articles 725, 760, 800, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, OFCP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, OFCP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, OFCP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, OFCP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, the article I have provided: "Burning Issue - New Plenum Cable Enhances Fire Safety" from the February 2001 issue of "Cabling Business Magazine," by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-

Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Note: Supporting Material available for review at NFPA headquarters.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-41 Log #1850 NEC-P16 **Final Action: Accept in Principle**
(770-51, 770.53, Figure 770.53, Table 770.53 & Table 770.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise Section 770.51 as shown below:

770.51 Listing Requirements for Optical Fiber Cables and Raceways.

Optical fiber cables shall be listed in accordance with 770.51(A) through (E~~D~~), and optical fiber raceways shall be listed in accordance with 770.51(F~~E~~) through (H~~G~~).

(A) Types OFND and OFCD. Types OFND and OFCD nonconductive and conductive optical fiber duct cables shall be listed as being suitable for use in ducts, plenums, and other space used for environmental and and shall also be listed as having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(B~~A~~) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in, ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; and "G" to "H".

Revise Table 770.50 as shown.

Insert Table 770.50 Here

(Table shown on page 2752)

Revise Sections 770.53(A) and (B), Table 770.53, and Figure 770.53 as shown. The other Sections do not change.

770.53 Applications of Listed Optical Fiber Cables and Raceways.

Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (E) or where cable substitutions are made as shown in 770.53(F).

(A) Air Ducts and Plenums.

Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type OFND or OFCD and shall be associated with the air duct system. Listed cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type OFND or Type OFCD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Types OFND and OFCD cable shall be mechanically protected to a height of 7 ft above the floor. Listed cables installed in compliance with Section 300.22 shall be permitted.

(b~~A~~) ~~Plenum.~~ Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type OFND, OFCD, OFNP or OFCP. Cables installed in inaccessible ceiling cavity plenums and raised floor plenums shall be Type OFND or OFCD. The accessible portion of ~~Abandoned~~ abandoned cables shall not be permitted to remain. Types OFND, OFCD, OFNP, OFCP, OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Types OFND, OFCD, OFNP and OFCP cables shall be permitted to be installed in these raceways.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(B) Riser. Cables installed in risers shall be as described in any of the following:

(1) Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type OFNR or OFCR. Floor penetrations requiring Type OFNR or OFCR shall contain only cables suitable for riser or plenum use. Abandoned cables shall not be permitted to remain. Listed riser optical fiber raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Types OFND, OFCD, OFNP, OFCP, OFNR and OFCR cables shall be permitted to be installed in these raceways.

(2) Types OFNG, OFN, OFCG, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) Types OFNG, OFN, OFCG, and OFC cables shall be permitted in one- and two-family dwellings.

FPN: See 300.21 for firestop requirements for floor penetrations.

Revise Table 770.53 as shown:

(2) Types OFNG, OFN, OFCG, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.
(3) Types OFNG, OFN, OFCG, and OFC cables shall be permitted in one- and two-family dwellings.
FPN: See 300.21 for firestop requirements for floor penetrations.
Revise Table 770.53 as shown:

Insert Table 770.53 Here

(Table shown on page 2752)

2 Revise Figure 770.53 Cable Substitution Hierarchy, as shown below:

Insert Artwork (Fig. 770.53) Here

Substantiation:

I am a member of the 90A Committee who worked on the 2002 90A Standard and voted in favor of the listing requirement for "limited combustible cable"*, which is now included in the document. However, the 2002 edition of the 90A Standard does not address the installation of wire and cable in ducts and plenums, other than ceiling cavity plenums and raised floor plenums.
Since there are field applications where cables are installed inside ducts and other than ceiling cavity plenums and raised floor plenums, it seems prudent that the Class of cables described herein should be required since they meet all the requirements for supplementary materials plus they meet all the requirements for use in ceiling cavity and raised floor plenums.
Since these cables are inaccessible, it is not feasible to remove them. Therefore, a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Based on extensive work by the FPRF, the Types of cables described herein have significantly lower fuel load and lower smoke production than conventional plenum cables Types.
An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording contained in proposals submitted by the 90A Committee. The cable substitution table and figure have been revised in order to make them easier to understand.
*Note: The term limited combustible was not used in the proposed text. The Standards Council, in a recently, directed that this term not be used for cables.
"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."
This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed for duct cable.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.
JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.
OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-43 Log #2441 NEC-P16 **Final Action: Accept in Principle**
(770-51 & 770.53, Figure 770.53 Table 770.53, & Table 770.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

[Text of Proposal 16-43 recommendation is shown on page 2449]

Substantiation:

[Text of Proposal 16-43 substantiation is shown on page 2451]

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-38 Log #1696 NEC-P16 **Final Action: Accept in Principle**
(770-51, 770.53, Figure 770.53, Tble 770.53 & Table 770.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Patricia Jenks, Krone Digital Communications

Recommendation:

[Text of Proposal 16-38 recommendation is shown on page 2435]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770,
820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.
NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.
Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air- Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-45 Log #3023 NEC-P16 **Final Action: Accept in Principle**
(770-51, 770.53, Table 770.53, Figure 770.53 and Table 770.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Bob Allen, Mohawk/DCT

Recommendation:

Revise Section 770.51 as shown below:

[Text of Proposal 16-45 recommendation is shown on page 2456]

Substantiation:

[Text of Proposal 16-45 substantiation is shown on page 2458]

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-33 Log #1068 NEC-P16 **Final Action: Accept in Principle**
(770-51, Table 770.50, 770.53, Table 770.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Hong Chen, OFS

Recommendation:

Revise 770.51 as shown below:

770.51 Listing Requirements for Optical Fiber Cables and Raceways.

Optical fiber cables shall be listed in accordance with 770.51(A) through (~~D~~E), and optical fiber raceways shall be listed in accordance with 770.51(~~E~~F) through (~~G~~H).

(A) Types OFND and OFCD. Types OFND and OFCD nonconductive and conductive optical fiber duct cables shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilation System for materials installed in ducts and plenums.

(~~A~~B) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other space used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:
"B" to "C", "D" to "E", "E" to "F", "F" to "G", "G" to "H".

Revise Table 770.50 as shown below:

Insert Table 770.50 Here

(Table shown on page 2749)

Revise Section 770.53, Table 770.53, and Figure 770.53 as shown below:

770.53 Applications of Listed Optical Fiber Cables and Raceways.

Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (~~E~~F) or where cable substitutions are made as shown in 770.53(~~F~~G).

(A) Air Ducts. Cables installed in air ducts shall be Type OFND or OFCD. Abandoned cables shall not be permitted to remain. Types OFNP, OFCD, OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted where associated with the air duct system they are installed in.

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

Renumber the remaining subparagraphs as follows:
"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G".

Insert Table 770.53 Here

(Table shown on page 2749)

Revise Figure 770.53 as shown below:

Insert Artwork (Figure 770.53) Here

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems. One of the issues addressed in their proposals is that NEC section 770.53 and similar sections in Articles 725, 760, 800, 820, and 830, permit plenum (OFNP, FPLP, CMP, etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP, etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not

plenum cable (FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and, 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in a duct. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditiioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37

DORNA: See my comment on Proposal 70-37.

16-35 Log #1150 NEC-P16 **Final Action: Reject**
(770-51, Table 770.50, 770.53, Table 770.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Richard Fransen, Daiken America, Inc.

Recommendation:

Revise 770.51 as shown below:

770.51 Listing Requirements for Optical Fiber Cables and Raceways. Optical fiber cables shall be listed in accordance with 770.51(A) through (~~D~~E), and optical fiber raceways shall be listed in accordance with 770.51 (~~E~~F) through (~~G~~H).

(A) Types OFND and OFCD. Types OFND and OFCD nonconductive and conductive optical fiber duct cables shall be listed as being suitable for use in ducts, plenums and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~A~~B) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in ~~ducts~~, ceiling cavity plenums and raised floor plenums~~, and other space used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maxmum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:
"B" to "C"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H".

Revise Table 770.50 as shown below:

INSERT TABLE 770.50 HERE

(Table shown on page 2750)

Revise Section 770.53, Table 770.53 and Figure 770.53 as shown below:

770.53 Applications of Listed Optical Fiber Cables and Raceways. Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (E) or where cable substitutions are made as shown in 770.53(G).

(~~A~~B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type OFND, OFCD, OFNP or OFCP. Abandoned cables shall not be permitted to remain. Types OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ~~ducts and~~ ceiling cavity plenums and raised floor pleums ~~as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C)~~. Only types OFND, OFCD, OFNP and OFCP cables shall be permitted to be installed in these raceways.

Renumber the remaining subparagraphs as follows;
"B" to "C". "C" to "D"; "D" to "E"' "E" to "F" "F" to "G".

INSERT TABLE 770.53 Cable Substitutions HERE

(Table shown on page 2750)

Revise Figure 770.53 as shown below:

INSERT FIGURE 770.53 HERE

Substantiation:

The Technical Committee on Air-Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, The Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA 90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed combustible plenum cable that is the equivalent of FPLP, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Panel Meeting Action: Reject

Panel Statement:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned Code-Making Panel 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC." This proposal does not contain a requirement for the use of duct cable.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-36 Log #1440 NEC-P16 **Final Action: Accept in Principle**
(770-51, Table 770.50, 770.53 Table 770.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Dan Kennefick, Ber-Tek a Nexans Company

Recommendation:

Revise 770.51 as shown below:

770.51 Listing Requirements for Optical Fiber Cables and Raceways. Optical fiber cables shall be listed in accordance with 770.51(A) through (~~D~~ E), and optical fiber raceways shall be listed in accordance with 770.51 (~~E~~ F) through (~~G~~ H).

(A) Types OFND and OFCD. Types OFND and OFCD nonconductive and conductive optical fiber duct cables shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System, for materials installed in ducts and plenums.

(~~A~~ B) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in ~~ducts,~~ ceiling cavity plenums and raised floor plenums~~, and other space used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke producing cable is by establishing an acceptable value of the smoke produced when tested n accordance with NFPA 262, 1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining subparagraphs as follows:
"B" to "C"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H".

Revise Table 770.50 as shown below:

INSERT TABLE 770.50 HERE

(Table shown on page 2751)

FPN No. 1: Cable types are listed in descending order of fire resistance rating. Within each fire resistance rating, nonconductive cable is listed first, since it may substitute for the conductive cable.

FPN No. 2: See the referenced sections for requirements and permitted uses.

Revise Section 770.53, Table 770.53, and Figure 770.53 as shown below.

770.53 Applications of Listed Optical Fiber Cables and Raceways. Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (~~E~~ F) or where cable substitutions are made as shown in 770.53(~~F~~ G).

(A) Air Ducts. Cables installed in air ducts shall be Type OFND or OFCD. Abandoned cables shall not be permitted to remain. Types OFNP, OFCD, OFNR, OFCR, OFNG, OFN, OFCD, and OFC cables installed in compliance with 300.22 shall be permitted where associated with the air duct system they are installed in.

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

Renumber the remaining subparagraphs as follows:
"B" to "C", "C" to "D", "D" to "E", "E" to "F", "F" to "G"

INSERT TABLE 770.53 HERE

(Table shown on page 2750)

Revise Figure 770.53 as shown below:

INSERT FIGURE 760.61 HERE
Figure 770.53 Cable Substitution Hierarchy

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, had made a series of proposals to correlate NFPA 70, National Electrical Code, with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 770.53 and similar sections in Articles 725, 760, 800, 820, and 830, permit plenum (OFNP, FPLP, CMP, etc.), cable to be installed in "ducts, plenums and other space used for environment air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP, etc.), to ceiling cavity and raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A? In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

(1) Listed noncombustible cable

(2) Listed limited combustible cable that has a maximum smoke developed index of 50

(3) Listed combustible plenum cable that is the equivalent of FPLP, CMP, etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not be qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.), because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. Also see my presentation from the BICSI 2002 Spring Conference.

Two paragraphs from the substantiation to the proposal from the Air-Conditioning Committee are shown below:

""The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

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

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.
OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-42 Log #2360 NEC-P16 **Final Action: Accept in Principle**
(770-51, Table 770.50 , 770.53, Table 770.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: J. R. Craig, ComNet

Recommendation:

Revise 770.51 as shown:

[Text of Proposal 16-42 recommendation is shown on page 2447]

Substantiation:

[Text of Proposal 16-42 substantiation is shown on page 2448]

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.
OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-46 Log #444 NEC-P16 **Final Action: Accept**
(770-51(A), 800.51 (A), 820.51 (A) & 830.5 (A) (2))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise Sections 770.51(A), 800.51(A) 820.51(A) and 830.5(A)(2) as follows:

770.51(A) Types OFNP and OFCP. Types OFNP and OFCP nonconductive and conductive optical fiber plenum cables shall be listed as being suitable for use in ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

800.51(A) Type CMP. Type CMP communications plenum cable shall be listed as being suitable for use in ceiling cavity plenums and raised floor ~~ducts,~~ plenums, ~~and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

820. 51(A) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ceiling cavity plenums and raised floor ~~ducts,~~ plenums~~, and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

830.(5)(A)(2) Type BLU, Type BLX, and Type BLP Cables. Network-powered broadband communications low-power underground cable, Type BLU; limited use network-powered broadband communications low-power cable, Type BLX; and network-powered broadband communications low-power plenum cable, Type BLP, shall be factory assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.11. Type BLU cables shall be jacketed and listed as being suitable for outdoor underground use. Type BLX limited-use cables shall be listed as being suitable for use outside, for use in dwellings, and for use in raceways and shall be listed as being resistant to flame spread. Type BLP cables shall be listed as being suitable for use in ceiling cavity plenums and raised floor ~~ducts,~~ plenums~~, and other spaces for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. The permission to use plenum cables in air ducts and plenums, other than ceiling cavity and raised floor plenums is proposed to be deleted to correlate with NFPA 90A.

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

Panel Meeting Action: Accept

Panel Statement:

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

770.51 becomes new 770.82.

800.51 becomes new 800.82.

820.51 becomes new 820.82.

830.5 becomes new 830.82.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums, or raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter has not furnished any technical substantiation to change the present usage of plenum cables. This proposal would narrow the already accepted use of plenum cables without any documentation. This submitter also uses the terms "ceiling cavity" and "raised floor" which are not presently in the code without substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

OHDE: Adds a conflict. Panel action ought to be "Accept in Principle" because the current action conflicts with action taken on proposals 16-37, 16-112, 16-177, and 16-211a.

Comment on Affirmative:

DORNA: See my Comment on Affirmative on Proposal 16-15 (Log #369).

16-47 Log #1732 NEC-P16 **Final Action: Accept in Principle**
(770-51(A), FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle

The submitter's intent was satisfied by Proposal 16-128.

Panel Statement:

The panel recognizes that the Technical Committee on Air-Conditioning has primary responsibility for combustibles in plenum spaces. Without compelling reason, the panel generally would accept a proposal from the air-conditioning committee rather than another source. The Panel accepts the recommended Fine Print Note wording from the Air Conditioning Committee (Proposal 16-128) and accepts this similar proposal "in principle" because the panel has no compelling reason to alter wording proposed by the air conditioning committee and the submitter has not provided sufficient substantiation to deviate from the wording proposed by the air conditioning committee.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment. If the Air Conditioning Committee prefers the wording in this proposal, it can indicate its preference in a comment for consideration at the ROC meeting in December.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-49 Log #1393 NEC-P16 (770-51(E), 800.51 (J)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Add a FPN to define adequate fire-resistant and low smoke-producing characteristics for raceway.

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for optical fiber and communications plenum raceways effectively defines raceways having "adequate fire-resistant characteristics" as raceways having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with UL 2024, Standard for Safety Optical-Fiber Cable Raceway. Likewise, it effectively defines raceways having "low smoke-producing characteristics" as raceways having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the same test.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air-Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable, and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal would editorially revise the listing requirements for plenum cable by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard.

Panel Meeting Action: Accept in Principle

Add a FPN to define adequate fire-resistant and low smoke-producing characteristics for raceway as follows:

"FPN: For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for optical fiber and communications plenum raceways effectively defines raceways having "adequate fire-resistant characteristics" as raceways having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with UL 2024, Standard for Safety Optical-Fiber Cable Raceway. Likewise, it effectively defines raceways having "low smoke-producing characteristics" as raceways having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the same test."

Panel Statement:

The submitter's recommendation was editorially clarified by the addition of "FPN:"

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of providing a FPN to define "adequate fire-resistant and low smoke-producing characteristics" there is no such definition found in NFPA 90A, Standard for the installation of Air-Conditioning and Ventilating Systems. The wording used in the Panel action is a requirement of NFPA 90A, not a definition.

16-48 Log #200 NEC-P16 **Final Action: Accept in Principle**
(770-51(E) & 800.51 (J) FPN (New))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, OFS

Recommendation:

Add a fine print note to read as follows:
FPN: One method of defining low smoke-producing raceway is by establishing an acceptable value of the smoke produced when tested in accordance with the test for Flame Propagation and Smoke Density Values (Plenum) in UL 2024, Standard for Optical Fiber Cable raceway, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant raceway is by defining maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

Substantiation:

The smoke and flame requirements for plenum raceways are in NFPA 90A, Standard for the Installation of Air-Condidtioning and Ventilating Systems. That requirement has been restated here to comply with the NEC Style Manual.

Panel Meeting Action: Accept in Principle

The submitter's intent was satisfied by Proposal 16-49.

Panel Statement:

The panel recognizes that the Technical Committee on Air-Conditioning has primary responsibility for combustibles in plenum spaces. Without compelling reason, the panel generally would accept a proposal from the air-conditioning committee rather than another source. The Panel accepts the recommended Fine Print Note wording from the Air Conditioning Committee (Proposal 16-49) and accepts this similar proposal "in principle" because the panel has no compelling reason to alter wording proposed by the air conditioning committee and the submitter has not provided sufficient substantiation to deviate from the wording proposed by the air conditioning committee.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment. If the Air Conditioning Committee prefers the wording in this proposal, it can indicate its preference in a comment for consideration at the ROC meeting in December.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-51 Log #931 NEC-P16 **Final Action: Accept in Principle**
(770-51(F) & 800.51 (K))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Add a fine print note as follows:
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the raceways pass the requirements of the Test for Flame Propagation (Riser) in UL 2024, Standard for Optical Fiber Cable Raceway.

Substantiation:

The proposed fine print note guides the user to the appropriate UL listing document.

Panel Meeting Action: Accept in Principle

See panel action on Proposal 16-50.

Panel Statement:

See panel statement on Proposal 16-50.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-50 Log #199 NEC-P16 **Final Action: Accept**
(770-51(F) & 800.51 (K) FPN (New))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, OFS

Recommendation:

Add a fine print note to read as follows:
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the raceways pass the requirements of the test for Flame Propagation (riser) in UL 2024, Standard for Optical Fiber Cable Raceway.

Substantiation:

The proposed Fine Print Note guides the user to the appropriate UL listing document.

Panel Meeting Action: Accept

Panel Statement:

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.
770.51 becomes new 770.82.
800.51 becomes new 800.82.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-52 Log #1073 NEC-P16 **Final Action: Accept in Principle**
(770-51(F) & 800.51 (K), FPN (New))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Add a fine print note as follows:
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the raceways pass the requirements of the Test for Flame Propagation (Riser) in UL 2024, Standard for Optical Fiber Cable Raceway.

Substantiation:

The proposed fine print note guides the user to the appropriate UL listing document.

Panel Meeting Action: Accept in Principle

See panel action on Proposal 16-50.

Panel Statement:

See panel statement on Proposal 16-50.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-54 Log #932 NEC-P16 **Final Action: Accept in Principle**
(770-51(G) & 800.51 (L))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Add a fine print note as follows:
FPN: One method of defining resistance to the spread of fire is that the raceways pass the requirements of the v Flame Test (General use) in UL 2024, Standard for Optical Fiber Cable Raceway.

Substantiation:

The proposed fine print note guides the user to the appropriate UL listing document.

Panel Meeting Action: Accept in Principle

See panel action on Proposal 16-53.

Panel Statement:

The submitter's intent was accomplished in Proposal 16-53.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-53 Log #198 NEC-P16 **Final Action: Accept**
(770-51(G) & 800.51 (L) FPN (New))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, OFS

Recommendation:

Add a fine print note to read as follows:
FPN: One method of defining resistance to the spread of fire is that the raceways pass the requirements of the Vertical-Tray Flame test (General use) in UL 2024, Standard for Optical Fiber Cable raceway.

Substantiation:

The proposed Fine Print Note guides the user to the appropriate UL listing document.

Panel Meeting Action: Accept

Panel Statement:

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.
770.51 becomes new 770.82.
800.51 becomes new 800.82.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-55 Log #1074 NEC-P16 **Final Action: Accept in Principle**
(770-51(G) & 800.51 (L), FPN (New))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Add a fine print note as follows:
FPN: One method of defining resistance to the spread of fire is that the raceways pass the requirements of the Vertical-Tray Flame Test (General use) in UL 2024, Standard for Optical Fiber Cable Raceway.

Substantiation:

The proposed fine print note guides the user to the appropriate UL listing document.

Panel Meeting Action: Accept in Principle

See panel action on Proposal 16-53.

Panel Statement:

The submitter's intent was accomplished in Proposal 16-53.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-56 Log #68a NEC-P16 **Final Action: Accept**
(770-52)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber sections 770.52; 800.52; 820.52 and 830.58 to be 770.55; 800.55; 820.55 and 830.55, respectively.
Renumber the reference to 800.52(D) in 725.61(C) to 800.55(D).
In the first sentence of 800.52 (new 800.55), change "800.52(A)" to "800.55(A)".
In the first sentence of 830.58 (new 830.55), change "830.58(A)" to "830.55(A)".
In 830.58(C) (new 830.55(C)), change "Table 830.58" to "Table 830.55" three times.

Substantiation:

This change lines up Section 725.55 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium Power Network-Powered Broadband Communications Cables, Section 760.55 Separation from Electric Light, Power, Class 1, NPLFA, and Medium Power Network-Powered Broadband Communications Circuit Conductors, Section 770.52 Installation of Optical Fibers and Electrical Conductors, Section 800.52 Installation of Communications Wires, cables, and Equipment, Section 820.52 Installation of Cables and Equipment and Section 830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods. These sections apply to similar requirements. With this change, all these sections will have the section number xxx.55.

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-5.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-57 Log #1288 NEC-P16 **Final Action: Reject**
(770-52(A) Exception (New))

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add a new Exception to read as follows:

Exception No. **: Where all of the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium power network-powered broadband communications circuits are separated from all of the optical fiber cables by a permanent barrier or listed divider.

Substantiation:

This is a new exception for 770.52(A) that would allow a optical fiber cable to share the same raceway, outlet box or enclosure as long as a permanent barrier or listed divider was in place. This language is similar to the language found in 800.52(A)(1).

This proposal defines that the barrier is a permanent function of the enclosure or that a removable or field installed divider that has been listed may be used to divide the optical fiber cable from the power circuits.

I believe the exception, if accepted, should either be numbered Exception No. 1 or No. 3.

Panel Meeting Action: Reject

Panel Statement:

Section 770.52(A) provides adequate flexibility for wiring with nonconductive fiber optic cable. Therefore, an additional Exception is not required.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-58 Log #2900 NEC-P16 (770-52(B)(6)) **Final Action: Accept in Principle**

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add 770.52(B)(6) to read as follows:
770.52(B)(6) Type ITC in compliance with Article 727.

Substantiation:

Type ITC cable has been permitted as an alternate wiring method for three Code cycles and industrial users have gained experience with ITC. This proposal gives industrial establishments flexibility to take fuller advantage of alternate wiring methods and allow additional intermixing of cables of similar energy levels without compromising practical safeguarding.

Panel Meeting Action: Accept in Principle

Change paragraph 2 of 770.52(A) to read:

"Nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium power network-powered broadband communications circuits, operating at 600 volts or less. Conductive optical fiber cables shall not be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium power network-powered broadband communications circuits."

Panel Statement:

The change incorporates the submitter's intent in that ITC be permitted to be installed with fiber(s) and nonconductive optical fiber cable(s) exclusively. A change to 770.52(A) is more appropriate.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

770-52 becomes new 770.55

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-60 Log #1754 NEC-P16 (770-53) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

770.53 Applications of Listed Optical Fiber Cables and Raceways.

Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (E) or where cable substitutions are made as shown in 770.53(F).

(A) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) . Cables shall be installed in ~~ducts, plenums, and other spaces used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type OFNP or OFCP. The accessible portion of abandoned optical fiber ~~Abandoned~~ cables shall not be permitted to remain. ~~Types OFNR, OFCR, OFNG, OFN, OFCG, and OFC cables installed in compliance with 300.22 shall be permitted.~~ Listed plenum optical fiber raceways shall be permitted to be installed in ~~ducts and plenums as described in 300.22(B) and in other spaces used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, as described in 300.22 (C). Only types OFNP and OFCP cables shall be permitted to be installed in these raceways.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-60 substantiation is shown on page 2459]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of Types OFNP, OFCP, CMP, MPP and CATVP cables in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

The portion of the proposal that deals with cables being removed was addressed in proposal 16-63.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-59a Log #CP1606 NEC-P16 (770-53) **Final Action: Accept**

Submitter: Code-Making Panel 16

Recommendation:

Revise the fourth sentence of 770.53(A) as shown below:
"Listed plenum optical fiber raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums."

Substantiation:

This change is required in order to correlate with NFPA 90A-2002.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JONES: The panel has not furnished any technical substantiation to change the present usage of plenum cables. This proposal would narrow the already accepted use of plenum cables without any documentation. This panel also uses the terms "ceiling cavity" and "raised floor" which are not presently in the code without substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.
OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664), 16-112 (Log #1665), and 16-177 (Log #1666).

16-59 Log #470 NEC-P16 (770-53, 800.53 and 820.53) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, OFS

Recommendation:

Delete "Plenum" and replace it with "Ceiling Cavity and Raised Floor Plenum".

Substantiation:

The NFPA Technical Committee on Air-Conditioning has proposed changing the titles of sections 725.61(A), 760.61(A), 770.53(A), 800.53(A) and 820.53(A) from "Plenum" to "Ceiling cavity plenums and raised floor plenums" in order to correlate with NFPA 90A. The term "plenum" in these figures also needs to be changed to reflect the requirement that "plenum" cables, Types CL2P, CL3P, FPLP, OFNP, OFCP, CMP and CATVP are suitable for use in ceiling cavity and raised floor plenums, but not in other plenums, for example, air-handling unit plenums.

Panel Meeting Action: Reject

Panel Statement:

This is no longer appropriate because of the correlation with NFPA 90A. This was achieved by Proposals 16-37, 16-112 and 16-177.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664), 16-112 (Log #1665), and 16-177 (Log #1666).

16-61 Log #2572 NEC-P16 **Final Action: Accept in Principle**
(770-53, Figure 770.53, & Table 770.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Sections 770.53(A) and (B), Table 770.53, and Figure 770.53 as shown. The other Sections do not change.

770.53 Applications of Listed Optical Fiber Cables and Raceways.

Nonconductive and conductive optical fiber cables shall comply with any of the requirements given in 770.53(A) through (E) or where cable substitutions are made as shown in 770.53(F).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type OFND or OFCD and shall be associated with the air duct system. Listed cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type OFND or Type OFCD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Types OFND and OFCD cable shall be mechanically protected to a height of 7 feet above the floor. Listed cables installed in compliance with Section 300.22 shall be permitted.

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

FPN: Plenums described in NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(B) Riser. Cables installed in risers shall be as described in any of the following:

(1) Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type OFNR or OFCR. Floor penetrations requiring Type OFNR or OFCR shall contain only cables suitable for riser or plenum use. Abandoned cables shall not be permitted to remain. Listed riser optical fiber raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Types OFND, OFCD, OFNP, OFCP, OFNR and OFCR cables shall be permitted to be installed in these raceways.

(2) Types OFNG, OFN, OFCG, and OFC cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) Types OFNG, OFN, OFCG, and OFC cables shall be permitted in one- and two-family dwellings.

FPN: See 300.21 for firestop requirements for floor penetrations.

Revise Table 770.53 as shown:

INSERT Table 770.53 HERE

(Table shown on page 2753)

Revise Figure 770.53 Cable Substitution Hierarchy as shown.

Substantiation:

[Text of Proposal 16-61 substantiation is shown on page 2468]

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor

plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.
OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-62 Log #2623 NEC-P16 **Final Action: Accept**
(Figure 770-53)

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Change "Cable A may be used in place of Cable B" to "Cable A shall be permitted to be used in place of Cable B".

Substantiation:

This change is needed to comply with the NEC Style Manual and to make Figure 770.53 editorially consistent with the cable substitution figures in Articles 725, 760, 800, and 820.

Panel Meeting Action: Accept

Panel Statement:

770.53 becomes new 770.61.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-63 Log #190a NEC-P16 **Final Action: Accept in Principle**
(770-53(A))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc.

Recommendation:

Delete the sentence: "Abandoned cables shall not be permitted to remain."

Substantiation:

The proposal corrects errors in the 2002 NEC. The panel intent was to require the removal of the accessible portions of cables only and that requirement is in sections 725.3(B), 760.3(A), 770.3(A), 800.52(B), 820.3(A) and 830.3(A). The error arose when CMP-16 accepted Comments 16-64 and 16-87 for the 2002 NEC in addition to other actions. These Comments converted numerous exceptions into positive language. In preparing the Comments, I used language from the 1999 NEC and did not incorporate the accepted Proposals and other Comments for the 2002 NEC.

Panel Meeting Action: Accept in Principle

Delete the sentence: "Abandoned cables shall not be permitted to remain." in 770.53 A and B.

Panel Statement:

There was an omission in the original proposal.
The panel renumbered 770.53 to new 770.61. See Proposal 16-14.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: This proposal would also remove the requirement "Abandoned cables shall not be permitted to remain" within the plenum and riser sections that have been referenced here and replace it with "accessible portions of abandoned cables shall not be permitted to remain (from 770.3 (A) and 770.3 (B)). Most submitters to this proposal did not strike out or change the requirement for the removal of abandoned cables in plenums and risers. However this accepted proposal makes this change. There is no technical substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be aloud to remain.
"Inaccessible" could have a broad scope of meaning to installers or the AHJ.
Every effort to remove abandoned cables should be made. Therefore the requirements of 300.22 (B) should be complied with. Most cables installed per 300.22 (B) can be removed.

16-65 Log #2085 NEC-P16 (770-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise text to read as follows:

770.53(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Types OFND, OFCD, OFNP or OFC. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type OFND or OFCD. The accessible portion of abandoned cables shall not be permitted to remain. Types OFND, OFCD, OFNP, OFCP, OFNR, OFCR, OFNG, OFN, OFCG, and OFC installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums. Only Types OFND, OFCD, OFNP and OFCP cables shall be permitted to be installed in these raceways.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types OFND and OFCD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Types OFNP and OFCP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-66 Log #2086 NEC-P16 (770-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise text to read as follows:

770.53(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Types OFND, OFCD, OFNP or OFC. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type OFND or OFCD. The accessible portion of abandoned cables shall not be permitted to remain. Types OFND, OFCD, OFNP, OFCP, OFNR, OFCR, OFNG, OFN, OFCG, and OFC installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums. Only Types OFND, OFCD, OFNP and OFCP cables shall be permitted to be installed in these raceways.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types OFND and OFCD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Types OFNP and OFCP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-67 Log #2087 NEC-P16 (770-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise text to read as follows:

770.53(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Types OFND, OFCD, OFNP or OFC. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type OFND or OFCD. The accessible portion of abandoned cables shall not be permitted to remain. Types OFND, OFCD, OFNP, OFCP, OFNR, OFCR, OFNG, OFN, OFCG, and OFC installed in compliance with 300.22 shall be permitted. Listed plenum optical fiber raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums. Only Types OFND, OFCD, OFNP and OFCP cables shall be permitted to be installed in these raceways.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types OFND and OFCD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Types OFNP and OFCP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-37.

Panel Statement:

See panel statement in Proposal 16-37.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-64 Log #441a NEC-P16 **Final Action: Accept in Principle**
(770-53(A), 800.53(A), 820.53(A) and 830.55(B))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise sections 770.53(A), 800.53(A), 820.53(A) and 830.55(B) as follows:

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

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

820.53(A) Ceiling cavity plenums and raised floor plenums ~~Plenum~~. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type CATVP. Abandoned cables shall not be permitted to remain. Types CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.

830.55(B) Ceiling cavity plenums and raised floor plenums ~~Ducts, Plenums, and Other Air Handling Spaces~~. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type BLP. Abandoned cables shall not be permitted to remain. Type BLX cable installed in compliance with 300.22 shall be permitted.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. The permission to use plenum cables in air ducts and plenums, other than ceiling cavity and raised floor plenums is proposed to be deleted to correlate with NFPA 90A.

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

Panel Meeting Action: Accept in Principle

Delete "Abandoned cables ... shall not be permitted to remain" in each of the 4 sections (770.53(A), 800.53(A), 820.52(A) and 830.55(B)). The remainder of the proposal is accepted.

Panel Statement:

See panel actions and statement in Proposals 16-63 and 16-141.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums, or raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22. I agree with deleting the statement "Abandoned cables … shall not be permitted to remain".

JONES: The submitter has not furnished any technical substantiation to change the present usage of plenum cables. This proposal would narrow the already accepted use of plenum cables without any documentation. This submitter also uses the terms "ceiling cavity" and "raised floor" which are not presently in the code without substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-37 (Log #1664) and 16-36 (Log #1440).

Comment on Affirmative:

DORNA: See my Comment on Affirmative on Proposal 16-15 (Log #369).

16-68 Log #465 NEC-P16 **Final Action: Reject**
(770-53(C), 800.53 (E) (I), 820.53 (D) (1), 830.55 (D) (1))

Submitter: Stanley Kaufman, OFS

Recommendation:

Add the word "exposed" as shown:
800.53(E)(1) General. Exposed ~~Cables~~ cables shall be Type CMG or Type CM. Listed communications general-purpose raceways shall be permitted. Only Types CMG, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.
820.53(D)(1) General. Exposed Type CATV shall be permitted.
830.55(D)(1) General. Exposed Type BLP or BM shall be permitted.
770.53(C) Other Wiring Within Buildings. Exposed ~~Cables~~ cables installed in building locations other than the locations covered in 770.53(A) and (B) shall be Type OFNG, OFN, OFCG, or OFC. Such cables shall be permitted to be installed in listed general-purpose optical fiber raceways.
760.61(C)(1) Exposed Type FPL shall be permitted.
725.61(E)(1) Exposed Type CL2 or CL3 shall be permitted.

Substantiation:

Editorial clarification inspired by a question from an installer.

Panel Meeting Action: Reject

Panel Statement:

The submitter used the word "exposed" referring to cable outside of raceway which does not agree with the definition in Article 100.
The definition of the word in Article 100 refers to "Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access."
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-69 Log #1289 NEC-P16 **Final Action: Reject**
(770-54)

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add new text to read as follows:

770.54 Optical Fiber Device and Equipment Mounting. Optical Fiber devices or equipment shall be mounted in listed boxes or assemblies designed for the purpose, and such boxes or assemblies shall be securely fastened in place. Boxes can either be completly enclosed or backless.
(A) Optical Fiber Devices and Equipment Mounted in Boxes. Optical Fiber devices or equipment shall be mounted in listed boxes and installed per 314.20.
(B) Optical Fiber Devices and Equipment Mounted on Covers. Optical Fiber device and equipment mounted to and supported by a cover shall be held rigidly against the cover which is mounted to the box.
(C) Wet Locations. Optical Fiber devices and equipment installed in a wet location shall use a cover that is listed for a wet location whether or not the device is in use.
FPN: See Article 100 for the definition of a "Wet Location".

Substantiation:

This proposal adds a new section to Article 770 addressing the mounting of devices or equipment to listed boxes. Currently, depending on the quality of workmanship, Optical Fiber devices or equipment have not been mounted to boxes that can support them. After several years device and/or covers that are mounted directly to the dry wall will become hazard because they have become loose and exposed. Optical Fiber devices used in a wet location, as defined in Article 100, shall have the connection protected from the elements by an in-use weatherproof cover.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided no data supporting an existing hazard. The submitter offers only an individual opinion that, depending on the quality of workmanship, equipment or devices mounted directly to a dry wall may, over time, loosen and become a hazard. The addition of listed boxes or assemblies will not, in itself, guarantee a hazard-free installation. The same quality of workmanship is necessary to help ensure a hazard-free equipment installation whether listed boxes are used or not.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

10-88 Log #2281 NEC-P10 **Final Action: Reject**
(780-3(C)(1))

Submitter: Ted L. Smith, Sr., Encompass Electrical Technologies-Rocky Mountains Inc.

Recommendation:

Revise text as follows:
780.3 Control. The control equipment and all power switching devices operated by the control equipment shall be listed and identified. The system shall operate in accordance with 780.2(A) through (D).
(A) Characteristic Electrical Identification Required. Outlets shall not be energized unless the utilization equipment first exhibits a characteristic electrical identification.
(B) Conditions for De-Energization. Outlets shall be deenergized when any of the following conditions occur:
(1) A nominal-operation acknowledgment signal is not being received from the utilization equipment connected to the outlet.
(2) A ground-fault condition exists.
(3) An overcurrent condition exists.
(C) Additional Conditions for De-Energization When an Alternate Source of Power Is Used. In addition to the requirements in 780.2(B), outlets shall be de-energized when any of the following conditions occur:
(1) The ~~grounded~~ earth conductor is not properly grounded.
(2) The ungrounded conductor is not at nominal voltage.
(D) Controller Malfunction. In the event of a controller malfunction, all associated outlets shall be de-energized.

Substantiation:

The word "Grounded" is often times misused or misunderstood in general application. Misunderstandings arise when discussing grounded conductors and equipment grounding conductors. The general use of the word "ground" or "grounded" is often mistakenly used for either situation. A change of the word "grounded" to the word "earth" will help to resolve this misunderstanding and allow for more accurate communication of requirements and standards.
I propose to change the word "grounded" to "earth" throughout the code book, when the word "grounded" is used in reference to a conductor.
The NFPA has repeatedly stated its desire for unified international standards. The NEC is a great standard with the proper code making process to make it timely and effective. Any move to make the NEC the international standard will improve the building industry. Many countries currently refer to the grounded conductor or neutral as the "earth" conductor. Changing the NEC to this terminology will help to move the NEC towards an international standard.
I believe this change will help with the understanding of the NEC, improve the user friendliness of the NEC and help make the NEC more palatable as an international standard.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 10-34.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

16-70 Log #124 NEC-P16 (800) **Final Action: Accept in Principle**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber the sections within Articles 725, 760, 770, 800, 820 & 830 as shown on the following table. For information, the following are pro forma rewrites of the Articles assuming that the individual proposals are accepted.

[Recommendation of Proposal 16-70 is shown on page 2471]

Insert Table Here

(Table shown on page 2754)

Insert Artwork (Figure 800.61) Here

Insert Table 800.61 Here

(Table shown on page 2754)

Substantiation:

Section 2.4.1 of the 2001 National Electrical Code Style Manual states:

2.4.1 Parallel Numbering Within Similar Articles. To the extent possible, Code-Making Panels are encouraged to use the same section numbers (and part numbers, where applicable) for the same purposes within articles covering similar subjects.

The CMP 16 Editorial Task Group has prepared a series of proposals such that these Articles conform with the intent of the Style Manual. The Task Group includes myself, S. Egesdal, S. Kaufman, S. Johnson, J. Brunssen, G. Dorna, D. Pirkle and M. Wierenga. Work was undertaken after consultation with the TCC chairman.

Panel Meeting Action: Accept in Principle

The panel restructured this Article as shown in the pro forma rewrite. The panel accepts the restructure only. Text changes are addressed in other proposals. The restructure did not change any technical requirements. Restructuring was accomplished by a series of specific proposals.

Panel Statement:

The panel accepts this action to comply with Manual of Style NEC-2001, Section 2.4.1.

See actions on Proposals 16-78, 16-80, 16-23, 16-131, 16-14, 16-75, 16-76, 16-91, 16-92, 16-100, 16-85,16 -87, 16-99, 16-101, 16-148, 16-149, 16-150, 16-84. See also 16-98a (Log #CP1600).

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-71 Log #2629 NEC-P16Meeting Action: Accept in Principle **Final Action: Reject**
(800-1,)

TCC Action: Reject

The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Rejects" the panel action. The revision to the Scope is too broad and may be interpreted to infinge upon the Scope of other articles.

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise text to read as follows:

800.1 Scope. This article covers telephone, signaling/communications circuits and equipment not in an information technology equipment room, telegraph (except radio), outside wiring for fire alarm and burglar alarm, and similar central station systems; and telephone systems not connected to a central station system but using similar types of equipment, methods of installation, and maintenance.

FPN No. 1: For further information for fire alarm, guard tour, sprinkler waterflow, and sprinkler supervisory systems, see Article 760.

FPN No. 2: For installation requirements of optical fiber cables, see Article 770.

FPN No. 3: For installation requirements for network-powered broadband communications circuits, see Article 830.

FPN No. 4: For installation requirements for equipment and circuits in an information technology equipment room, see Article 645.

Substantiation:

Communications and information technology have converged. Article 800 currently covers traditional telephony and digital telephone circuits. Article 800 also covers computer signaling when the computer signals are run in the same cable.

See [725.56(D)(1)]. The only information/data circuits in Article 725 are those between information technology equipment (computers) that are not run with the same cable with communications circuits. This proposal would simplify the code by bringing all data communications under Article 800. This convergence has already been partially recognized and addressed by the FPN in 800.4 which refers both computer and telephony listing standards. The cabling specified in Article 800 is used for both telephony and information technology. Designers of telecommunications structured cabling systems do not specify the cabling for use with telephony or information technology as these are now transparent (industries have converged).

The recent reorganization of the NEC Code Panels by the Technical Correlating Committee put Article 725 under the jurisdiction of Panel 3 and the communications articles (770, 800, 820, 830) under Panel 16. The data communications (remainder of text missing from proposal).

Panel Meeting Action: Accept in Principle

Replace existing 800.1 Scope and FPNs to now read:

"800.1 Scope. This article covers communications circuits that provide any combination of voice, audio, video, data, interactive services and equipment not in an information technology equipment room, telegraph (except radio), outside wiring for fire alarm and burglar alarm, and similar central station systems; and telephone systems not connected to a central station system but using similar types of equipment, methods of installation, and maintenance.

FPN No. 1: For further information for fire alarm, guard tour, sprinkler waterflow, and sprinkler supervisory systems, see Article 760.

FPN No. 2: For installation requirements of optical fiber cables, see Article 770.

FPN No. 3: For installation requirements for network-powered broadband communications circuits, see Article 830.

FPN No. 4: For installation requirements for equipment and circuits in an information technology equipment room, see Article 645."

Panel Statement:

The changes to the proposal are to comply with the Manual of Style.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Affirmative:

DORNA: If the Technical Correlating Committee accepts this change in scope it will also need to accept companion Proposal 3-156.

16-72 Log #933 NEC-P16 **Final Action: Accept**
(800-2)

TCC Action:

The Technical Correlating Committee directs the panel to reconsider the proposal because it includes a definition in a Fine Print Note. This action will be considered by the panel as a public comment.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Add a fine print note after the definition of cable as follows:
FPN: This definition of cable includes paired conductor cables and coaxial cables.

Substantiation:

When I was asked whether Article 800 covered coaxial cables, I had to refer to figures 760.61 and 820.53, which explicitly mention communications or multipurpose coaxial cable. A clarifying fine print note will be helpful.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-74 Log #3235 NEC-P16 **Final Action: Accept in Principle**
(800-2–Communications Circuit Integrity (CI) Cable (New))

Submitter: Edward Walton, Draka USA

Recommendation:

Add the following definition:
Communications Circuit Integrity (CI) Cable. Cable used for communications circuits that are critical to life safety, property protection, or emergency management in order to ensure continued communications for a specified time under fire conditions.

Substantiation:

This definition supports a term used in a proposal for Section 800.51.
A heightened interest in the ability to maintain communications throughout the entire time of an emergency has prompted numerous agencies to require that steps be taken to assure the circuit integrity and survivability of certain critical communications circuits during a fire in a building. It is vitally important that NFPA 70, National Electrical Code, offer a code-complying method for meeting these requirements.
Designers and installers of electrical systems, including communications systems, continually seek performance guidance from the NEC in order to assure the safety of electrical installations. It behooves the NEC to make certain that it makes suitable provisions to recognize specialized electrical components and installation methods that will allow building owners to meet requirements of other documents that seek to assure life safety, property protection, and emergency management.

Panel Meeting Action: Accept in Principle

Add the following definition to 800.2:
Communications Circuit Integrity (CI) Cable. Cable used in communications systems to ensure continued operation of critical circuits during a specified time under fire conditions.

Panel Statement:

The wording was altered to be consistent with a similiar provision in Article 760.2.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-73 Log #1072 NEC-P16 **Final Action: Accept**
(800-2, FPN (New))

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Add a fine print note after the definition of cable.
FPN: This definition of cable includes paired conductor cables and coaxial cables.

Substantiation:

When I was asked whether the Article 800 covered coaxial cables, I had to refer to Figures 760.61 and 820.53, which explicitly mention communications or multipurpose coaxial cable. A clarifying fine print note will be helpful.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-75 Log #71 NEC-P16 **Final Action: Accept**
(800-3 and 800.8)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Combine Sections 800.3; 800.8; 800.52(B) and 800.52(C) into a new section 800.3.
Delete 800.8; 800.52(B) and 800.52(C).
Renumber 800.52(D) and (E) to (B) and (C).
In 800.53(B)(3) (FPN) (new 800.61(B)(3) (FPN), change "800.52(B)" to "800.3(C)."
800.3 Other Articles.
(A) Hybrid Power and Communications Cables. The provisions of 780.6 shall apply for listed hybrid power and communications cables in closed-loop and programmed power distribution.
FPN: See 800.82(l) for hybrid power and communications cable in other applications.
(B) Hazardous (Classified) Locations. Communications circuits and equipment installed in a location that is classified in accordance with Article 500 shall comply with the applicable requirements of Chapter 5.
(C) Spread of Fire or Products of Combustion. Section 300.21 shall apply. The accessible portion of abandoned communications and multipurpose cables shall not be permitted to remain.
(D) Equipment in Other Space Used for Environmental Air.
Section 300.22(C) shall apply.

Substantiation:

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual. The task group has been writing proposals to increase the correlation between Articles 725, 760, 770, 800, 820 and 830. Of these articles, only Article 800 did not have an "Other Article" section. This proposal corrects that situation.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-76 Log #72 NEC-P16 **Final Action: Accept**
(800-4)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 800.4 to read:
800.4 Installation of Equipment. Equipment ~~intended to be~~ electrically connected to a telecommunications network shall be listed ~~for the purpose~~ in accordance with 800.80. Installation of equipment shall also comply with 110.3(B).
~~FPN: One way to determine applicable requirements is to refer to UL 1950-1993, Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment, third edition; UL 1459-1995, Standard for Safety, Telephone Equipment, third edition; or UL 1863-1995, Standard for Safety, Communications Circuit Accessories, second edition. For information on listing requirements for communications raceways, see UL 2024-1995, Standard for Optical Fiber Raceways.~~
Exception: This listing requirement shall not apply to test equipment that is intended for temporary connection to a telecommunications network by qualified persons during the course of installation, maintenance, or repair of telecommunications equipment or systems.

Substantiation:

This change removes the listing requirement from this section to correlate with moving all listing requirements to a new section.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-77 Log #2949 NEC-P16 (800-4) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee believes that the references in the Panel Action and Statement should be to Proposal 16-76.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.4 as follows:

800.4 Equipment. Equipment intended to be electrically connected to a telecommunications network shall be listed as being suitable for ~~the~~ that purpose. Installation of equipment shall also comply with 110.3(B).

Substantiation:

The Usability Task Group of the NEC Technical Correlating Committee has recommended that the term "listed for the purpose" be clarified by stating the expected purpose for which the equipment is to be listed. The proposed revision addresses the Usability Task Group recommendation and clarifies the purpose of the listing requirement. This is a companion proposal and is intended to correlate with similar proposals for 800.30(A)(1)(c), 800.32, 830.30(B)(2) and 830.30(B)(3).

Panel Meeting Action: Accept in Principle

See panel action on Proposal 16-150.

Panel Statement:

Proposal 16-150 accomplishes the submitter's purpose. The submitter proposed the words "that purpose" and Proposal 16-150 specifies the purpose.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-78 Log #62g NEC-P16 (800-5) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-79 Log #858 NEC-P16 (800-5) **Final Action: Reject**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.5 as follows:

800.5 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an excess accumulation of wires and cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 800.5 has been misinterpreted to mean that wires and cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when 800.5 was introduced into the 1993 NEC. At that time CMP 16 stated in response to a similar proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of wires and cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited wire and cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of wire and cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 640.5, 725.5, 760.5, 770.7, 820.5, and 830.6.

Panel Meeting Action: Reject

Panel Statement:

No additional clarification of the existing provision has been provided. The proposal does not change the requirement.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-80 Log #62h NEC-P16 (800-6) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-81 Log #851 NEC-P16 (800-6) **Final Action: Accept in Principle**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.6 as follows:

800.6 Mechanical Execution of Work. Communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the outer surface of ceilings and sidewalls shall be supported by the ~~structural components of the~~ building structure in such a manner that the cable ~~is~~ will not be damaged by normal building use. Such cables shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D).

Substantiation:

Section 800.6 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (800.6). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables. It also corrects a typo in the 2002 text, makes "ceiling" plural, and deletes the word "outer" for correlation with 820.6, 830.7, 640.6, 760.6, and 770.8. This is a companion proposal and is intended to correlate with similar proposals for 820.6, 830.7, 640.6, 725.6, 760.6, and 770.8.

Panel Meeting Action: Accept in Principle

Change 800.6 to read as follows:

800.6 Mechanical Execution of Work. Communications circuits and equipment 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 straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D) and 300.11.

FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2001, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.

Panel Statement:

The panel modified the proposal to clarify the submitter's intent. Addition of the FPN incorporates Proposal 16-82 to accommodate a parallel structure throughout Articles 770, 800, 820 and 830.

800.6 becomes new 800.8.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

HUGHES: I feel conformance to 300.11 for this application is overly restrictive. I agree with all other elements of the proposal.

JONES: The submitter’s proposal changes in the text did not add clarity or change to the requirements of Article 800.6. The panel added a reference to Article 300.11 to the text, but did not furnish any evidence or technical support that a need or a safety issue exists justifying the reference to the additional installation requirements of Article 300.11.

Comment on Affirmative:

BRUNSSEN: While I agree with the Panel's acceptance of the proposal, I do not agree with the new, added requirement that the installation conform to 300.11. 300.11 is appropriate for power cable assemblies that are heavier and larger than communications cables. A communications cable used for premises wiring is typically less than one-quarter inch in diameter, contains four separately insulated 26 AWG conductors, and operates at 48 volts DC with an available power of less than 100 volt-amperes. Modifications typically involve the installation of a single, or at most, a few additional communications cables. 300.11(A) does not permit communications cables to be supported by ceiling grid support wires. However, approved hardware is currently available for this purpose. 300.11(C) does not permit cables to be used as a support. However, as a communications system evolves, communications cables are often installed over an extended period of time and lashed together in a "cable assembly". It is overly restrictive to specify that each addition of a single communications cable require installation of additional and separate supports.

JOHNSON: See my Comment on Affirmative on Proposal 16-20.

16-82 Log #2611 NEC-P16 **Final Action: Accept**
(800-6, FPN (New))

Submitter: H. Brooke Stauffer, Nat'l Electrical Contractors Assn. (NECA)

Recommendation:

Add a new fine print note as follows:
FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2001, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.

Substantiation:

As presently written, 800.6 describes only a few of the important aspects of "neat and workmanlike" communications installations. Safety would be improved by providing an informational reference to a more comprehensive standard on the subject. Unlike the publications previously listed in the FPN to 800-6 (1999 NEC and previous editions) ANSI/NECA/BICSI 568-2001 is a true installation standard limited to installation concerns rather than defining product ratings and performance criteria.

Panel Meeting Action: Accept

Panel Statement:

800.6 becomes new 800.7.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

RAO: Installation standards are covered by the NEC. If additional standards are required by the product, they should be provided by the manufacturer. This FPN may require AHJs and contractors to purchase a publication that is redundant.

16-83 Log #1755 NEC-P16 **Final Action: Accept in Principle in Part**
(800-8)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:
800.8 Locations and Other Articles. ~~Hazardous (Classified) Locations~~
Communications circuits and equipment shall comply with 800.8 (A) through (E). ~~installed in a location that is classified in accordance with Article 500 shall comply with the applicable requirements of Chapter 5.~~
(A) Spread of Fire or Products of Combustion. Section 300.21. The accessible portion of abandoned communications circuits and equipment shall not be permitted to remain.
(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22, for communications circuits and equipment installed in ducts or plenums or other air-handling spaces. Type MPP and CMP cables shall be permitted for multipurpose cables and communications cables installed in plenums, including ceiling cavity plenums and raised floor plenums. Wiring methods installed in a plenum space shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the plenum space.
(C) Hazardous (Classified) Locations. Communications circuits and equipment installed in a location that is classified in accordance with Article 500 shall comply with the applicable requirements of Chapter 5.
(D) Corrosive, Damp, or Wet Locations. Sections 110.11, 300.6, and 310.9 where installed in corrosive, damp, or wet locations.
(E) Optical Fiber Cables. Where optical fiber cables are utilized for communications circuits or equipment, the cables shall be installed in accordance with Article 770.

Substantiation:

[Text of Proposal 16-83 substantiation is shown on page 2478]

Panel Meeting Action: Accept in Principle in Part

The panel accepts in principle establishment of "Other Articles" section in Article 800. This was accomplished in Proposal 16-75. The panel rejects the remainder of the proposal; see panel action in Proposal 16-12.

Panel Statement:

See panel action on Proposal 16-12. In addition, the panel rejects introduction of parts (D) and (E) of this proposal as the submitter did not provide substantiation for these additions.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-84 Log #78 NEC-P16 **Final Action: Accept**
(800 Part II)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Change the title of Part II from "Conductors Outside and Entering Buildings" to "Wires and Cables Outside and Entering Buildings".

Substantiation:

The title of Part II in Articles 820 and 830 is "Cables Outside and Entering Buildings". This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-85 Log #80 NEC-P16 **Final Action: Accept**
(800-10, 800.11, 800.12 & 800.13)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 800.10; 800.11; 800.12 and 800.13 to be 800.11; 800.12; 800.13 and 800.14, respectively.
In the first sentence of 800.11 (new 800.12), change "800.11(A)" to "800.12(A)".
In the first sentence of 800.12 (new 800.13), change "800.12(A)" to "800.12(A)".
In 800.12(B) (new 800.13(B)), change "800.12(A)" to "800.13(A)" twice.
In 800.30(A)(1), change "800.12(A) to 800.13(A) four times.

Substantiation:

With the proposed changes Sections 800.11 through 800.14 will line up with similar sections in Articles 820 and 830.
This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-86 Log #1408 NEC-P16 **Final Action: Reject**
(800-11(A)820.11(A), 830.12(A))

Submitter: Ronald E. Maassen, Lemberg Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 800.11(A) With Electric Light or Power conductors to add the word, "enclosure" after "handhole". The first sentence would then begin with, "Underground communications wires and cables in a raceway, handhole enclosure, or manhole".
Revise Section 820.11(A) Underground Systems to add the word, "enclosure" after "handhole". The first sentence would then begin with "Underground coaxial cables in a duct, pedestal, handhole enclosure, or manhole".
Revise Section 830.12(A) Underground Systems to add the word "enclosure" after "handhole". The first sentence would then begin with, "Underground network-powered broadband communications cables in a duct, pedestal, handhole enclosure, or manhole".

Substantiation:

For consistency adding enclosure to handholes will create uniformity.

Panel Meeting Action: Reject

Panel Statement:

"Handhole" is an industry-accepted term that has been in use for many years. It connotes access only by the hand and arm, as opposed to "manhole" that connotes access via the entire body. Adding the word "enclosure" neither adds to consistency nor uniformity, and may serve to confuse the industry that has used the familiar term "handhole" for so long.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-87 Log #82 NEC-P16 **Final Action: Accept**
(800-12(A), 800.13 (new))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 800.12(A) to read:
800.13(A) Insulation, Wires, and Cables. Communications wires and cables without a metallic shield, running from the last outdoor support to the primary protector, shall be listed. ~~as being suitable for the purpose and shall have current-carrying capacity as specified in 800.30(A)(1)(b) or 800.30(A)(1)(c).~~

Substantiation:

This change removes the listing requirement and correlates with the proposal to move all listing requirements into a new section.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-88 Log #3509 NEC-P16 **Final Action: Reject**
(800-12(B), FPN)

Submitter: Leif O. Pihl Minneapolis, MN

Recommendation:

Add a Fine Print Note to section 800.12(B) to read as follows:
FPN: See also Sections 300.3(C)(1), 820.52(A)(2) and 830.58(A)(2) for cable separation requirements.

Substantiation:

Electricians are often unaware of the different clearances that communication, coax and data cables need, both from each other and from AC power conductors. Electricians need this information when laying out the conduit runs. If the separation requirements are noticed late in the installation, last minute changes to conduit runs need to be made. I have noticed, upon more occasions that I can count, that when these clearances are pointed out late in the process that they are usually either ignored or resolved in a haphazard method that does not allow for proper conduit and/or cable support. Adding these cross-references will increase the chance that they will be aware of, and pay attention to these clearances earlier in the installation process.
This proposal, along with the other three (see below) will help safety by reducing these late changes where support distances, securing, and other requirements could then be overlooked or ignored.
Note: Similar proposed changes have been submitted for sections 300.3(C)(1)FPN, 800.12(B)FPN, 820.52(A)(2)FPN and 830.58(2)FPN. These four proposal work together.

Panel Meeting Action: Reject

Panel Statement:

Separation requirements are adequately covered in 800.12(B), 800.13, and 800.52(A)(1) and (2). Reference to 300.3(C)(1) is inappropriate as Chapter 8 stands alone (see 90.3) and the Chapter 8 rules are more stringent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-89 Log #2950 NEC-P16 **Final Action: Accept**
(800-30(A)(1)(c))

TCC Action:

The Technical Correlating Committee directs that the Panel clarify what the words "suitable for this purpose" mean, and clarify the Panel Statement on this Proposal renumbering this section to 800.80(A). This section was not moved to 800.80. Proposal 16-91 deletes 800.31 and moves it to 800.80(A). This action will be considered by the Panel as a Public Comment.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.30(A)(1)(c) as follows:
(c) Where insulated conductors in accordance with 800.12(A) or (B) are used to extend circuits to a building from other than a cable with metallic sheath member(s) if (1) the primary protector is listed as being suitable for this purpose, and (2) the connections of the insulated conductors to the exposed plant or the conductors of the exposed plant safely fuse on all currents greater than the current-carrying capacity of the primary protector, or associated insulated conductors and of the primary protector grounding conductor.

Substantiation:

The Usability Task Group of the NEC Technical Correlating Committee has recommended that the term "listed for the purpose" be clarified by stating the expected purpose for which the equipment is to be listed. The proposed revision addresses the Usability Task Group recommendation and clarifies the purpose of the listing requirement. This is a companion proposal and is intended to correlating with similar proposals for 800.4, 800.30(A)(1)(e), 800.32, 830.30(B)(2), and 830.30(B)(3).

Panel Meeting Action: Accept

Panel Statement:

800.30(A)(1)(c) was renumbered to 800.80 (A) in Proposal 16-150.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-90 Log #2954 NEC-P16 **Final Action: Accept**
(800-30(A)(1)(e))

TCC Action:

The Technical Correlating Committee directs that the Panel clarify what the words "suitable for this purpose" mean. This action will be considered by the Panel as a Public Comment.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.30(A)(1)(e) as follows:
(e) Where insulated conductors in accordance with 800.12(A) are used to extend circuits to a building from cable with an effectively grounded metallic sheath member(s) and if (1) the combination of the primary protector and insulated conductor is listed as being suitable for this purpose, and (2) the insulated conductors safely fuse on all currents greater than the current-carrying capacity of the primary protector and of the primary protector grounding conductor.

Substantiation:

The Usability Task Group of the NEC Technical Correlating Committee has recommended that the term "listed for the purpose" be clarified by stating the expected purpose for which the equipment is to be listed. The proposed revision addresses the Usability Task Group recommendation and clarifies the purpose of the listing requirement. This is a companion proposal and is intended to correlating with similar proposals for 800.4, 800.30(A)(1)(c), 800.32, and 830.30(B)(2) and 830.30(B)(3).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-91 Log #73 NEC-P16 **Final Action: Accept**
(800-31)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete Section 800.31.
Renumber the reference to 800.31 in 725.57 to 800.80(A).

Substantiation:

This change removes the listing requirement and correlates with the proposal to move all listing requirements to a new section.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-92 Log #74 NEC-P16 (800-32) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete Section 800.32.
Renumber the reference to 800.32 in 725.57 to 800.80(B).

Substantiation:

This change removes the listing requirement from this section and correlates with moving all listing requirements to a new section. Application requirements are merged into Section 800.30.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-93 Log #2951 NEC-P16 (800-32) **Final Action: Accept in Principle**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.32 as follows:
800.32 Secondary Protector Requirements. Where a secondary protector is installed in series with the indoor communications wire and cable between the primary protector and the equipment, it shall be listed ~~for the purpose~~ as being suitable for application with indoor communications wiring. The secondary protector shall provide a means to safely limit current to less than...

Substantiation:

The Usability Task Group of the NEC Technical Correlating Committee has recommended that the term "listed for the purpose" be clarified by stating the expected purpose for which the equipment is to be listed. The proposed revision addresses the Usability Task Group recommendation and clarifies the purpose of the listing requirement. This is a companion proposal and is intended to correlating with similar proposals for 800.4, 800.30(A)(1)(c), 830.30(B)(2), and 830.30(B)(3).

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-148 that accomplishes the submitter's intent.

Panel Statement:

See panel action on Proposal 16-148 which states the purpose of the listing.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-94 Log #1354 NEC-P16 **Final Action: Reject**
(800-33 Exception, 830.33 Exception (New))

Submitter: James M. Surratt, Duke Energy Corporation

Recommendation:

Add a new Exception:
Exception: Where network-powered cables terminate at locations where there is ground potential rise causing high shield currents, such as near power company substations, the shield is not required to be grounded but terminated in approved isolation equipment.

Substantiation:

Cables terminated in or between tie stations or substations have current flowing in the shield from voltage potentials due to ground potential rises. These currents become high enough to heat the cable causing failure and fire, especially during fault conditions. The resolution is the installation of approved isolation equipment at one end to break the shield current. The isolation equipment is UL approved and provides protection to equipment and personnel. See 90.2(B)(4), many communications buildings located outdoors, etc., are increasingly not under the exclusive control of the utility. We are now being inspected and inspectors require the cable shields grounded.

Panel Meeting Action: Reject

Panel Statement:

The current wording is sufficient since it permits the isolation of shield. The electrical environment at or near an electric power generating station or substation can be extremely severe during a phase-to-ground fault on the power distribution system. Fault current returning to the station or substation through the earth and the resistance of the station or substation ground mat can produce a large ground potential rise (GPR) with respect to remote earth. Conductors referenced to remote earth and brought into the station or substation can experience large currents during a power fault. However, it is not only the cable shield that is subject to this event, but the signal conductors contained within the cable as well. Special procedures and practices are employed by telecom utilities in serving such environments, and includes special treatment applied to the signal conductors, as well as the cable shield. One technique is the use of a dedicated cable, isolated from other telecom plant until it reaches the "remote drainage point", a location beyond the zone of influence of the GPR. The exception as proposed is misleading as it fails to fully address the complex issue of wire-line service to environments subject to high GPR.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-95 Log #1588 NEC-P16 (800-40) **Final Action: Reject**

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 5 for information.

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

Revise Section 800.40 as follows:

800.40 Cable and Primary Protector Grounding.

The metallic member(s) of the cable sheath, where required to be grounded by 800.33, and primary protectors shall be grounded as specified in 800.40(A) through (D).

(A) Grounding Electrode Conductor.

(1) Insulation. The grounding electrode conductor shall be insulated and shall be listed as suitable for the purpose.

(2) Material. The grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.

(3) Size. The grounding electrode conductor shall not be smaller than 14 AWG.

(4) Length. The primary protector grounding electrode conductor shall be as short as practicable. In one- and two-family dwellings, the primary protector grounding conductor shall be as short as practicable, not to exceed 6.0 m (20 ft) in length.

Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum primary protector grounding electrode conductor length of 6.0 m (20 ft), a separate communications ground rod meeting the minimum dimensional criteria of 800.40(B)(2)(2) shall be driven, the primary protector shall be grounded to the communications ground rod in accordance with 800.40(C), and the communications ground rod bonded to the power grounding electrode system in accordance with 800.40(D).

(5) Run in Straight Line. The grounding electrode conductor shall be run to the grounding electrode in as straight a line as practicable.

(6) Physical Damage. Where necessary, the grounding electrode conductor shall be guarded from physical damage. Where the grounding electrode conductor is run in a metal raceway, both ends of the raceway shall be bonded to the grounding conductor or the same terminal or electrode to which the grounding electrode conductor is connected.

(B) Electrode. The grounding electrode conductor shall be connected in accordance with 800.40(B)(1) and (B)(2).

(1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:

(1) The building or structure grounding electrode system as covered in 250.50

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52

(3) The power service accessible means external to enclosures as covered in 250.94

(4) The metallic power service raceway

(5) The service equipment enclosure

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is grounded to an electrode as covered in 250.32.

For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 800.30(B), shall be considered accessible.

(2) In Buildings or Structures Without Grounding Means. If the building or structure served has no grounding means, as described in 800.40(B)(1):

(1) To any one of the individual electrodes described in 250.52(A)(1), (2), (3), (4); or

(2) If the building or structure served has no grounding means, as described in 800.40(B)(1) or (B)(2)(1), to an effectively grounded metal structure or to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (1/2 in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning conductors as covered in 800.13 and at least 1.8 m (6 ft) from electrodes of other systems. Steam or hot water pipes or air terminal conductors (lightning-rod conductors) shall not be employed as electrodes for protectors.

(C) Electrode Connection. Connections to grounding electrodes shall comply with 250.70. Connectors, clamps, fittings, or lugs used to attach grounding conductors and bonding jumpers to grounding electrodes or to each other that are to be concrete-encased or buried in the earth shall be suitable for its application.

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the communications grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used. Bonding together of all separate electrodes shall be permitted.

Exception: At mobile homes as covered in 800.41.

FPN No. 1: See 250.60 for use of air terminals (lightning rods).

FPN No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.

Substantiation:

The revision will provide consistent use of the terms between chapter two and Article 800. The term "grounding conductor" is used in this Article and refers to a component of the grounding system that performs the task and function of a grounding electrode conductor. A similar change was made for consistency in Section 250.32 in the 2002 NEC. The sizing requirements for the grounding electrode conductor will continue to be specified from Article 800. It's required or permitted connection points to ground are also specified within Article 800 and should not change. The revision should provide consistency better identity of the conductor and its function. See also proposal to Section 250.66.

Panel Meeting Action: Reject

Panel Statement:

The term "grounding electrode conductor" is specific to the conductor used to connect the grounding electrode(s) to the equipment grounding conductor, to the grounded conductor, or to both, at the service (see Article 100, "grounding electrode conductor"). The conductor of 800.40 is a true grounding conductor, used to connect the primary protector (grounded circuit of the communications system), to the power service ground (see Article 100, "grounding conductor").

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-96 Log #846 NEC-P16 **Final Action: Accept**
(800-40(A)(4))

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Add fine print note to 800.40(A)(4) as follows:
"FPN: Similar grounding conductor length limitations applied at apartment buildings and commercial buildings will help to reduce voltages that may be developed between the building's power and communications systems during lightning events."

Substantiation:

When the 20-foot limitation was instituted in the 2003 NEC, apartment and commercial buildings were specifically not addressed as it was felt the predominant issue was in one- and two-family dwellings. In retrospect, some guidance should be provided for apartment and commercial buildings, without being overly restrictive because of intersystem bonding situations that may exist at these facilities. The proposed FPN provides guidance for the treatment of the cable and primary protector grounding conductor length at apartment and commercial buildings, consistent with the new 20-foot rule for one- and two-family dwellings, but does not place untenable restrictions on the actual length. This is a companion proposal and is intended to correlate with similar proposals for 820.40(A)(4) and 830.40(A)(4).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JOHNSON: The proposed maximum grounding conductor length of 20 ft was chosen somewhat arbitrarily. There was no evidence presented to indicate that the current requirement of "as short as practicable" has been less than sufficient from a safety standpoint.
TODD: This change is against the NEC style manual. The proposed FPN contains mandatory language.

16-97 Log #3178 NEC-P16 **Final Action: Reject**
(800-40(B)(1)(2))

Submitter: Eric Stromberg, The Dow Chemical Company

Recommendation:

Change "grounded" to "bonded".

Substantiation:

It doesn't matter if the water pipe is grounded. In order to fulfill the intended purpose of this section, the pipe must be bonded to the service grounding electrode system.

Panel Meeting Action: Reject

Panel Statement:

An interior metal piping system that meets the requirements of 250.52(A)(1) is considered acceptable for use as a grounding electrode. In this case the water pipe is definitely grounded. If it is not used as a grounding electrode, either out of choice or because it does not meet the criteria of 250.52(A)(1), then it must be bonded to the building or structure grounding electrode system per 250.104(A)(1). The interior metal water piping system is grounded through the bonding connection to the building or structure grounding electrode system. Either way the current text is appropriate.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-97a Log #CP1608 NEC-P16 **Final Action: Accept**
(800-40(C), 830.40(C))

Submitter: Code-Making Panel 16

Recommendation:

In 800.40(C), delete the second sentence.
In 830.40(C), delete the second sentence.

Substantiation:

Similar language should be used for similar requirements in all the articles of Chapter 8.
Section 250.70 provides the necessary requirements.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-98 Log #1622 NEC-P16 (800-40(D)) **Final Action: Reject**

Submitter: George Ritchie, City of Phoenix, AZ

Recommendation:

The last word in the paragraph should be changed from "permitted" to "required."

Substantiation:

All electrodes for a building must be at the same potential. See 250.58.

Panel Meeting Action: Reject

Panel Statement:

Article 250 requires the bonding together of all power grounding electrodes, but does not address other grounding electrodes such as the communications grounding electrode. In addition, Article 250 does not require that all grounding electrodes bonded together (e.g., see supplementary grounding electrodes in 250.54). The bonding requirement of 800.40(D) is specific to the communications grounding electrode where that electrode is separate from the power grounding electrode(s). The suggested change is beyond the scope of Chapter 8 as it would impose bonding requirements that are neither specific to communications nor presently addressed elsewhere in the Code.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-97b Log #CP1602 NEC-P16 (800-40(D)) **Final Action: Accept**

Submitter: Code-Making Panel 16

Recommendation:

Delete the last sentence of 800.40(D) which reads "Bonding together of all separate electrodes shall be permitted."

Substantiation:

This provides correlation with 820.40(D) and 830.40(D). The deleted sentence was not a requirement.
Similar language should be used for similar requirements in all the articles of Chapter 8.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-98a Log #CP1600 NEC-P16 (800-41, 800.42) **Final Action: Accept**

Submitter: Code-Making Panel 16

Recommendation:

Renumber Section 800.41 to 800.42 and change its title from "Primary Protector Grounding at Mobile Homes" to "Primary Protector Bonding and Grounding at Mobile Homes".
In 800.40(D) change "800.41" to "800.42".
In 800.42(B)(1) (new 800.42(B)(1)) change "800.41(A)" to "800.42(A)".

Substantiation:

This change aligns Section 800.41 with similar sections in Articles 820 and 830 and uses the term "bonding and grounding" consistently.
This change creates editorial consistency between Articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-99 Log #75 NEC-P16 **Final Action: Accept**
(800-48)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 800.48 as follows:
800.48 Raceways for Communications Wires and Cables. Where communications wires and cables are installed in a raceway, the raceway shall be either of a type permitted in Chapter 3 and installed in accordance with Chapter 3 or a listed nonmetallic raceways complying with 800.83 and installed in accordance with 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing apply.
Exception: Conduit fill restrictions shall not apply.

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3 and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. The section covering raceway is being changed and, therefore, the reference to that section must also be changed.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-100 Log #79 NEC-P16 **Final Action: Accept**
(800 Part V and 830 Part V)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Rename Article 800 Part V "Wires and Cables Within Buildings" from "Communications Wires and Cables Within Buildings" and rename Article 830 Part V "Cables Within Buildings" from "Wiring Methods Within Buildings."

Substantiation:

With this change, Article 770 Part III, Article 820 Part V and Article 830 Part V will all have the title "Cables Within Buildings" and Article 800 Part V will have the title "Wires and Cables Within Buildings". Only Article 800 has wires as a wiring/cabling method, so it needs to have a slightly different title in this section.
This change will improve editorial consistency between articles and comply with section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-101 Log #76 NEC-P16 (800-50) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 800.50 as follows:

800.50 Installation of Communications Wires and Cables. Listed communications wires and cables and listed multipurpose cables shall be installed as wiring within buildings.

Exception No. 1: Unlisted outside plant communications cables shall be permitted where the length of unlisted cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure or on a listed primary protector.

FPN No. 1: Splice cases or terminal boxes, both metallic and plastic types, are typically used as enclosures for splicing or terminating telephone cables.

FPN No. 2: This exception limits the length of unlisted outside plant cable to 15 m (50 ft), while 800.30(B) requires that the primary protector be located as close as practicable to the point at which the cable enters the building. Therefore, in installations requiring a primary protector, the outside plant cable may not be permitted to extend 15 m (50 ft) into the building if it is practicable to place the primary protector closer than 15 m (50 ft) to the entrance point.

Substantiation:

Currently, Listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3 and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. This proposal revises Section 800.50 such that it covers installation requirements only since the listing requirements are covered elsewhere. Furthermore, the existing Exception No. 2 is deleted because it became redundant when the definition of point of entrance was added to the definitions section in the 1999 NEC.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-102 Log #865 NEC-P16 (800-50) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 800.50, Exception No. 3 as follows:

Exception No. 3: Unlisted outside plant communications cables shall be permitted within buildings in spaces other than ceiling cavity plenums and raised-floor plenums. ~~Listing and marking shall not be required where the~~ The length of the unlisted cable permitted within the building, measured from its point of entrance, ~~does~~ shall not exceed 15 m (50 ft). ~~and the~~ The unlisted cable shall enter~~s~~ the building from the outside and ~~is~~ shall be terminated in an enclosure or on a listed primary protector

Substantiation:

The NEC presently permits up to 50 ft of unlisted outside plant cable to be run into a building, but places no restriction on installing the unlisted cables in air handling spaces where they could contribute to fire and smoke hazard. This proposal adds that restriction, further contributing to fire and smoke safety. A similar proposal is being submitted by the *NFPA Technical Committee on Air-Conditioning* to correlate with requirements for cables in plenums contained in NFPA 90A, that has primary jurisdiction for combustible materials used in air ducts and plenum spaces. This is a companion proposal and is intended to correlate with similar proposals for 770.50 and 820.50.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-107.

Panel Statement:

The current Code allows 50 feet of unlisted (outside plant) entrance cable in the building without restriction. This proposal would correct part of the problem by prohibiting entrance cable from being installed in ceiling cavity plenums and raised floor plenums. The solutions offered by Proposals 16-31, 16-107 and 16-170 are more comprehensive and include the submitter's intended wording; they prohibit unlisted (outside plant) entrance cable from being installed in risers, air ducts and all plenums. Accordingly, the panel has accepted Proposals 16-31, 16-107 and 16-170 and accepts this proposal in principle.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums and raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code without any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-105 Log #2573 NEC-P16 **Final Action: Accept in Principle**
(Table 800-50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Table 800.50 as shown.

INSERT Table 800.50 HERE

(Table shown on page 2759)

Substantiation:

This proposal is a companion proposal to the limited fire hazard cable proposals for change to Sections 800.51 and 800.52 in order to correlate with the cable listing requirements in NFPA 90A-2002.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-112.

Panel Statement:

See panel statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-103 Log #3275 NEC-P16 **Final Action: Reject**
(800-50)

Submitter: Leonard F. Devine, Jr. W. Palm Beach, FL

Recommendation:

Revise to read as follows:

800.50 Listing, Marking, and Installation of Communications Wires and Cables. Communications wires and cables installed as wiring within or under buildings shall be listed as being suitable for the purpose and installed in accordance with 800.52, and 300.5(D)(5). Communications cables and under carpet communications wires shall be so marked in accordance with Table 800.50. The cable voltage rating shall not be marked on the cable or the under carpet communications wire.

Substantiation:

Essential life safety systems such as fire alarm, nurse call, control wiring may be jeopardized with a dry location wire installed in what is considered a wet location.

Panel Meeting Action: Reject

Panel Statement:

There currently exists commercially available communications wire and cable intended for installation outside buildings, aerial, underground, or direct buried. There is no reason to create another listing category. Wire or cable intended for indoor application should not be used outside or beneath buildings.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-104 Log #1657 NEC-P16 **Final Action: Accept in Part**
(Table 800-50, 800.51(G), 800.52(D), 800.53(D) and Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Delete all references to multipurpose cable in the Code. Specifically delete:
645.5(5)(C) Cable type designations Type TC (Article 336); Types CL2, CL3, and PLTC (Article 725); Type ITC (Article 727); Types NPLF and FPL (Article 760); Types OFC and OFN (Article 770); Types CM ~~and MP~~ (Article 800); and Type CATV (Article 820). These designations shall be permitted to have an additional letter P or R or G. Green, with one or more yellow stripes, insulated single conductor cables, 4 AWG and larger, marked "for use in cable trays" or "for CT use" shall be permitted for equipment grounding.
~~760.61(D) FPN: For information on multipurpose cables (Types MPP, MPR, MPG, MP) and communications cables (Types CMP, CMR, CMG, CM), see 800.51.~~
Table 760.61 Delete the column "coaxial".
Table 800.50 Delete the rows for MPP, MPR and MP cables.
800.51~~(G) Multipurpose (MP) Cables. Until July 1, 2003, cables that meet the requirements for Types CMP, CMR, CMG, and CM and also satisfy the requirements of 760.71(B) for multiconductor cables and 760.71(H) for coaxial cables shall be permitted to be listed and marked as multipurpose cable Types MPP, MPR, MPG, and MP, respectively.~~
800.52(D) Cable Trays. Types ~~MPP, MPR, MPG, and MP multipurpose cables and~~ Types CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays. Communications raceways, as described in 800.51, shall be permitted to be installed in cable trays.
800.53(D) Cable Trays. Types ~~MPP, MPR, MPG, and MP multipurpose cables and~~ Types CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays.
Table 800.53 Delete MPP, MPR and MP.

Substantiation:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned Code-Making Panel 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC."
There are no requirements or specifications for the use of multipurpose cable versus the communications cables already specified. Consequently, the code panels are obliged to follow the Technical Correlating Committee directive and accept this proposal.

Panel Meeting Action: Accept in Part

The panel accepts the portions of the proposal that deal with the articles under its jurisdiction.

Panel Statement:

See panel action in proposal 16-28. The panel accepts this proposal for the additional reason that the requirement for listing of multipurpose cables expires on July 1, 2003.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Affirmative:

KAHN: See my Comment on Affirmative on Proposal 16-28 (Log #1660).

16-106 Log #367 NEC-P16 **Final Action: Accept in Principle**
(800-50 Exception No. 3)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise Section 800.50 Exception No. 3 as follows:

Exception No. 3: Unlisted outside plant communications cables shall be permitted within buildings in spaces other than ceiling cavity plenums and raised floor plenums, ~~Listing and marking shall not be required~~ where the length of the unlisted cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure or on a listed primary protector.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and the development of smoke under standard fire exposures. The purpose of the limitation is to produce the risk of fire spread within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definitions in Article 100. This proposal prohibits the use on unlisted (non-fire-retardant) outside plant cable in plenums in order to correlate with NFPA 90A.

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

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-107.

Panel Statement:

The current Code allows 50 feet of unlisted (outside plant) entrance cable in the building without restriction. This proposal would correct part of the problem by prohibiting entrance cable from being installed in ceiling cavity plenums and raised floor plenums. The solutions offered by Proposals 16-31, 16-107 and 16-170 are more comprehensive and include the submitter's intended wording; they prohibit unlisted (outside plant) entrance cable from being installed in risers, air ducts and all plenums. Accordingly, the panel has accepted Proposals 16-31, 16-107 and 16-170 and accepts this proposal in principle.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums and raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-107 Log #1076 NEC-P16 **Final Action: Accept**
(800-50 Exception No. 3)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise Section 800.50 Exception No. 3 as follows:

Exception No. 3: Unlisted outside plant communications cables shall be permitted within buildings in spaces other than risers, air ducts, ceiling cavity plenums, raised floor plenums, duct distribution plenums, apparatus casing plenums, and air-handling unit room plenums where the length of unlisted communication cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the unlisted communications cable enters the building from the outside and is terminated in an enclosure or on a listed primary protector.

Substantiation:

Unlisted outside plant entrance cables are sometimes run in risers, ducts and plenums. When the 50-foot exemption for outside plant cable was adopted, it was assumed that the entrance cable would go into an equipment room. It was not envisioned that the unlisted cable, which is not fire resistant, would run up a riser, in an air duct or plenum.

Panel Meeting Action: Accept

Panel Statement:

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "spaces other than risers, air ducts, ceiling cavity plenums, raised floor plenums duct distribution plenums, apparatus casing plenums and air-handling unit room plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-112 Log #1665 NEC-P16 (800-51) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

[Text of Proposal 16-112 recommendation is shown on page 2487]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types CL2D and CL3D, duct have significantly lower fuel load and lower smoke production than conventional Types CL2P and CL3P plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors offices, clean rooms, laboratories, strip malls etc

Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution table and figure have been simplified in order to make them easier to understand. Multipurpose cables have been deleted because the listing requirement no longer exists. Likewise the cable marking table has been simplified. The requirement for the removal of abandoned cables has been removed because it is redundant.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling

cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Strike CMG from text in all locations (including Figures and Tables) in the proposal. Also, strike the entire row that pertains to CMG in Table 800.50. In Figure 800.53, remove "Type MP-multipurpose cable". In 800.53(A)(2)(b), replace the word "or" with "and" in the last sentence.

Change "communications duct cable(s)" to "communications air duct cable(s)" in all locations.

In proposed section 800.53(A)(2)(b), change from "Listed plenum communications raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C)." to "Listed plenum communications raceways shall be permitted to be installed in other spaces used for environmental air as described in 300.22(C)."

Panel Statement:

General purpose cables were deleted by Proposal 16-28.

The panel added the word "air" to the term "duct cable(s)" because the term "duct cable(s)" is too general and could lead to confusion by the user. The term "air duct cable(s)" is much more descriptive. The term "air duct" is defined in NFPA 90A and in proposed revision to this Article. See Proposal 16-9.

The panel deleted the phrase "in ducts and plenums as described in 300.22(B) and" because it conflicts with the requirements of NFPA 90A.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

800.51 becomes new 800.82

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: If approved this proposal would allow cables other than listed in 300.22 (B) to be installed in air duct used for environmental air. This proposal list cables that are not contained in 300.22 (B). There is no reason to place ANY combustible cable product in an environmental air duct and this proposal would violate 300.22 (B). This proposal could lead to the use of "air duct" as a raceway for uses other than "necessary for their direct action on, or sensing of, the contained air". The majority of installed air duct control and sensing is run external to the air duct and is run in raceway. In large air handling environments where there may be a need for internal wiring/cabling the cables are MC, MI or in metallic raceway per 300.22 (B). Most, if not all, applications of energy management control fit into the two methods listed above.

This proposal would also remove the requirement "Abandoned cables shall not be permitted to remain" within the plenum and riser sections that have been referenced here and replace it with "accessible portions of abandoned cables shall not be permitted to remain (from 800.52 (B)). Most submitters to this proposal did not strike out or change the requirement for the removal of abandoned cables in plenums and risers. However this accepted proposal makes this change. There is no technical substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be aloud to remain. "Inaccessible" could have a broad scope of meaning to installers or the AHJ.

Every effort to remove abandoned cables should be made. Therefore the requirements of 300.22 (B) should be complied with. Most cables installed per 300.22 (B) can be removed.

Further the NEC already adequately covers wiring in spaces that provide environmental air -- whether these spaces are air ducts, air conditioning rooms, ceiling cavities, or raised floor cavities -- in 300.22(B) and 300.22(C). Other codes should not be deciding on the types of wiring methods to be used in these spaces. The electrical experts are capable of doing this, and it is covered quite well in 300.22. The more we let those outside of the NEC make these decisions the more we weaken adoption of the NEC. Also, we could make the change and there is nothing that requires a jurisdiction to even adopt 90A.

In addition, we do not find that the 90A Committee has even determined itself what minimum requirements are needed for testing electrical wiring. According to one of the speakers, 90A agreed to the proposals for coordination, but did not originate the proposals that introduce the new "air duct" cable. This appears to be an effort designed to purport on one hand that this is what 90A wants; then when they take it to 90A this summer it will be presented as a :done deal" at the NEC. There is far from consensus among the NEC committees and Panel 16 appears to be the strongest proponents.

The real action that needs to be taken is to rename "plenum cable", because technically the Code does not permit it in 300-22(B) applications and it is being misapplied by designers."

Comment on Affirmative:

DORNA: See my comment on proposal 16-37. The panel action to permit communications raceway to be used in "other spaces used for environmental air" needs to be changed to "ceiling cavity plenums and raised floor plenums" as was done for CATV raceway in Proposal 16-194.

16-115 Log #1756 NEC-P16 (800-51) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

800.51 Listing Requirements for Communications Wires and Cables and Communications Raceways.

Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.51(A) through (J), and communications raceways shall be listed in accordance with 800.51(K) through (L). Conductors in communications cables, other than in a coaxial cable, shall be copper.

FPN: See 800.4 for listing requirement for equipment.

(A) Type CMP. Type CMP communications plenum cable shall be listed as being suitable for use in ~~ducts, plenums and other space used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, as described in 300.22 (C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(B) Type CMR. Type CMR communications riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(C) Type CMG. Type CMG general-purpose communications cable shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M 1985, Test Methods for Electrical Wires and Cables.

(D) Type CM. Type CM communications cable shall be listed as being suitable for general-purpose communications use, with the exception of risers and plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-115 substantiation is shown on page 2492]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal would list cables for unrestricted use in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-125 Log #2574 NEC-P16 (800-51) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Section 800.51 as shown below.

800.51 Listing Requirements for Communications Wires and Cables and Communications Raceways. Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.51(A) through (J), and communications raceways shall be listed in accordance with 800.51(K) through (ML). Conductors in communications cables, other than in a coaxial cable, shall be copper.

FPN: See 800.4 for listing requirement for equipment.

(A) Type CMD duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for materials installed in ducts and plenums.

(BA) Type CMP. Type CMP communications plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other spaces used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; "I" to "J"; "J" to "K"; "K" to "L"; and "L" to "M".

Substantiation:

[Text of Proposal 16-125 substantiation is shown on page 2519]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

ODE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-126 Log #2577 NEC-P16 (800-51) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise text to read as follows:

820.51 Additional Listing Requirements. Cables shall be listed in accordance with 820.51(A) through (E~~D~~).

(A) Type CATVD. Type CATVD community antenna television duct cable shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for materials installed in ducts and plenums.

(B~~A~~) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ceiling cavity and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating System* for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; and "D" to "E".

Substantiation:

[Text of Proposal 16-126 substantiation is shown on page 2520]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-116 Log #1851 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.43, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise Section 800.51 as shown below:

Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.51(A) through (J), and communications raceways shall be listed in accordance with 800.51(K) through (M ~~L~~) Conductors in communications cables, other than in a coaxial cable, shall be copper.

FPN: See 800.4 for listing requirement for equipment.

(A) Type CMD. Type CMD duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(B~~A~~) Type CMP. Type CMP communications plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other spaces used for environmental air~~ ceiling cavity plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining existing subparagraphs as follows:

"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; "I" to "J"; "J" to "K"; "K" to "L"; and "L" to "M".

Revise Table 800.50 as shown.

Insert Table 800.50 Here

(Table shown on page 2760)

Revise Sections 800.53(A), (B), (C), (D), (G), Table 800.53, and Figure 800.53 as shown. The other sections do not change.

800.53 Applications of Listed Communications Wires and Cables and Communications Raceways.

Communications wires and cables shall comply with the requirements of 800.53(A) through (F) or where cable substitutions are made in accordance with 800.53(G).

(A) Air Ducts and Plenums.

Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CMD and shall be associated with the air duct system. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CMD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CMD cable shall be mechanically protected to a height of 7 ft above the floor. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(b~~A~~) ~~Plenum.~~ Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type CMD or CMP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CMD. The accessible portion of ~~Abandoned~~ abandoned cables shall not be permitted to remain. Types CMD, CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Types CMD and CMP cable shall be permitted to be installed in these raceways.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(B) Riser. Cables installed in risers shall comply with 800.53(B)(1), (B)(2), or (B)(3).

(1) Cables in Vertical Runs. Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type CMR. Floor penetrations requiring Type CMR shall contain only cables suitable for riser or permitted substitutes in Table 800.53 ~~plenum use~~. Abandoned cables shall not be permitted to remain. Listed riser communications raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Type CMR, CMD, and CMP cables shall be permitted to be installed in these raceways.

(2) Metal Raceways or Fireproof Shafts. Listed communications cables shall be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) One- and Two-Family Dwellings. Type CM and CMX cable shall be permitted in one- and two-family dwellings.

FPN: See 800.52(B) for firestop requirements for floor penetrations.

(C) Distributing Frames and Cross-Connect Arrays. Listed communications wire and Types CMD, CMP, CMR, CMG, and CM

communications cables shall be used in distributing frames and cross-connect arrays.
(D) Cable Trays. Types MPP, MPR, MPG, and MP multipurpose cables and Types CMD, CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays.
(E) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 800.53(A) through (D) shall be in accordance with 800.53(E)(!) through (E)(6).
(1) General. Cables shall be Type CMG or Type CM. Listed communications general-purpose raceways shall be permitted. Only Types CMD, CMG, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.
(2) In Raceways. Listed communications wires that are enclosed in a raceway of a type included in Chapter 3 shall be permitted.
(3) Nonconcealed Spaces. Type CMX communications cable shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).
(4) One- and Two-Family Dwellings. Type CMX communications cable less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in one- and two-family dwellings.
(5) Multi-Family Dwellings. Type CMX communications cable less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in nonconcealed spaces in multi-family dwellings.
(6) Under Carpets. Type CMUC undercarpet communications wires and cables shall be permitted to be installed under carpet.
(F) Hybrid Power and Communications Cable. Hybrid power and communications cable listed in accordance with 800.51(J) shall be permitted to be installed in one- and two-family dwellings.
(G) Cable Substitutions. The uses and permitted substitutions for communications cables listed in Table 800.53 shall be considered suitable for the purpose and shall be permitted.
FPN: For information on Types CMD, CMP, CMR, CMG, CM, and CMX cables, see 800.51.

Insert Table 800.53 Here

(Table shown on page 2760)

Revise Figure 800.53 Cable Substitution Hierarchy, as shown below.

Insert artwork (Fig. 800.53) Here

Substantiation:

I am a member of the 90A Committee who worked on the 2002 90A Standard and voted in favor of the listing requirement for "limited combustible cable"*, which is now included in the document. However, the 2002 edition of the 90A Standard does not address the installation of wire and cable in ducts and plenums, other than ceiling cavity plenums and raised floor plenums.
Since there are field applications where cables are installed inside ducts and other than ceiling cavity plenums and raised floor plenums, it seems prudent that the Class of cables described herein should be required since they meet all the requirements for supplementary materials plus they meet all the requirements for use in ceiling cavity and raised floor plenums.
Since these cables are inaccessible, it is not feasible to remove them. Therefore, a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Based on extensive work by the FPRF, the Types of cables described herein have significantly lower fuel load and lower smoke production than conventional plenum cables Types.
An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording contained in proposals submitted by the 90A Committee. The cable substitution table and figure have been revised in order to make them easier to understand.
*Note: The term limited combustible was not used in the proposed text. The Standards Council, in a recently, directed that this term not be used for cables.
"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."
This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed for duct cable.

Panel Meeting Action: Accept in Principle
Panel Statement:
See panel action and statement in Proposal 16-112.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 3
Explanation of Negative:
JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.
JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables

are not suitable for use in the environmental air handling spaces where their use is presently accepted.
OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-127 Log #3024 NEC-P16 **Final Action: Accept in Principle**

(800-51, 800.53, Figure 800.53, Table 800.50, Table 800.53
)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Bob Allen, Mohawk/DCT

Recommendation:

Revise Section 800.51 as shown below:

[Text of Proposal 16-127 recommendation is shown on page 2523]

Substantiation:

[Text of Proposal 16-127 substantiation is shown on page 2524]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.
OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-109 Log #1145 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Revise Section 800.51 as shown below:

800.51 Listing Requirements for Communications Wires and Cables and Communications Raceways. Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.51(A) through (J), and communications raceways shall be listed in accordance with 800.51(K) through (M~~L~~). Conductors in communications cables, other than in a coaxial cable, shall be copper.

FPN: See 800.4 for listing requirement for equipment.

(A) Type CMD. Type CMD duct cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(B~~A~~) Type CMP. Type CMP communications plenum cable shall be listed as being suitable for use in ~~ducts, plenums, and other spaces used for environmental air~~ ceiling cavity and plenums and raised floor plenums and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "H"; "H" to "I"; "J" to "K"; "K" to "L"; and "L" to "M".

Revise Table 800.50 as shown:

INSERT TABLE 800.50 HERE

(Table shown on page 2759)

Revise Sections 800.53(A), (B), (C), (D), (G), Table 800.53 and Figure 800.53 as shown. The other sections do not change.

800.53 applications of Listed Communications Wires and Cables and Communications Raceways. Communications wires and cables shall comply with the requirements of 800.53(A) through (F) or where cable substitutions are made in accordance with 800.53(G).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CMD and shall be associated with the air duct system. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CMD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CMD cable shall be mechanically protected to a height of 7 feet above the floor. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

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

FPN: Plenums described in NFPA 90A-2002, Standard for the Installationof Air-Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(B) Riser. Cables installed in risers shall comply with 800.53(B)(1), (B)(2), or (B)(3).

(1) Cables in Vertical Runs. Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type CMR. Floor penetrations requiring Type CMR shall contain only cables sutiable for riser or permitted substitutes in Table 800.53 ~~plenum use~~. Abandoned cables shall not be permitted to remain. Listed riser communications raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Type CMR, CMD, and CMP cables shall be permitted to be installed in these raceways.

(2) Metal Raceways or Fireproof Shafts. Listed communications cables shall be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) One- and Two-Family Dwellings. Type CM and CMX cable shall be permitted in one- and two-family dwellings.

FPN: See 800.52(B) for fire stop requirements for floor penetrations.

(C) Distributing Frames and Cross-Connect Arrays. Listed communications wire and Types CMD, CMP. CMR, CMG, and CM communications cables shall be used in distributing frames and cross-connect arrays.

(D) Cable Trays. Types MPP, MPR, MPG and MP multipurpose cables and Type CMD, CMP, CMR, CMG and CM communications cables shall be permitted to be installed in cable trays.

(E) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 800.53(A) through (D) shall be in accordance with 800.53(E)(1) through (E)(6).

(1) General. Cables shall be Type CMG or Type CM. Listed communications general-purpose raceways shall be permitted. Only Types CMD, CMG, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.

(2) In Raceways. Listed communications wires that are enclosed in a raceway of a type included in Chapter 3 shall be permitted.

(3) Nonconcealed Spaces. Type CMX communications cable shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).

(4) One- and Two-Family Dwellings. Type CMX communications cable less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in one- and two-family dwellings.

(5) Multi-Family Dwellings. Type CMX communications cables less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in nonconcealed spaces in multi-family dwellings.

(6) Under Carpets. Type CMUC undercarpet communications wires and cables shall be permitted to be installed under carpet.

(F) Hybrid Power and Communications Cable. Hybrid power and communications cable listed in accordance with 800.51(J) shall be permitted to be installed in one- and two-family dwellings.

(G) Cable Substitutions. The uses and permitted substitutions for communications cables listed in Table 800.53 shall be considered suitable for the purpose and shall be permitted.

FPN: For information on Types CMD, CMP, CMR, CMG, CM and CMX cables, see 800.51.

INSERT TABLE 800.53 HERE

(Table shown on page 2760)

Revise Figure 800.53 Cable Substitution Hierarchy, as shown below:

INSERT FIGURE 800.53 HERE

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP, etc) cable to be installed in "ducts, plenums, and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the air-conditioning committee to restrict plenum cable (CL2P, CL3P, CMP, etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums". The answers is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum able (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish 'limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for use in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the

limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-112.

Panel Statement:

See panel statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-113 Log #1694 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Patricia Jenks, Krone Digital Communications

Recommendation:

[Text of Proposal 16-113 recommendation is shown on page 2489]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770,
820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.
NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.
Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for

the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air- Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

800.51 becomes new 800.82

800.53 becomes new 800.61

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation. Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-114 Log #1705 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Robert Dennelly, Avaya

Recommendation:

[Text of Proposal 16-114 recommendation is shown on page 2491]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, the article I have provided: "Burning Issue - New Plenum Cable Enhances Fire Safety" from the February 2001 issue of "Cabling Business Magazine," by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums.

Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Note: Supporting Material available for review at NFPA headquarters.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-118 Log #2370 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 16-118 recommendation is shown on page 2503]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, "Burning Issue- New Plenum Cable Enhances Fire Safety" from the February 2001 issue of Cabling Business Magazine, by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire,

cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-119 Log #2372 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 16-119 recommendation is shown on page 2505]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the

Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-122 Log #2380 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 16-122 recommendation is shown on page 2509]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?
In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

Relevant sections of 2002 edition of NFPA 90A are attached.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-123 Log #2382 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 16-123 recommendation is shown on page 2511]

Substantiation:

[Text of Substantiation 16-123 substantiation is shown on page 2512]

Panel Meeting Action: Accept in Principle

Strike CMG from text in all locations (including Figures and Tables) in the proposal. Also, strike the entire row that pertains to CMG in Table 800.50. In Figure 800.53, remove "Type MP-multipurpose cable". In 800.53(A)(2)(b), replace the word "or" with "and" in the last sentence.

Change "communications duct cable(s)" to "communications air duct cable(s)" in all locations.

In proposed section 800.53(A)(2)(b), change from "Listed plenum communications raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C)." to "Listed plenum communications raceways shall be permitted to be installed in other spaces used for environmental air as described in 300.22(C)."

Panel Statement:

General purpose cables were deleted by Proposal 16-28.

The panel added the word "air" to the term "duct cable(s)" because the term "duct cable(s)" is too general and could lead to confusion by the user. The term "air duct cable(s)" is much more descriptive. The term "air duct" is defined in NFPA 90A and in proposed revision to this Article. See Proposal 16-9.

The panel deleted the phrase "in ducts and plenums as described in 300.22(B) and" because it conflicts with the requirements of NFPA 90A.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

800.51 becomes new 800.82.

800.53 becomes new 800.61.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-124 Log #2442 NEC-P16 **Final Action: Accept in Principle**
(800-51, 800.53, Figure 800.53, Table 800.53 & Table 800.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

[Text of Proposal 16-124 recommendation is shown on page 2513]

Substantiation:

[Text of Proposal 16-124 substantiation is shown on page 2515]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-110 Log #1221 NEC-P16 **Final Action: Reject**
(800-51, Table 800.50, 800.53(A), Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Richard Fransen, Daiken America, Inc.

Recommendation:

[Text of Proposal 16-110 recommendation is shown on page 2487]

Substantiation:

The Technical Committee on Air Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, the Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA 90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed combustible plenum cable that is the equivalent of FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Panel Meeting Action: Reject

Panel Statement:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned Code-Making Panel 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC." This proposal does not contain a requirement for the use of duct cable.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

16-121 Log #2378 NEC-P16 **Final Action: Accept in Principle**
(800-51, Table 800.50, 800.53(A), Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 16-121 recommendation is shown on page 2508]

Substantiation:

The Technical Committee on Air Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, the Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed combustible plenum cable that is the equivalent of FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

No figure received.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-108 Log #1067 NEC-P16 **Final Action: Accept in Principle**
(800-51, Table 800.50, 800.53, Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Hong Chen, OFS

Recommendation:

Revise 800.51 as shown below:

800.51 Listing Requirements for Communications Wires and Cables and Communication Raceways.

Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.51(A) through (J), and communications raceways shall be listed in accordance with 800.51(K) through (~~L~~M). Conductors in communications cables, other than in a coaxial cable, shall be copper.

FPN: See 800.4 for listing requirement for equipment.

(A) Type CMD. Type CMD communications duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~A~~B) Types CMP communications plenum cable shall be listed as being suitable for use in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other space used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:

"B" to "C", "D" to "E", "E" to "F", "F" to "G", "G" to "H", "I" to "J", "J" to "K", "K" to "L", "L" to "M".

Revise Table 800.50 as shown below:

Insert Table 800.50 Here

(Table shown on page 2759)

Revise Section 800.53, Table 800.53, and Figure 800.53 as shown below.

800.53 Applications of Listed Communications Wires and Cables and Communications Raceways. Communications wires and cables shall comply with the requirements of 800.53(A) through (F) or where cable substitutions are made in accordance with 800.53(G).

(A) Air Ducts. Cables installed in air ducts shall be Type CMD. Abandoned cables shall not be permitted to remain. Types CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted.

(~~A~~B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts,~~ ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type CMD or Type CMP. Abandoned cables shall not be permitted to remain. Types CMD, CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ~~ducts~~ ceiling cavity plenums and raised floor ~~and~~ plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Types CMD and CMP cable shall be permitted to be installed in these raceways.

Renumber the remaining subparagraphs as follows:

"B" to "C"; "C" to "D"; "D" to "E"; "E" to "F"; "F" to "G"; "G" to "I".

Insert Table 800.53 Here

(Table shown on page 2759)

Revise Figure 800.53 as shown below:

Insert Artwork (Figure 800.53) Here

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 770, 820, and 830, permit plenum (OFNP, FPLP, CMP, etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP, etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not

plenum cable (OFNP, FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and, 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in a duct. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditiioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-112.

Panel Statement:

See panel statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37

DORNA: See my comment on Proposal 16-57.

16-111 Log #1441 NEC-P16 **Final Action: Accept in Principle**
(800-51, Table 800.50, 800.53, Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Dan Kennefick, Ber-Tek a Nexans Company

Recommendation:

Revise 800.51 as shown below:

800.51 Listing Requirements for Communications Wires and Cables and Communications Raceways. Communications wires and cables shall have a voltage rating of not less than 300 volts and shall be listed in accordance with 800.51(A) through (J), and communications raceways shall be listed in accordance with 800.51(K) through (~~L~~ M). Conductors in communications cables, other than in a coaxial cable, shall be copper.

FPN: See 800.4 for listing requirement for equipment.

(A) Type CMD. Type CMD communications duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System, for materials installed in ducts and plenums.

(~~A~~ B) Type CMP. Type CMP communications plenum cable shall be listed as being suitable for use in ~~ducts,~~ ceiling cavity plenums and raised floor plenums~~, and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested n accordance with NFPA 262, 1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining subparagraphs as follows:
"B" to "C", "D" to "E", "E" to "F", "F" to "G", "G" to "H", "I" to "J", "J" to "K", "K" to "L", "L" to "M"

Revise Table 800.50 as shown below:

INSERT TABLE 800.50 HERE

(Table shown on page 2760)

Revise Section 800.53, Table 800.53, and Figure 800.53 as shown below.

800.53 Applications of Listed Communications Wires and Cables and Communications Raceways. Communications wires and cables shall comply with the requirements of 800.53(A) through (F) or where cable substitutions are made in accordance with 800.53(G).

(A) Air Ducts. Cables installed in air ducts shall be Type CMD. Abandoned cables shall not be permitted to remain. Types CMR, CMR, CMG, CM, and CMX communications wire installed in compliance with 300.22 shall be permitted.

(~~A~~ B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts,~~ ceiling cavity plenums and raised floor plenums~~, and other spaces used for environmental air~~ shall be Type CMD or Type CMP. Abandoned cables shall not be permitted to remain. Types CMD, CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Lised plenum communications raceways shall be permitted to be installed in ~~ducts~~ ceiling cavity plenums and raised floor ~~and~~ plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Types CMD and CMP cable shall be permitted to be installed in these raceways.

Renumber the remaining subparagraphs as follows:
"B" to "C", "C" to "D", "D" to "E", "E" to "F", "F" to "G", "G" to "I"

Revise Table 760.61 as shown below:

INSERT TABLE 800.53 HERE

(Table shown on page 2760)

Revise Figure 800.53 as shown below:

INSERT FIGURE 800.53 HERE
Figure 800.53 Cable Substitution Hierarchy

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, had made a series of proposals to correlate NFPA 70, National Electrical Code, with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 770, 820, and 830, permit plenum (OFNP, FPLP, CMP, etc.), cable to be installed in "ducts, plenums and other space used for environment air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP, etc.), to ceiling cavity and raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A? In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

(1) Listed noncombustible cable

(2) Listed limited combustible cable that has a maximum smoke developed index of 50

(3) Listed combustible plenum cable that is the equivalent of FPLP, CMP, etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not be qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.), because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. Also see my presentation from the BICSI 2002 Spring Conference.

Two paragraphs from the substantiation to the proposal from the Air-Conditioning Committee are shown below:

""The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

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

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC□ description "other spaces used for environmental

cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-117 Log #2361 NEC-P16 **Final Action: Accept in Principle**
(800-51, Table 800.50, 800.53, Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: J. R. Craig, ComNet

Recommendation:

Revise 800.51 as shown:

[Text of Proposal 16-117 recommendation is shown on page 2501]

Substantiation:

[Text of Proposal 16-117 substantiation is shown on page 2502]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-120 Log #2374 NEC-P16 **Final Action: Accept in Principle**
(800-51, Table 800.50, 800.53, Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James R. Hoover, DuPont, Electronic & Communication Technologies

Recommendation:

[Text of Proposal 16-120 recommendation is shown on page 2507]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 770, 770, 820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CL2P, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of ducts." The answer is "Yes, it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?
In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in a duct. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP etc.) from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is

passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-128 Log #1392 NEC-P16 **Final Action: Accept**
(800-51(A), 820.51 (A) and FPN NO.2 in 830.5 (A) (2))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise current FPN, which reads, in Articles 725, 760, 770, 800, and 820, (Article 830 is similar.):

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

To (proposed new text):

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air-Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other thanceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable, and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal would editorially revise the listing requirements for plenum cable by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

800.51 becomes new 800.82.

820.51 becomes new 820.82.

830.5 becomes new 830.82.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

JENSEN: While I agree with the Panel’s intent of providing a FPN to define "adequate fire-resistant and low smoke-producing characteristics" there is no such definition found in NFPA 90A, Standard for the installation of Air-Conditioning and Ventilating Systems. The wording used in the Panel action is a requirement of NFPA 90A, not a definition.

16-129 Log #1733 NEC-P16 **Final Action: Accept in Principle**
(800-51(A), FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle

Panel Statement:

The submitter's intent was satisfied by Proposal 16-128. The panel recognizes that the Technical Committee on Air-Conditioning has primary responsibility for combustibles in plenum spaces. Without compelling reason, the panel generally would accept a proposal from the air-conditioning committee rather than another source. The Panel accepts the recommended Fine Print Note wording from the Air Conditioning Committee (Proposal 16-128) and accepts this similar proposal "in principle" because the panel has no compelling reason to alter wording proposed by the air conditioning committee and the submitter has not provided sufficient substantiation to deviate from the wording proposed by the air conditioning committee.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment. If the Air Conditioning Committee prefers the wording in this proposal, it can indicate its preference in a comment for consideration at the ROC meeting in December.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-130 Log #3234 NEC-P16 (800-51(H)) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal.
Examples located in the Panel Action text do not comply with the NEC Style Manual and should be placed in FPNs.
This action will be considered by the Panel as a Public Comment.

Submitter: Edward Walton, Draka USA

Recommendation:

Insert new paragraph 800.51(H) in proper place and renumber remaining paragraphs.
New paragraph 800.51(H) to read as follows:
(H) Communications Circuit Integrity (CI) Cable. Two hour fire rated communications cable suitable for use as communication circuits critical for life safety, property protection, and emergency management and designed to ensure circuit integrity and survivability of such communications circuits for a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 800.51(A), (B), (C), (D), and (E) that also meets the requirements for circuit integrity shall have this additional classification using the suffix "CI" (for example, CMP-CI, CMR-CI, CMG-CI, CM-CI, and CMX-CI).
FPN: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistive Cables.

Substantiation:

A heightened interest in the ability to maintain communications throughout the entire time of an emergency has prompted numerous agencies to require that steps be taken to assure the circuit integrity and survivability of certain critical communications circuits during a fire in a building. It is vitally important that NFPA 70, National Electrical Code, offer a code-complying method for meeting these requirements.
Designers and installers of electrical systems, including communications systems, continually seek performance guidance from the NEC in order to assure the safety of electrical installations. It behooves the NEC to make certain that it makes suitable provisions to recognize specialized electrical components and installation methods that will allow building owners to meet requirements of other documents that seek to assure life safety, property protection, and emergency management.

Panel Meeting Action: Accept in Principle

Insert new paragraph 800.51(H) in proper place and renumber remaining paragraphs.
New paragraph 800.51(H) to read as follows:
"(H) Communications Circuit Integrity (CI) Cable. Cables suitable for use in communications systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity (CI) cable. Cables identified in 800.51 (A), (B), (C), (D), and (E) that meet the requirements for circuit integrity shall have the additional classification using the suffix "CI" (for example, CMP-CI, CMR-CI, CM-CI, and CMX-CI).
FPN: One method of defining circuit integrity (CI) cable is by establishing a minimum 2-hour fire resistance rating for the cable when tested in accordance with UL 2196-1995, Standard for Tests of Fire Resistive Cables."

Panel Statement:

The wording was altered to be consistent with a similiar provision in Article 760.31. The Type CMG-CI was removed in accordance with panel action in Proposals 16-28 and 16-104.
800.51 becomes new 800.82

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-131 Log #68b NEC-P16 (800-52) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber sections 770.52; 800.52; 820.52 and 830.58 to be 770.55; 800.55; 820.55 and 830.55, respectively.
Renumber the reference to 800.52(D) in 725.61(C) to 800.55(D).
In the first sentence of 800.52 (new 800.55), change "800.52(A)" to "800.55(A)".
In the first sentence of 830.58 (new 830.55), change "830.58(A)" to "830.55(A)".
In 830.58(C) (new 830.55(C)), change "Table 830.58" to "Table 830.55" three times.

Substantiation:

This change lines up Section 725.55 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium Power Network-Powered Broadband Communications Cables, Section 760.55 Separation from Electric Light, Power, Class 1, NPLFA, and Medium Power Network-Powered Broadband Communications Circuit Conductors, Section 770.52 Installation of Optical Fibers and Electrical Conductors, Section 800.52 Installation of Communications Wires, cables, and Equipment, Section 820.52 Installation of Cables and Equipment and Section 830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods. These sections apply to similar requirements. With this change, all these sections will have the section number xxx.55.

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-132 Log #1757 NEC-P16 (800-52) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

800.52 Installation of Communications Wires, Cables, and Equipment. Communications wires and cables from the protector to the equipment or, where no protector is required, communications wires and cables attached to the outside or inside of the building shall comply with 800.52(A) through (E).

(A) and (B) to stay unchanged

(C) Equipment in ~~Other Space Used for Environmental Air~~ Plenums, Including Ceiling Cavity Plenums and Raised Floor Plenums . Section 300.22(C) shall apply.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-132 substantiation is shown on page 2525]

Panel Meeting Action: Reject

Panel Statement:

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of equipment in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of the use of equipment would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-133 Log #1290 NEC-P16 **Final Action: Accept**
(800-52(A)(1)(c) Exception No. 1)

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(c) Electric Light, Power, Class 1, Non–Power-Limited Fire Alarm, and Medium Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes. Communications conductors shall not be placed in any raceway, compartment, outlet box, junction box, or similar fitting with conductors of electric light, power, Class 1, non–power-limited fire alarm or medium power network-powered broadband communications circuits.
Exception No. 1: Where all of the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium power network-powered broadband communications circuits are separated from all of the conductors of communications circuits by a permanent barrier or listed divider.
Exception No. 2: Power conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to communications equipment. The power circuit conductors shall be routed within the enclosure to maintain a minimum of 6 mm (0.25 in.) separation from the communications circuit conductors.

Substantiation:

This proposal defines that the barrier is a permanent function of the enclosure or that a removable or field installed divider that has been listed may be used to divide the communication circuits from the power circuits.

Panel Meeting Action: Accept

Panel Statement:

800.52 (*) becomes new 800.55.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-134 Log #2902 NEC-P16 **Final Action: Reject**
(800-52(A)(3))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add 800.52(A)(3) to read as follows:
800.52(A)(3) Type ITC Cable. Jacketed communications cables shall be permitted in the same raceway, enclosure, or calbe tray with Type ITC Cable in accordance with Article 727.

Substantiation:

The current requirements of 820.52(A)(1) and 820.52(A)(2) are very confusing as well as overly restrictive. Type ITC cable has been permitted as an alternate wiring method for three Code cycles and industrial users have gained experience with ITC. This proposal gives industrial establishments flexibility to take fuller advantage of alternate wiring methods and allow additional intermixing of cables of similar energy levels without compromising practical safeguarding. This proposal also introduces cable tray as a recognized wiring method to this section. Companion proposals have been made for 800.52 and 830.58.

Panel Meeting Action: Reject

Panel Statement:

Mixing a power limited circuit cable with a non-power limited circuit cable is not permitted. ITC is not a power limited cable.
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

HUGHES: The panel action makes the assumption Type ITC cable will always contain non-power limiting circuits. Article 7272 does not prohibit power limited circuits to be contained in Type ITC cable, therefore, the panel statement to reject only addresses certain applications but not all applications of Type ITC.

16-135 Log #2628 NEC-P16 **Final Action: Reject**
(800-52(F) (New))

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Add new text to read as follows:
800.52(F) Dwelling Unit Communications Outlets. In every kitchen, family room, dining room, living room, parlor, library, den, office, sunroom, bedroom, recreation room, or similar room or area of dwelling units, cabled communications outlets shall be installed.

Substantiation:

The addition of the section will reduce tripping hazards caused by building occupants running cords from room to room. This proposal is in line with 210.52(A).

Panel Meeting Action: Reject

Panel Statement:

This proposal will force the pre-wiring of all dwelling units. No substantiating data for the perceived tripping hazard has been provided to justify such a far-reaching revision to the NEC communications requirements. Further, if accepted, this change would require that existing installations be updated when communications wiring changes are made within the dwelling unit (see 80.9(C), last sentence).

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Affirmative:

OHDE: This proposal should be revisited. At the least there could be a FPN referring to the ANSI/TIA/EIA 570A standard. Specifically 570A 5.6.4 Outlet Locations (See Material I have provided). While not so much a safety issue this could aid in recommending a method of locating dwelling unit communications outlets.
Note: Supporting material is available for review at NFPA Headquarters.

16-136 Log #2627 NEC-P16 **Final Action: Accept in Principle**
(800-52(G) (New))

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Create a new Section 800.52(G):
(G) Wiring in Ducts for Dust, Loose Stock of Vapor Removal. 300.22(A) shall apply.

Substantiation:

This proposal corrects an oversight. Section 300.22(A), shown below, should apply to communications circuits also.
(A) Ducts for Dust, Loose Stock, or Vapor Removal. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors. No wiring system of any type shall be installed in any duct, or shaft containing only such ducts, used for vapor removal or for ventilation of commercial-type cooking equipment.

Panel Meeting Action: Accept in Principle

Create a new Section 800.52(F):
(F) Wiring in Ducts for Dust, Loose Stock or Vapor Removal. 300.22(A) shall apply.

Panel Statement:

The numbering was made consistent with the existing Code and a typographical error was corrected.
800.52 (*) becomes new 800.55.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-138 Log #1758 NEC-P16 (800-53) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

800.53 Applications of Listed Communications Wires and Cables and Communications Raceways.

Communications wires and cables shall comply with the requirements of 800.53(A) through (F) or where cable substitutions are made in accordance with 800.53(G).

(A) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) . Cables shall be installed in ~~ducts, plenums, and other spaces used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type CMP. The accessible portion of abandoned communications wires and Abandoned cables shall not be permitted to remain. ~~Types CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted.~~ Listed plenum communications raceways shall be permitted to be installed in plenums, including ceiling cavity plenums and raised floor plenums, ~~ducts and plenums as described in 300.22(B) and in other spaces used for environmental air~~ as described in 300.22 (C). Only Type CMP cable shall be permitted to be installed in these raceways.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-138 substantiation is shown on page 2528]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of Types OFNP, OFCP, CMP, MPP and CATVP cables in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

The portion of the proposal that deals with cables being removed was addressed in proposal 16-141.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-137 Log #1342 NEC-P16 **Final Action: Accept in Principle**
(800-53, 820.53)

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

In Tables 800.53 and 820.53 delete the columns headed "Use" and "References".
Revise 800-53(G) as shown below:
(G) Cable Substitutions. The uses and permitted substitutions for communications cables listed in Table 800.53 ~~shall be considered suitable for the purpose and~~ shall be permitted.
FPN: For information on Types CMP, CMR, CMG, CM, and CMX cables, see 800.51.

Substantiation:

As shown below, Article 770 deals with cable substitutions simply.
(F) Cable Substitutions. The substitutions for optical fiber cables listed in Table 770.53 shall be permitted.

Table 770.53 Cable Substitutions

Cable Type	Permitted Substitutions
OFNP	None
OFCP	OFNP
OFNR	OFNP
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN

Article 830 also treats cable substitutions simply. See 830.58(E).
The parallel sections in Articles 725, 760, 800 and 820 mix cable use in with cable substitutions. This is not necessary because these Articles already deal with cable use in other sections. This proposal, if accepted, will revise Articles 725, 760, 800 and 820 to be editorially consistent with Articles 770 and 830.
Keep it simple!
Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Accept in Principle

Accept change as proposed and strike "uses and" in 800-53(G).

Panel Statement:

This is to correct omission by the submitter that changed the table without changing the text.
800.53 becomes new 800.61.
820.53 becomes new 820.61.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-140 Log #2624a NEC-P16 **Final Action: Reject**
(800-53 & 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Change "dwellings" to "dwelling" for editorial consistency with "riser" and "plenum".

Substantiation:

Editorial consistency is good.

Panel Meeting Action: Reject

Panel Statement:

This proposal deals with Figures 800.53 and 820.53. The word "Dwellings" has already been removed from the figures by Proposals 16-112 and 16-177.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665) and 16-177 (Log #1666).

16-139 Log #2575 NEC-P16 **Final Action: Accept in Principle**
(800-53, Figure 800.53, & Table 800.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Sections 800.53(A), (B), (C), (D), (G), Table 800.53, and Figure 800.53 as shown. The other Sections do not change.

800.53 Applications of Listed Communications Wires and Cables and Communications Raceways.
Communications wires and cables shall comply with the requirements of 800.53(A) through (F) or where cable substitutions are made in accordance with 800.53(G).

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CMD and shall be associated with the air duct system. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CMD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CMD cable shall be mechanically protected to a height of 7 feet above the floor. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

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

FPN: Plenums described in NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(B) Riser. Cables installed in risers shall comply with 800.53(B)(1), (B)(2), or (B)(3).

(1) Cables in Vertical Runs. Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type CMR. Floor penetrations requiring Type CMR shall contain only cables suitable for riser or permitted substitutes in Table 800.53 ~~plenum use~~. Abandoned cables shall not be permitted to remain. Listed riser communications raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Type CMR, CMD, and CMP cables shall be permitted to be installed in these raceways.

(2) Metal Raceways or Fireproof Shafts. Listed communications cables shall be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) One- and Two-Family Dwellings. Type CM and CMX cable shall be permitted in one- and two-family dwellings.

FPN: See 800.52(B) for firestop requirements for floor penetrations.

(C) Distributing Frames and Cross-Connect Arrays. Listed communications wire and Types CMD, CMP, CMR, CMG, and CM communications cables shall be used in distributing frames and cross-connect arrays.

(D) Cable Trays. Types MPP, MPR, MPG, and MP multipurpose cables and Types CMD, CMP, CMR, CMG, and CM communications cables shall be permitted to be installed in cable trays.

(E) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 800.53(A) through (D) shall be in accordance with 800.53(E)(1) through (E)(6).

(1) General. Cables shall be Type CMG or Type CM. Listed communications general-purpose raceways shall be permitted. Only Types CMD, CMG, CM, CMR, or CMP cables shall be permitted to be installed in general-purpose communications raceways.

(2) In Raceways. Listed communications wires that are enclosed in a raceway of a type included in Chapter 3 shall be permitted.

(3) Nonconcealed Spaces. Type CMX communications cable shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).

(4) One- and Two-Family Dwellings. Type CMX communications cable less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in one- and two-family dwellings.

(5) Multi-Family Dwellings. Type CMX communications cable less than 6 mm (0.25 in.) in diameter shall be permitted to be installed in nonconcealed spaces in multi-family dwellings.

(6) Under Carpets. Type CMUC undercarpet communications wires and cables shall be permitted to be installed under carpet.

(F) Hybrid Power and Communications Cable. Hybrid power and communications cable listed in accordance with 800.51(J) shall be permitted to be installed in one- and two-family dwellings.

(G) Cable Substitutions. The uses and permitted substitutions for communications cables listed in Table 800.53 shall be considered suitable for the purpose and shall be permitted.

FPN: For information on Types CMD, CMP, CMR, CMG, CM, and CMX cables, see 800.51.

Revise Table 800.53 Cable Uses and Permitted Substitutions

INSERT Table 800.53 HERE

(Table shown on page 2761)

Revise Figure 800.53 Cable Substitution Hierarchy, as shown.

INSERT Figure 800.53 HERE

Substantiation:

[Text of Proposal 16-139 substantiation is shown on page 2531]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-142 Log #877 NEC-P16 (800-53(A)) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal to correlate with the action on Proposal 16-141 that deleted this text. This action will be considered by the Panel as a Public Comment.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise the second sentence of 800.53 (A) as follows:

The accessible portion of ~~A~~abandoned cables shall not be permitted to remain.

Substantiation:

Correlates with 800.52 (B) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 800.53(B)(1), 820.53 (B) (1), 820.53 (D), 830.55 (C) (1), 725.61 (A) and 725.61 (B) (1).

Panel Meeting Action: Accept in Principle

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain."

Panel Statement:

Proposal 16-75 accomplished the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-141 (Log #191).

16-143 Log #2088 NEC-P16 (800-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise text to read as follows:

800.53(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type CMD or Type CMP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CMD. The accessible portion of abandoned cables shall not be permitted to remain. Types CMD, CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums. Only Type CMD and Type CMP cables shall be permitted to be installed in these raceways.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type CMD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type CMP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cabled and other equipment.

For further information of the fire performance of limited fir hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-144 Log #2089 NEC-P16 (800-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise text to read as follows:

800.53(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type CMD or Type CMP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CMD. The accessible portion of abandoned cables shall not be permitted to remain. Types CMD, CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums. Only Type CMD and Type CMP cables shall be permitted to be installed in these raceways.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type CMD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type CMP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cabled and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-112.

Panel Statement:

See panel statement in Proposal 16-112. The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-145 Log #2090 NEC-P16 (800-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise text to read as follows:

800.53(A) Ceiling cavity plenums and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type CMD or Type CMP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CMD. The accessible portion of abandoned cables shall not be permitted to remain. Types CMD, CMP, CMR, CMG, CM, and CMX and communications wire installed in compliance with 300.22 shall be permitted. Listed plenum communications raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums. Only Type CMD and Type CMP cables shall be permitted to be installed in these raceways.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type CMD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type CMP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cabled and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-112.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-112 (Log #1665).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-142a Log #CP1607 NEC-P16 **Final Action: Accept**
(800-53(A))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Code-Making Panel 16

Recommendation:

Revise the fourth sentence of 800.53(A) as shown below:
"Listed plenum communications raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums."

Substantiation:

This change is required in order to correlate with NFPA 90A-2002.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JONES: The Panel uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

OHDE: The NEC already adequately covers wiring in spaces that provide environmental air -- whether these spaces are air ducts , air conditioning rooms, ceiling cavities, or raised floor cavities -- in 300.22(B) and 300.22(C). Other codes should not be deciding on the types of wiring methods to be used in these spaces. The electrical experts are capable of doing this, and it is covered quite well in 300.22. The more we let those outside of the NEC make these decisions the more we weaken adoption of the NEC. Also, we could make the change and there is nothing that requires a jurisdiction to even adopt 90A.

16-141 Log #191 NEC-P16 **Final Action: Accept in Principle**
(800-53(A), 820. 53(A) & 830.55(B))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc.

Recommendation:

Delete the sentence: "Abandoned cables shall not be permitted to remain."

Substantiation:

The proposal corrects errors in the 2002 NEC. The panel intent was to require the removal of the accessible portions of cables only and that requirement is in sections 725.3(B), 760.3(A), 770.3(A), 800.52(B), 820.3(A) and 830.3(A). The error arose when CMP 16 accepted Comments 16-64 and 16-87 for the 2002 NEC in addition to other actions. These Comments converted numerous exceptions into positive language. In preparing the Comments, I used language from the 1999 NEC and did not incorporate the accepted Proposals and other Comments for the 2002 NEC.

Panel Meeting Action: Accept in Principle

Delete the sentence:
"Abandoned cables shall not be permitted to remain." in 800.53(A), (B)(1), 820.53(A), (B)(1) and (D), 830.55(B) and (C)(1).

Panel Statement:

The panel renumbered 800.53 to new 800.61. See Proposal 16-14.
There was an omission in the original proposal.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: This proposal would also remove the requirement "Abandoned cables shall not be permitted to remain" within the plenum and riser sections that have been referenced here and replace it with "accessible portions of abandoned cables shall not be permitted to remain (from 800.52 (B); 820.3 (A); 830.3 (A)). Most submitters to this proposal did not strike out or change the requirement for the removal of abandoned cables in plenums and risers. However this accepted proposal makes this change. There is no technical substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be aloud to remain. "Inaccessible" could have a broad scope of meaning to installers or the AHJ.

Every effort to remove abandoned cables should be made. Therefore the requirements of 300.22 (B) should be complied with. Most cables installed per 300.22 (B) can be removed.

16-146 Log #878 NEC-P16 (800-53(B)(1)) **Final Action: Accept in Principle**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise the third sentence of 800.53 (B) (1) as follows:
The accessible portion of ~~A~~abandoned cables shall not be permitted to remain.

Substantiation:

Correlates with 800.52 (B) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 800.53(A), 820.53 (B) (1), 820.53 (D), 830.55 (C) (1), 725.61 (A) and 725.61 (B) (1).

Panel Meeting Action: Accept in Principle

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain."

Panel Statement:

Proposal 16-75 accomplished the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-141 (Log #191).

16-147 Log #1291 NEC-P16 (800-54) **Final Action: Reject**

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add new text to read as follows:
800.54 Communication Device and Equipment Mounting. Communication devices or equipment shall be mounted in listed boxes or assemblies designed for the purpose, and such boxes or assemblies shall be securely fastened in place. Boxes can either be completly enclosed or backless.
(A) Communication Devices and Equipment Mounted in Boxes. Communication devices or equipment shall be mounted in listed boxes and installed per 314.20.
(B) Communication Devices and Equipment Mounted on Covers. Communication device and equipment mounted to and supported by a cover shall be held rigidly against the cover which is mounted to the box.
(C) Wet Locations. Communication devices and equipment installed in a wet location shall use a cover that is listed for a wet location whether or not the device is in use.
FPN: See Article 100 for the definition of a "Wet Location".

Substantiation:

This proposals adds a new section to Article 800 addressing the mounting of devices or equipment to listed boxes. Currently, depending on the quality of workmanship, communication devices or equipment have not been mounted to boxes that can support them. After several years device and/or covers that are mounted directly to the dry wall will become hazard because they have become loose and exposed. Communication devices used in a wet location, as defined in Article 100, shall be protect from a shock hazard by an in-use weatherproof cover.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided no data supporting an existing hazard. The submitter offers only an individual opinion that, depending on the quality of workmanship, equipment or devices mounted directly to a dry wall may, over time, loosen and become a hazard. The addition of listed boxes or assemblies will not, in itself, guarantee a hazard-free installation. The same quality of workmanship is necessary to help ensure a hazard-free equipment installation whether listed boxes are used or not.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-148 Log #77b NEC-P16 (800-80) **Final Action: Accept**

TCC Action:

The Technical Correlating Committee understands that this proposal is modified by subsequent panel actions.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

[Recommendation of Proposal 16-148 is shown on page 2541]

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. Also, the listing requirement for multipurpose cables are deleted because the authorization to list multipurpose cables expires on July 1, 2003.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-149 Log #77c NEC-P16 (800-81) **Final Action: Accept**

TCC Action:

The Technical Correlating Committee understands that this proposal is modified by subsequent panel actions.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

[Recommendation of Proposal 16-149 is shown on page 2548]

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. Also, the listing requirement for multipurpose cables are deleted because the authorization to list multipurpose cables expires on July 1, 2003.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-150 Log #77d NEC-P16 **Final Action: Accept**
(800-82 (New))

TCC Action:

The Technical Correlating Committee understands that this proposal is modified by subsequent panel actions.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

[Recommendation of Proposal 16-150 is shown on page 2549]

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. Also, the listing requirement for multipurpose cables are deleted because the authorization to list multipurpose cables expires on July 1, 2003.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.
Section references are new, based upon pro forma restructure as per Proposal 16-70.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-151 Log #1586 NEC-P16 (810-21) **Final Action: Reject**

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 5 for information.

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

Revise Section 810.21 as follows:

810.21 Grounding Electrode Conductors — Receiving Stations.

Grounding electrode conductors shall comply with 810.21(A) through (J).

(A) Material. The grounding electrode conductor shall be of copper, aluminum, copper-clad steel, bronze, or similar corrosion-resistant material. 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 used outside, aluminum or copper-clad aluminum shall not be installed within 450 mm (18 in.) of the earth.

(B) Insulation. Insulation on grounding electrode conductors shall not be required.

(C) Supports. The grounding electrode conductors shall be securely fastened in place and shall be permitted to be directly attached to the surface wired over without the use of insulating supports.

Exception: Where proper support cannot be provided, the size of the grounding conductors shall be increased proportionately.

(D) Mechanical Protection. The grounding electrode conductor shall be protected where exposed to physical damage, or the size of the grounding electrode conductors shall be increased proportionately to compensate for the lack of protection. Where the grounding electrode conductor is run in a metal raceway, both ends of the raceway shall be bonded to the grounding electrode conductor or to the same terminal or electrode to which the grounding conductor is connected.

(E) Run in Straight Line. The grounding electrode conductor for an antenna mast or antenna discharge unit shall be run in as straight a line as practicable from the mast or discharge unit to the grounding electrode.

(F) Electrode. The grounding electrode conductor shall be connected as follows:

(1) To the nearest accessible location on the following:

a. The building or structure grounding electrode system as covered in 250.50

b. The grounded interior metal water piping systems, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52

c. The power service accessible means external to the building, as covered in 250.94

d. The metallic power service raceway

e. The service equipment enclosure, or

f. The grounding electrode conductor or the grounding electrode conductor metal enclosures; or

(2) If the building or structure served has no grounding means, as described in 810.21(F)(1), to any one of the individual electrodes described in 250.52; or

(3) If the building or structure served has no grounding means, as described in 810.21(F)(1) or (F)(2), to an effectively grounded metal structure or to any of the individual electrodes described in 250.52.

(G) Inside or Outside Building. The grounding electrode conductor shall be permitted to be run either inside or outside the building.

(H) Size. The grounding electrode conductor shall not be smaller than 10 AWG copper, 8 AWG aluminum, or 17 AWG copper-clad steel or bronze.

(I) Common Ground. A single grounding electrode conductor shall be permitted for both protective and operating purposes.

(J) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the radio and television equipment grounding electrode and the power grounding electrode system at the building or structure served where separate electrodes are used.

Substantiation:

This revision is required to establish consistent use of terms between Article 250 and Article 810. This change is consistent with a similar change to Section 250.32 in the 2002 NEC. This change is not intended to change any of the requirements of the Code. It is just a revision that will work to promote a common language of communication and consistent use of the terms for a conductor that performs the same functions but is currently titled differently.

Panel Meeting Action: Reject

Panel Statement:

The term "grounding electrode conductor" is specific to the conductor used to connect the grounding electrode(s) to the equipment grounding conductor, to the grounded conductor, or to both, at the service (see Article 100, "grounding electrode conductor"). The conductor of 800.40 is a true grounding conductor, used to connect the primary protector (grounded circuit of the communications system), to the power service ground (see Article 100, "grounding conductor").

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-152 Log #3179 NEC-P16 (810-21) **Final Action: Reject**

Submitter: Eric Stromberg, The Dow Chemical Company

Recommendation:

Remove Section 810.21 and replace with Section 810.40. 810.40 will be the same as 820.40 and 830.40. Word initial paragraph of 810.40 as follows:

Radio and television equipment shall be grounded as specified in 810.40(A) through (D).

Edit (B) Electrode to change the reference to 810.40(B)(1) and (B)(2).

Edit (B)(2) to change reference to 810.40 (B)(1)

Edit (B)(2)(1) to change reference to 820.40(B)(1) or (B)(2)(1)

If, in the judgment of the code panel, this section should be brought into further alignment with articles 820 and 830, then 810.41 and 810.42 should be created as well, with references to match.

Substantiation:

Bring 810 into alignment with 820 and 830. Currently, 810 is not very explicit when it comes to grounding and doesn't have many references to article 250.

Panel Meeting Action: Reject

Panel Statement:

The proposal is incomplete in that it does not provide the panel with a complete text to harmonize this section with the other Chapter 8 sections as requested by his substantiation.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-153 Log #3213 NEC-P16 (810-21(K)) **Final Action: Accept in Principle**

Submitter: Tom Baker, Puget Sound Electrical Training

Recommendation:

Add new section (K) connections to grounding electrodes shall comply with 250.70. Connectors, clamps, fittings, or lugs used to attach grounding conductors and bonding jumpers to grounding electrodes or to each other that are to be concrete-encased or buried in the earth shall be suitable for its application.

Substantiation:

In Chapter 8, Articles 800, 820 and 830 each have a section referring to Article 250 for the electrode connection. For example, Section 800.40 Cable and Primary Protector Grounding, Section (C) Electrode Connection "Connections to grounding electrodes shall comply with 250.70. Connectors, clamps, fittings, or lugs used to attach grounding conductors and bonding jumpers to grounding electrodes or to each other that are to be concrete-encased or buried in the earth shall be suitable for its application".

Article 810 has similar requirements to Articles 800, 820 and 830 for the grounding conductor used to bond the antenna mast and antenna discharge unit to an electrode, however, 810.21 Grounding Conductors-Receiving Stations, has no reference to 250.70 for connection of the grounding conductor to the electrode system. Without the reference to 250.70 (as do 800.40(C), 820.40(C) and 830.40(C)), the installer could use any type of connection, and this would be allowed per 90.3 Code Arrangement.

Many antennas are installed with out the mast being grounded at all, or to an isolated electrode. As small dish antenna systems are becoming very common, a reference to Section 250.70 will ensure proper installation. In addition this new language will make Article 810 consistent with the other Chapter 8 articles.

Panel Meeting Action: Accept in Principle

Add new section (K) to read:

"(K) Electrode Connection. Connections to grounding electrodes shall comply with 250.70."

Panel Statement:

This change satisfies the submitter's intent but uses the language in 820.40(C). Similar language should be used for similar requirements in all the articles of Chapter 8. See also 16-97a (Log #CP1608).

Section 250.70 provides the necessary requirements.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-154 Log #125 NEC-P16 (820) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the action on this proposal is modified by Proposals 16-9, 16-13, 16-14, 16-15, 16-21, 16-23, 16-24, 16-27, 16-28, 16-46, 16-56, 16-64, 16-128, 16-137, 16-141, 16-160, 16-161, 16-163, 16-164, 16-165, 16-166, 16-175, 16-177, 16-190, 16-194, and 16-211a.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber the sections within Articles 725, 760, 770, 800, 820 & 830 as shown on the following table. For information, the following are pro forma rewrites of the Articles assuming that the individual proposals are accepted.

[Recommendation of Proposal 16-154 is shown on page 2550]

Insert Table Here

(Table shown on page 2762)

Insert Artwork (Figure 820.61) Here

Insert Table 820.61 Here

(Table shown on page 2762)

Substantiation:

Section 2.4.1 of the 2001 National Electrical Code Style Manual states:
2.4.1 Parallel Numbering Within Similar Articles. To the extent possible, Code-Making Panels are encouraged to use the same section numbers (and part numbers, where applicable) for the same purposes within articles covering similar subjects.
The CMP 16 Editorial Task Group has prepared a series of proposals such that these Articles conform with the intent of the Style Manual. The Task Group includes myself, S. Egesdal, S. Kaufman, S. Johnson, J. Brunssen, G. Dorna, D. Pirkle and M. Wierenga. Work was undertaken after consultation with the TCC chairman.

Panel Meeting Action: Accept in Principle

The panel restructured this Article as shown in the pro forma rewrite.

Panel Statement:

The panel accepts the restructure only. Text changes are addressed in other proposals. The restructure did not change any technical requirements. Restructuring was accomplished by a series of specific proposals.The panel accepts this action to comply with the Nec Style Manual, Section 2.4.1.
See actions on Proposals 16-155, 16-157, 16-186, 16-23, 16-14, 16-187, 16-166, 16-171, 16-161, 16-159.
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-155 Log #61c NEC-P16 (820-3) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete "Locations and" from the title of these sections to make the section titles "Other Articles."

Substantiation:

The current titles are not in agreement with the 2001 National Electrical Code Style Manual sections 2.5 and 3.3.5.
In the 2002 NEC, the following sections all have the title "Other Articles": 225.2; 372.3; 402.2; 445.3; 500.3; 505.3; 518.3; 545.2; 547.3; 604.3; 650.2; 668.3; 705.2 and 720.2.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-156 Log #1759 NEC-P16 (820-3) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

820.3 Locations and Other Articles.

Circuits and equipment shall comply with 820.3(A) through (G).

(A) Spread of Fire or Products of Combustion. Section 300.21 shall apply. The accessible portion of abandoned coaxial cables shall not be permitted to remain.

(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22, where installed in ducts or plenums or other air-handling spaces ~~spaces used for environmental air,~~ shall apply. Type CATVP cables shall be permitted for community antenna television cables installed in plenums, including ceiling cavity plenums and raised floor plenums. Wiring methods installed in a plenum space shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the plenum space.

Exception: As permitted in 820.53(A).

(C) Installation and Use. Section 110.3 shall apply.

(D) Installations of Conductive and Nonconductive Optical Fiber Cables. Article 770 shall apply.

(E) Communications Circuits. Article 800 shall apply.

(F) Network-Powered Broadband Communications Systems. Article 830 shall apply.

(G) Alternate Wiring Methods. The wiring methods of Article 830 shall be permitted to substitute for the wiring methods of Article 820.

FPN: Use of Article 830 wiring methods will facilitate the upgrading of Article 820 installations to network-powered broadband applications.

Substantiation:

[Text of Proposal 16-156 substantiation is shown on page 2554]

Panel Meeting Action: Reject

Panel Statement:

See action on Proposal 16-12.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-157 Log #62i NEC-P16 (820-5) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-158 Log #862 NEC-P16 (820-5) **Final Action: Reject**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 820.5 as follows:

820.5 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an excess accumulation of wires and cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 820.5 has been misinterpreted to mean that wires and cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when 820.5 was introduced into the 1993 NEC. At that time CMP 16 stated in response to a similar proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of wires and cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited wire and cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of wire and cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 640.5, 725.5, 760.5, 770.7, 800.5, and 830.6.

Panel Meeting Action: Reject

Panel Statement:

No additional clarification of the existing provision has been provided. The proposal does not change the requirement.

820.5 becomes new 820.7.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-159 Log #62j NEC-P16 (820-6) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-160 Log #852 NEC-P16 (820-6) **Final Action: Accept in Principle**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 820.6 as follows:

820.6 Mechanical Execution of Work. Community antenna television and radio distribution systems shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the ~~structural components of the~~ building structure in such a manner that the cable is not damaged by normal building use. Such cables shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D).

Substantiation:

Section 820.6 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (820.6). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables. It also makes "ceiling" plural. This is a companion proposal and is intended to correlate with similar proposals for 800.6, 830.7, 640.6, 725.6, 760.6, and 770.8.

Panel Meeting Action: Accept in Principle

Change 820.6 to read as follows:

820.6 Mechanical Execution of Work. Community antenna television and radio distribution systems 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 straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D) and 300.11.

FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2001, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.

Panel Statement:

The panel modified the proposal to clarify the submitter's intent. Addition of the FPN incorporates Proposal 16-82 to accommodate a parallel structure throughout Articles 770, 800, 820 and 830.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

HUGHES: I feel conformance to 300.11 for this application is overly restrictive. I agree with all other elements of the proposal.

JONES: The submitter’s proposal changes in the text did not add clarity or change to the requirements of Article 820.6. The panel added a reference to Article 300.11 to the text, but did not furnish any evidence or technical support that a need or a safety issue exists justifying the reference to the additional installation requirements of Article 300.11.

Comment on Affirmative:

BRUNSSEN: While I agree with the Panel's acceptance of the proposal, I do not agree with the new, added requirement that the installation conform to 300.11. 300.11 is appropriate for power cable assemblies that are heavier and larger than coaxial CATV cables. A coaxial CATV cable used for premises wiring is typically less than one-quarter inch in diameter and carries no power. Modifications typically involve the installation of a single, or at most, a few additional coaxial cables. 300.11(A) does not permit coaxial cables to be supported by ceiling grid support wires. However, approved hardware is currently available for this purpose. 300.11(C) does not permit cables to be used as a support.

However, as a CATV system evolves, coaxial cables are often installed over an extended period of time and lashed together in a "cable assembly". It is overly restrictive to specify that each addition of a single coaxial cable require installation of additional and separate supports.

JOHNSON: See my Comment on Affirmative on Proposal 16-20.

16-161 Log #90 NEC-P16 **Final Action: Accept**
(820-10, 820.11 and 830.11)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 820.10 and 820.11 to be 820.11 and 820.12, respectively.
Rename new Section 820.11 "Overhead Cables" and new section 820.12 "Underground Circuits Entering Buildings" to be consistent with Article 800.
Rename Section 830.11 "Overhead Cables".
In the first sentence of 820.10 (new 820.11), change "820.10(A)" to "820.11(A)".
In 820.10(F) (new 820.11(F)), change "820.10(F)" to "820.11(F)".
In the first sentence of 830.11, change "powered" to "network-powered".

Substantiation:

With this change, sections 820.10 through 820.14 (x = 0 or 2 or 3) will line up in Articles 800, 820 and 830. This change will improve editorial consistency between articles and comply with section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-162 Log #1587 NEC-P16 (820-40) **Final Action: Reject**

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 5 for information.

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

820.40 Cable Grounding.

Where required by 820.33, the shield of the coaxial cable shall be grounded as specified in 820.40(A) through (D).

(A) Grounding Electrode Conductor.

(1) Insulation. The grounding electrode conductor shall be insulated and shall be listed as suitable for the purpose.

(2) Material. The grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.

(3) Size. The grounding electrode conductor shall not be smaller than 14 AWG. It shall have a current-carrying capacity approximately equal to that of the outer conductor of the coaxial cable. The grounding electrode conductor shall not be required to exceed 6 AWG.

(4) Length. The grounding electrode conductor shall be as short as practicable. In one- and two-family dwellings, the grounding electrode conductor shall be as short as practicable, not to exceed 6.0 m (20 ft) in length.

Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum grounding electrode conductor length of 6.0 m (20 ft), a separate ground as specified in 250.52(A)(5), (6), or (7) shall be used, the grounding electrode conductor shall be grounded to the separate ground in accordance with 250.70, and the separate ground bonded to the power grounding electrode system in accordance with 820.40(D).

(5) Run in Straight Line. The grounding electrode conductor shall be run to the grounding electrode in as straight a line as practicable.

(6) Physical Protection. Where subject to physical damage, the grounding electrode conductor shall be adequately protected. Where the grounding electrode conductor is run in a metal raceway, both ends of the raceway shall be bonded to the grounding electrode conductor or the same terminal or electrode to which the grounding electrode conductor is connected.

(B) Electrode. The grounding electrode conductor shall be connected in accordance with 820.40(B)(1) and (B)(2).

(1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:

(1) The building or structure grounding electrode system as covered in 250.50;

(2) The grounded interior metal water piping system, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52;

(3) The power service accessible means external to enclosures as covered in 250.94;

(4) The metallic power service raceway;

(5) The service equipment enclosure;

(6) The grounding electrode conductor or the grounding electrode conductor metal enclosure; or

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is grounded to an electrode as covered in 250.32.

(2) In Buildings or Structures Without Grounding Means. If the building or structure served has no grounding means, as described in 820.40(B)(1):

(1) To any one of the individual electrodes described in 250.52(A)(1), (2), (3), (4); or,

(2) If the building or structure served has no grounding means, as described in 820.40(B)(1) or (B)(2)(1), to an effectively grounded metal structure or to any one of the individual electrodes described in 250.52(A)(5), (6), and (7).

(C) Electrode Connection. Connections to grounding electrodes shall comply with 250.70.

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the antenna systems grounding electrode and the power grounding electrode system at the building or structure served where separate electrodes are used.

the building or structure served where separate electrodes are used.

Exception: At mobile homes as covered in 820.42.

FPN No. 1: See 250.60 for use of air terminals (lightning rods).

FPN No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.

Substantiation:

This revision is required to establish consistent use of terms between Article 250 and Article 820. This change is consistent with a similar change to Section 250.32 in the 2002 NEC. This change is not intended to change any of the requirements of the Code. It is just a revision that will work to promote a common language of communication and consistent use of the terms for a conductor that performs the same functions but is currently titled differently.

Panel Meeting Action: Reject

Panel Statement:

The term "grounding electrode conductor" is specific to the conductor used to connect the grounding electrode(s) to the equipment grounding conductor, to the grounded conductor, or to both, at the service (see Article 100, "grounding electrode conductor"). The conductor of 800.40 is a true grounding conductor, used to connect the primary protector (grounded circuit of the communications system), to the power service ground (see Article 100, "grounding conductor").

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-163 Log #847 NEC-P16 (820-40(A)(4)) **Final Action: Accept**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Add fine print note to 820.40(A)(4) as follows:
"FPN: Similar grounding conductor length limitations applied at apartment buildings and commercial buildings will help to reduce voltages that may be developed between the building's power and communications systems during lightning events."

Substantiation:

When the 20-foot limitation was instituted in the 2003 NEC, apartment and commercial buildings were specifically not addressed as it was felt the predominant issue was in one- and two-family dwellings. In retrospect, some guidance should be provided for apartment and commercial buildings, without being overly restrictive because of intersystem bonding situations that may exist at these facilities. The proposed FPN provides guidance for the treatment of the cable shield grounding conductor length at apartment and commercial buildings, consistent with the new 20-foot rule for one- and two-family dwellings, but does not place untenable restrictions on the actual length. This is a companion proposal and is intended to correlate with similar proposals for 800.40 (A)(4) and 830.40(A)(4).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

TODD: See my Explanation of Negative for Proposal 16-96 (Log #846).

Comment on Affirmative:

16-164 Log #341 NEC-P16 (820-40(D)) **Final Action: Accept**

Submitter: Steven C. Johnson, Time Warner Cable / Rep. National Cable Telecommunications Association

Recommendation:

(D) Bonding of Electrodes. A bonding jumper not smaller than No. 6 copper or equivalent shall be connected between the community antenna television system's grounding electrode and the power grounding electrode system at the building or structure served where separate electrodes are used.

Exception: At mobile homes as covered in Section 820-42.

FPN No. 1: See Section 250-60 for use of air terminals (lightning rods).

FPN No. 2: Bonding together of all separate electrodes will limit potential differences between them and their associated wiring systems.

Substantiation:

Editorial correction.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-165 Log #1292 NEC-P16 **Final Action: Accept**
(820-48)

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add new text to read as follows:
V. Cables Within Buildings
820.48 Raceways for Coaxial Cables. Where Coaxial Cables are installed in a raceway, the raceway shall be either of a type permitted in Chapter 3 and installed in accordance with Chapter 3 or a listed nonmetallic raceway complying with 820.51(E), (F), or (G), as applicable, and installed in accordance with 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing apply.
Exception: Conduit fill restrictions shall not apply.

Substantiation:

This is the first of three companion proposals to add Nonmetallic Coaxial Raceways to Article 820. The same listed raceways are currently found in Articles 770 and 800 for Optical Fiber and Communication Cables. These raceways are commonly being used for the removal of abandon cables and are ideal for coaxial cables.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-166 Log #83 NEC-P16 **Final Action: Accept**
(820-50)

TCC Action:

The Technical Correlating Committee understands that this proposal is further modified by Proposal 16-170.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise Section 820.50 as follows:
820.50 Installation of Coaxial Cables. Listed coaxial cables shall be installed as wiring within buildings.
Exception: Unlisted outside plant coaxial cables shall be permitted where the length of unlisted cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated at a grounding block.

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3 and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. This proposal revises Section 820.50 to cover installation requirements only since the listing requirements are detailed elsewhere. Furthermore, the existing Exception No. 2 is deleted because it became redundant when the definition of "point of entrance" was added to the definitions section in the 1999 NEC.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-167 Log #867 NEC-P16 (820-50) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 820.50, Exception No. 3 as follows:

Exception No. 3: Unlisted outside plant coaxial cables shall be permitted within buildings in spaces other than ceiling cavity plenums and raised-floor plenums. ~~Listing and marking shall not be required where the~~ The length of the unlisted cable permitted within the building, measured from its point of entrance, ~~does~~ shall not exceed 15 m (50 ft). ~~and the~~ The unlisted cable shall enter~~s~~ the building from the outside and ~~is~~ shall be terminated at a grounding block.

Substantiation:

The NEC presently permits up to 50 ft of unlisted outside plant cable to be run into a building, but places no restriction on installing the unlisted cables in air handling spaces where they could contribute to fire and smoke hazard. This proposal adds that restriction, further contributing to fire and smoke safety. A similar proposal is being submitted by the *NFPA Technical Committee on Air-Conditioning* to correlate with requirements for cables in plenums contained in NFPA 90A, that has primary jurisdiction for combustible materials used in air ducts and plenum spaces. This is a companion proposal and is intended to correlate with similar proposals for 800.5 and 770.50.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action in Proposal 16-170. The current Code allows 50 feet of unlisted (outside plant) entrance cable in the building without restriction. This proposal would correct part of the problem by prohibiting entrance cable from being installed in ceiling cavity plenums and raised floor plenums. The solutions offered by Proposals 16-31, 16-107 and 16-170 are more comprehensive and include the submitter's intended wording; they prohibit unlisted (outside plant) entrance cable from being installed in risers, air ducts and all plenums. Accordingly, the panel has accepted Proposals 16-31, 16-107 and 16-170 and accepts this proposal in principle.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums and raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-168 Log #2576 NEC-P16 (Table 820-50) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Table 820.50 as shown below.

INSERT Table 820.50 HERE

(Table shown on page 2769)

Substantiation:

This proposal is a companion proposal to the limited fire hazard cable proposals for change to Sections 820.51 and 820.52 in order to correlate with the cable listing requirements in NFPA 90A-2002.

Panel Meeting Action: Accept in Principle

See panel action in Proposal 16-177.

Panel Statement:

See panel statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-169 Log #331 NEC-P16 **Final Action: Accept in Principle**
(820-50 Exception No. 3)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: L. Jeffrey Mattern, FM Global

Recommendation:

Revise Section 820.50 Exception No. 3 as follows:

Exception No. 3: Unlisted outside plant coaxial cables shall be permitted within building spaces other than ceiling cavity plenums and raised floor plenums ~~Listing and marking shall not be required~~ where the length of the unlisted cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated at a grounding block.

Substantiation:

The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A.

The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis.

Combustible materials located in plenum spaces are limited as to their flammability and to the development of smoke under standard fire exposures. The purpose of the limitation is to reduce the risk of fire spreading within the concealed spaces that are used for the transportation of environmental air. Fires in these spaces can become extremely hazardous because they can be undetected due to the concealed nature of the space. Smoke can also be rapidly spread throughout the building from the air handling system.

This proposal uses the terms "ceiling cavity plenum" and "raised floor plenum" to improve correlation between the NEC and NFPA 90A. A separate proposal has been made to put the appropriate definition in Article 100. This proposal prohibits the use on unlisted (non-fire retardant) outside plant cable in plenums in order to correlate with NFPA 90A.

NFPA 90A (1999) in sections 2-3.10.2 and 2-3.10.6 has established requirements for cables in plenums.

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

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action in Proposal 16-170. The current Code allows 50 feet of unlisted (outside plant) entrance cable in the building without restriction. This proposal would correct part of the problem by prohibiting entrance cable from being installed in ceiling cavity plenums and raised floor plenums. The solutions offered by Proposals 16-31, 16-107 and 16-170 are more comprehensive and include the submitter's intended wording; they prohibit unlisted (outside plant) entrance cable from being installed in risers, air ducts and all plenums. Accordingly, the panel has accepted Proposals 16-31, 16-107 and 16-170 and accepts this proposal in principle.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums and raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-170 Log #1077 NEC-P16 **Final Action: Accept**
(820-50 Exception No. 3)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise Section 820.50 Exception No. 3 as follows:
Exception No. 3: Unlisted outside plant coaxial cables shall be permitted within buildings in spaces other than risers, air ducts, ceiling cavity plenums, raised floor plenums, duct distribution plenums, apparatus casing plenums, and air-handling unit room plenums where the length of unlisted coaxial cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the unlisted coaxial cable enters the building from the outside and is terminated at a grounding block.

Substantiation:

Unlisted outside plant entrance cables are sometimes run in risers, ducts and plenums. When the 50-foot exemption for outside plant cable was adopted, it was assumed that the entrance cable would go into an equipment room. It was not envisioned that the unlisted cable, which is not fire resistant, would run up a riser, in an air duct or plenum.

Panel Meeting Action: Accept

Panel Statement:

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: While I agree with the Panel's intent of revising the FPN, CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "spaces other than risers, air ducts, ceiling cavity plenums, raised floor plenums duct distribution plenums, apparatus casing plenums and air-handling unit room plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter uses the terms "ceiling cavities" and "raised-floor" which are not presently used or defined in the code with out any substantiation. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in restriction of wiring methods within those areas without additional technical substantiation.

16-175 Log #1293 NEC-P16 (820-51) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:

820.51 Additional Listing Requirements. Cables and raceways shall be listed in accordance with 820.51(A) through ~~(D)~~ (G).

(A) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method for Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(B) Type CATVR. Type CATVR community antenna television riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(C) Type CATV. Type CATV community antenna television cable shall be listed as being suitable for general-purpose CATV use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.

(D) Type CATVX. Type CATVX limited-use community antenna television cable shall be listed as being suitable for use in dwellings and for use in raceway and shall also be listed as being resistant to flame spread.

FPN: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

(E) Plenum Coaxial Raceways. Plenum coaxial raceways listed as plenum coaxial raceways shall be permitted for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

(F) Riser Coaxial Raceway. Riser coaxial raceways shall be listed as having adequate fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

(G) General-Purpose Coaxial Raceway. General-purpose coaxial raceways shall be listed as being resistant to the spread of fire.

Substantiation:

This is the second of three companion proposals to add Nonmetallic Coaxial Raceways to Article 820. The same listed raceways are currently found in Articles 770 and 800 for Optical Fiber and Communication Cables. These raceways are commonly being used for the removal of abandon cables and are ideal for coaxial cables.

Panel Meeting Action: Accept in Principle

Modify the proposal by the following:

Change proposer's (E) to read as follows:

"(E) Plenum Coaxial Raceways. Plenum coaxial raceways shall be listed as having adequate fire-resistant and low smoke-producing characteristics."

Add a FPN after (E) to define adequate fire-resistant and low smoke-producing characteristics for raceway as follows:

"FPN: For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for optical fiber and communications plenum raceways effectively defines raceways having "adequate fire-resistant characteristics" as raceways having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with UL 2024, Standard for Safety Optical-Fiber Cable Raceway. Likewise, it effectively defines raceways having "low smoke-producing characteristics" as raceways having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the same test."

Add a fine print note after (F) to read as follows:

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the raceways pass the requirements of the test for Flame Propagation (riser) in UL 2024, Standard for Optical Fiber Cable Raceway.

Add a fine print note after (G) to read as follows:

FPN: One method of defining resistance to the spread of fire is that the raceways pass the requirements of the Vertical-Tray Flame test (General use) in UL 2024, Standard for Optical Fiber Cable raceway.

Panel Statement:

The addition of the FPNs add the necessary guidance and correlation within the Article. 820.51 was relocated to 820.82 by Proposal 16-171. In Section (E), the panel removed the use requirement as this is a listing section.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

Comment on Affirmative:

DORNA: Proposal 16-194 changed "coaxial raceways" to "CATV raceways". The same change should have been

made in this proposal.

16-180 Log #1760 NEC-P16 (820-51) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

820.51 Additional Listing Requirements.

Cables shall be listed in accordance with 820.51(A) through (D).

(A) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ~~ducts, plenums and other space used for environmental air~~ plenums, including ceiling cavity plenums and raised floor plenums, as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method for Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(B) Type CATVR. Type CATVR community antenna television riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

(C) Type CATV. Type CATV community antenna television cable shall be listed as being suitable for general-purpose CATV use, with the exception of risers and plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as being resistant to the spread of fire.

FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-180 substantiation is shown on page 2567]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal would list cables for unrestricted use in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-171 Log #84 NEC-P16 **Final Action: Accept**
(820-51, 820-3(B), & 820-82 (New))

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete section 820.51 Additional Listing Requirements.
In 820.3(B) Exception change "820.53(A)" to "820.61(A)".
Create a new section VI "Listing Requirements":
VI Listing Requirements
820.82 Coaxial Cables. Coaxial cables shall be listed in accordance with 820.82(A) through (D).
(A) Type CATVP. Type CATVP community antenna television plenum cable shall be marked Type CATVP and be listed as suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.
FPN: One method of defining low smoke-producing cables is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method for Test for Flame Travel and Smoke of Wire and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.
(B) Type CATVR. Type CATVR community antenna television riser cable shall be marked Type CATVR and be listed as suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.
FPN: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.
(C) Type CATV. Type CATV community antenna television cable shall be marked Type CATV and be listed as being suitable for general-purpose CATV use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.
FPN: One method of defining resistant to the spread of fire is that the cables do not spread fire to the top of the tray in the vertical-tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-1985, Test Methods for Electrical Wires and Cables.
(D) Type CATVX. Type CATVX limited-use community antenna television cable shall be marked Type CATVX and be listed as suitable for use in dwellings and for use in raceway and shall also be listed as being resistant to flame spread.
FPN: One method of determining that cable is resistant to flame spread is by testing the cable to the VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and Fire Alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-184 Log #3025 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Figure 820.53, Table 820.50, Table 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Bob Allen, Mohawk/DCT

Recommendation:

[Text of Proposal 16-184 recommendation is shown on page 2584]

Substantiation:

[Text of Proposal 16-184 substantiation is shown on page 2585]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-173 Log #1144 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Figure 820.53, Table 820.53 & Table 820.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Gerald Lee Dorna, Belden Wire & Cable

Recommendation:

Revise as follows:

820.51 Additional Listing Requirements. Cables shall be listed in accordance with 820.51(A) through (E~~D~~).

(A) Type CATVD. Type CATVD community antenna television duct cable shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(B~~A~~) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ceiling cavity and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; and "D" to "E".

Revise Table 820.50 as shown:

INSERT TABLE 820.50 HERE

(Table shown on page 2770)

Revise Sections 820.53(A) and (C), Table 820.53 and Figure 820.53 as shown. The other sections do not change.

INSERT FIGURE 820.53 HERE

820.53 Applications of Listed CATV Cables. CATV cables shall comply with the requirements of 820.53(A) through (D) or where cable substitutions are made as shown in Table 820.53.

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CATVD and shall be associated with the air duct system. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CATVD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CATVD cable shall be mechanically protected to a height of 7 feet above the floor. Listed coaxial cables installed in compliance with Section 300.22 shall be permitted.

(b~~A~~) ~~Plenum~~. Cables installed in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type CATVD or Type CATVP. Abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(C) Cable Trays. Cables installed in cable trays shall be Types CATVD, CATVP, CATVR, and CATV.

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 725.61 and similar sections in Articles 760, 770, 800, 820 and 830, permit plenum (CL2P, CL3P, CMP, etc.) cable to be installed in "ducts, plenums, and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the air-conditioning committee to restrict plenum cable (CL2P, CL3P, CMP etc.) to ceiling cavity and raised floor plenums, leads one to asl "Are there applications where it is necessary to put cables inside of air ducts and plenums other

than ceiling cavity plenums and raised floor plenums". The answers is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum able (CL2P, CL3P, CMP etc.), what kind of cable would meet the requirements of NFPA 90A."

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50

3) Listed plenum cable that is the equivalent of CL2P, CL3P, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish 'limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for use in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (CL2P, CL3P, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002.

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (OFNP, FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

QHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666)

ORDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-177 Log #1666 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Figure 820.53, Table 820.53 & Table 820.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

[Text of Proposal 16-177 recommendation is shown on page 2564]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 820.53 and similar sections in Articles 725, 760, 770, 800 and 830, permit plenum (CATVP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CATVP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CATVP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CATVP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Types CL2D and CL3D, duct have significantly lower fuel load and lower smoke production than conventional Types CL2P and CL3P plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors offices, clean rooms, laboratories, strip malls etc

Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum, and in inaccessible ceiling cavity and raised floor plenums. It also permits duct cable to substitute for current plenum cable (FPLP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution table and figure have been simplified in order to make them easier to understand. Likewise the cable marking table has been

simplified. The requirement for the removal of abandoned cables has been removed because it is redundant.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Change "community antenna television duct cable(s)" to "community antenna television air duct cable(s)" in all locations. Change "CATV duct cable(s)" to "CATV air duct cable(s)" in all locations. In Table 820.53 and Figure 820.53, remove "CMG".

Panel Statement:

The panel added the word "air" to the term "duct cable(s)" because the term "duct cable(s)" is too general and could lead to confusion by the user. The term "air duct cable(s)" is much more descriptive. The term "air duct" is defined in NFPA 90A and in proposed revision to this Article. See Proposal 16-9.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

820.51 becomes new 820.82.

820.53 becomes new 820.61.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: If approved this proposal would allow cables other than listed in 300.22 (B) to be installed in air duct used for environmental air. This proposal list cables that are not contained in 300.22 (B). There is no reason to place ANY combustible cable product in an environmental air duct and this proposal would violate 300.22 (B). This proposal could lead to the use of "air duct" as a raceway for uses other than "necessary for their direct action on, or sensing of, the contained air". The majority of installed air duct control and sensing is run external to the air duct and is run in raceway. In large air handling environments where there may be a need for internal wiring/cabling the cables are MC, MI or in metallic raceway per 300.22 (B). Most, if not all, applications of energy management control fit into the two methods listed above.

This proposal would also remove the requirement "Abandoned cables shall not be permitted to remain" within the plenum and riser sections that have been referenced here and replace it with "accessible portions of abandoned cables shall not be permitted to remain (from 820.3 (A)). Most submitters to this proposal did not strike out or change the requirement for the removal of abandoned cables in plenums and risers. However this accepted proposal makes this change. There is no technical substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be aloud to remain. "Inaccessible" could have a broad scope of meaning to installers or the AHJ.

Every effort to remove abandoned cables should be made. Therefore the requirements of 300.22 (B) should be complied with. Most cables installed per 300.22 (B) can be removed.

Further the NEC already adequately covers wiring in spaces that provide environmental air -- whether these spaces are air ducts

Further the NEC already adequately covers wiring in spaces that provide environmental air -- whether these spaces are air ducts, air conditioning rooms, ceiling cavities, or raised floor cavities -- in 300.22(B) and 300.22(C). Other codes should not be deciding on the types of wiring methods to be used in these spaces. The electrical experts are capable of doing this, and it is covered quite well in 300.22. The more we let those outside of the NEC make these decisions the more we weaken adoption of the NEC. Also, we could make the change and there is nothing that requires a jurisdiction to even adopt 90A.

In addition, we do not find that the 90A Committee has even determined itself what minimum requirements are needed for testing electrical wiring. According to one of the speakers, 90A
agreed to the proposals for coordination, but did not originate the proposals that introduce the new "air duct" cable. This appears to be an effort designed to purport on one hand that this is what 90A wants; then when they take it to 90A this summer it will be presented as a "done deal"
at the NEC. There is far from consensus among the NEC committees and Panel 16 appears to be the strongest proponents.

The real action that needs to be taken is to rename "plenum cable", because technically the Code does not permit it in 300-22(B) applications and it is being misapplied by designers."

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-178 Log #1695 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Figure 820.53, Table 820.53 & Table 820.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Patricia Jenks, Krone Digital Communications

Recommendation:

[Text of Proposal 16-178 recommendation is shown on page 2565]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 800.53 and similar sections in Articles 725, 760, 770,
820 and 830, permit plenum (OFNP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (OFNP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such
as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (OFNP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?

In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of OFNP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.
NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.
Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum. It also permits duct cable to substitute for current plenum cable (OFNP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included.

The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals. The revised cable substitution figure has been simplified in order to (hopefully) make it easier to understand.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to
wiring and cable methods used in ducts and plenums that move environmental air. The
Technical Committee on Air Conditioning has been assigned the primary jurisdiction for
the limitations of combustible materials used in air ducts and plenum spaces. This
includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for

the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air- Conditioning Committee's proposals to ban combustible plenum cables (OFNP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-179 Log #1706 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Figure 820.53, Table 820.53 & Table 820.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Robert Dennelly, Avaya

Recommendation:

[Text of Proposal 16-179 recommendation is shown on page 2566]

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems.* One of the issues addressed in their proposals is that NEC section 820.53 and similar sections in Articles 725, 760, 770, 800 and 830, permit plenum (CATVP, FPLP, CMP etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CATVP, FPLP, CMP etc.) to ceiling cavity and raised floor plenums, leads one to ask "Are there applications where it is necessary to put cables inside of air ducts and plenums other than ceiling cavity plenums and raised floor plenums." The answer is "Yes, it is necessary to place cables inside of air ducts and plenums such as air-handling unit room plenums for various security, sensing and control applications. That then leads to the next question, "If not plenum cable (CATVP, FPLP, CMP etc.), what kind of cable would meet the requirements of NFPA 90A?
In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:

1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CATVP, FPLP, CMP etc, cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "duct cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for duct cable.

In summary, this proposal establishes duct cable for used in air ducts and plenums, other than ceiling cavity and raised floor plenums, in applications associated with the duct or plenum, and in inaccessible ceiling cavity and raised floor plenums. It also permits duct cable to substitute for current plenum cable (FPLP, CMP etc.) because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited combustible cables versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. See also, the article I have provided: "Burning Issue - New Plenum Cable Enhances Fire Safety" from the February 2001 issue of "Cabling Business Magazine," by Dr. Xiaomei Fang and Dr. Andrew Bushelman of Avaya.

Two paragraphs from the substantiation to the proposals from the Air-Conditioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other that ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP etc.) from air ducts and plenums, other than ceiling cavity plenums and raised floor plenums, would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the code panel passes the proposal with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Note: Supporting Material available for review at NFPA headquarters.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-181 Log #1852 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Figure 820.53, Table 820.53 & Table 820.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise text to read as follows:

820.51 Additional Listing Requirements.

Cables shall be listed in accordance with 820.51(A) through (E~~D~~).

(A) Type CATVD. Type CATVD community antenna television duct cable shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(B~~A~~) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ceiling cavity and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining existing subparagraphs as follows: "B" to "C"; "C" to "D"; and "D" to "E".

Revise Table 820.50 as shown.

Insert Table 820.50 Here

(Table shown on page 2772)

Revise Sections 820.53(A), and (C), Table 820.53, and Figure 820.53 as shown. The other sections do not change.

820.53 Applications of Listed CATV Cables.

CATV cables shall comply with the requirements of 820.53(A) through (D) or where cable substitutions are made as shown in Table 820.53.

(A) Air Ducts and Plenums.

Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CATVD and shall be associated with the air duct system. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CATVD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CATVD cable shall be mechanically protected to a height of 7 ft above the floor. Listed coaxial cables installed in compliance with Section 300.22 shall be permitted.

(b~~A~~) ~~Plenum.~~ Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type CATVD or Type CATVP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CATVD. The accessible portion of ~~Abandoned~~ abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, AND CATVX cables installed in compliance with 300.22 shall be permitted.

FPN: Plenums described in NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.

(C) Cable Trays. Cables installed in cable trays shall be Types CATVD, CATVP, CATVR, and CATV.

Revise Table 820.53 as shown:

Insert Table 820.53 Here

(Table shown on page 2772)

Revise Figure 820.53 Cable Substitution Hierarchy, as shown below.

Insert Artwork (Fig. 820.53) Here

Substantiation:

I am a member of the 90A Committee who worked on the 2002 90A Standard and voted in favor of the listing requirement for "limited combustible cable"*, which is now included in the document. However, the 2002 edition of the 90A Standard does not address the installation of wire and cable in ducts and plenums, other than ceiling cavity plenums and raised floor plenums.

Since there are field applications where cables are installed inside ducts and other than ceiling cavity plenums and raised floor plenums, it seems prudent that the Class of cables described herein should be required since they meet all the requirements for supplementary materials plus they meet all the requirements for use in ceiling cavity and raised floor plenums.

Since these cables are inaccessible, it is not feasible to remove them. Therefore, a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Based on extensive work by the FPRF, the Types of cables described herein have significantly lower fuel load and lower smoke production than conventional plenum cables Types.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording contained in proposals submitted by the 90A Committee. The cable substitution table and figure have been revised in order to make them easier to understand.

*Note: The term limited combustible was not used in the proposed text. The Standards Council, in a recently, directed that this term not be used for cables.

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed for duct cable.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-183 Log #2443 NEC-P16 **Final Action: Accept in Principle**
(820-51, 820.53, Table 820.0, Figure 820.53, Table 820.53 & Table 820.50)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

[Text of Proposal 16-183 recommendation is shown on page 2579]

Substantiation:

[Text of Proposal 16-183 substantiation is shown on page 2580]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-174 Log #1149 NEC-P16 **Final Action: Reject**
(820-51, Table 820.50, 820.53(A), Table 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Richard Fransen, Daiken America, Inc.

Recommendation:

Revise 820.51 as shown below:

820.51 Additional Listing Requirements. Cables shall be listed in accordance with 820.51(A) through (~~D~~E).

(A) Type CATVD. Type CATVD community antenna television duct cable shall be listed as being suitable for use in ducts, plenums and other space used for environmental air and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceedng 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.

(~~A~~B) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ~~ducts~~, ceiling cavity and raised floor plenums, ~~and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.

Renumber the remaining subparagraphs as follows:
"B" to "C"; "D" to "E".

Revise Table 820.50 as shown below:

INSERT TABLE 820.50 HERE

(Table shown on page 2771)

Revise Section 820.53(A), Table 820.53 and Figure 820.53 as shown below.

820.53 Applications of Listed CATV Cables. CATV cables shall comply with the requirements of 820.53(A) through (D) or where cable substitutions are made as shown in Table 820.53.

(A) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type CATVD or CATVP. Abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.

Renumber the remaining subparagraphs as follows:
"B" to "C", "C" to "D"; "D" to "E".

INSERT TABLE 820.53 HERE

(Table shown on page 2771)

Revise Figure 800.53 as shown:

INSERT FIGURE 800.53 HERE

Substantiation:

The Technical Committee on Air-Conditioning and its standard, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces.

During the development cycle for the 2002 edition of NFPA 90A, The Technical Committee on Air-Conditioning submitted a series of proposals for the 2005 NEC to correlate the NEC with the 1999 edition of NFPA 90A. Now that the 2002 edition of NFPA 90A has been finalized, additional proposals are needed to correlate the NEC with the 2002 edition of NFPA 90A.

The 2002 edition of NFPA 90A has requirements for three kinds of plenum cable:

1) Listed noncombustible cable

2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed combustible plenum cable that is the equivalent of FPLP, CMP etc. cable in the NEC

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable and thereby correlate the requirements of NFPA 70 and NFPA 90A. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"The requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus combustible plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

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

Panel Meeting Action: Reject

Panel Statement:

The NEC Technical Correlating Committee in its action on comment 16-98 for the 2002 NEC overturned Code-Making Panel 16's acceptance of proposals to establish listing requirements for limited combustible cable "because the Panel's action contains no requirements or specifications for the use of limited combustible cable versus the general cables already specified." "...The Technical Correlating Committee notes that it is inappropriate to attempt to include references to all products that do not have a need for specific application rules or products that are permitted but not required by the NEC." This proposal does not contain a requirement for the use of duct cable.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-172 Log #1066 NEC-P16 **Final Action: Accept in Principle**
(820-51, Table 820.50, 820.53, Table 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Hong Chen, OFS

Recommendation:

Revise 820.51 as shown below:
820.51 Additional Listing Requirements.
Cables shall be listed in accordance with 820.51(A) through (~~D~~E).
(A) Type CATVD. Type CATVD community antenna television duct cable shall be listed as being suitable for use in air ducts and shall also be listed as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.
FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for materials installed in ducts and plenums.
(~~A~~B) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ~~ducts~~, ceiling cavity and raised floor plenums, ~~and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.
FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test. This test method and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System for installation in ceiling cavity plenums and raised floor plenums.
Renumber the remaining subparagraphs as follows:
"B" to "C", "C" to "D", "D" to "E".
Revise Table 820.50 as shown below:

Insert Table 820.50 Here

(Table shown on page 2769)

Revise Section 820.53, Table 820.53, and Figure 820.53 as shown below:
820.53 Applications of Listed CATV Cables.
CATV cables shall comply with the requirements of 820.53(A) through (~~D~~E) or where cable substitutions are made as shown in Table 820.53.
(A) Air Ducts. Cables installed in air ducts shall be Type CATVD. Abandoned cables shall not be permitted to remain. Types CATVP, CATVR, CATV, and CATV cables installed in compliance with 300.22 shall be permitted.
(~~A~~B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts~~, ceiling cavity plenums and raised floor plenums, ~~and other spaces used for environmental air~~ shall be Type CATVD or CATVP. Abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.
Renumber the remaining subparagraphs as follows:
"B" to "C"; "C" to "D"; "D" to "E".
Revise Table 820.53 as follows:

Insert Table 820.53 Here

(Table shown on page 2769)

Revise Figure 800.53 as shown below:

Insert Figure 820.53 Here

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, has made a series of proposals to correlate NFPA 70, National Electrical Code with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilation Systems. One of the issues addressed in their proposals is that NEC section 820.53 and similar sections in Articles 725, 770, 800, and 830, permit plenum (CATVP, FPLP, CMP, etc.) cable to be installed in "ducts, plenums and other space used for environmental air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.
Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CATVP, FPLP, CMP, etc.), to ceiling cavity and raised floor plenums, leads one to ask "Are these applications where it is necessary to put cables inside of ducts?" The answer is "Yes, it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (CATVP, FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A?
In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has three kinds of plenum cable:
1) Listed noncombustible cable
2) Listed limited combustible cable that has a maximum smoke developed index of 50
3) Listed plenum cable that is the equivalent of CATVP, FPLP, CMP etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and, 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in a duct. Cables meeting the requirements of supplementary material could be used but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:
"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not by qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.) because it has superior fire properties.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Two paragraphs from the substantiation to the proposals from the Air-Conditiioning Committee are shown below:

"The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action in Proposal 16-177. See panel statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.
Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-176 Log #1442 NEC-P16 **Final Action: Accept in Principle**
(820-51, Table 820.50, 820.53, Table 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Dan Kennefick, Ber-Tek a Nexans Company

Recommendation:

Revise 820.51 as shown below:

820.51 Additional Listing Requirements. Cables shall be listed in accordance with 820.51(A) through (~~D~~ E).

(A) Type CATVD. Type CATVD community antenna television duct cable shall be listed as being suitable for use in air ducts and shall also be lsited as a limited fire hazard cable having a low potential heat value, low flame spread characteristics, and very low smoke-producing characteristics.

FPN: One method of defining a low potential heat cable is establishing an acceptable value of potential heat when tested in accordance with NFPA 259, Standard Test Method for Potential Heat of Building Materials, to a maximum potential heat value not exceeding 8141 kJ/kg (3500 BTU/lb). One method of defining low flame spread cable is establishing an acceptable value of flame spread when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to a maximum flame spread index of 25. Similarly, one method of defining very low smoke-producing cable is establishing an acceptable value when tested in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials, to maximum smoke developed index of 50. These test methods and resultant values correlate with the requirements of NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating System, for materials installed in ducts and plenums.

(~~A~~ B) Type CATVP. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ~~ducts,~~ ceiling cavity plenums and raised floor plenums~~, and other spaces used for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested n accordance with NFPA 262, 1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

For a definition of "adequate fire-resistant and low smoke-producing characteristics" refer to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which through its listing requirements for plenum cables, effectively defines cables having "adequate fire-resistant characteristics" as cables having a maximum flame spread distance of 5 ft (1.5 m) or less when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces. Likewise, it effectively defines cables having "low smoke-producing characteristics" as cables having a maximum peak optical density of 0.5 or less and an average optical density of 0.15 or less in the NFPA 262 test.

Renumber the remaining subparagraphs as follows:
"B" to "C", "C" to "D", "D" to "E"

Revise Table 820.50 as shown below:

INSERT TABLE 820.50 HERE

(Table shown on page 2771)

FPN No. 1: Cable types are listed in descending order of fire-resistance rating.
FPN No. 2: See the referenced sections for listing requirements and permitted uses.

Revise Section 820.53, Table 820.53, and Figure 820.53 as shown below.

820.53 Applications of Listed CATV Cables. CATV cables shall comply with the requirements of 820.53(A) through (~~D~~ E) or where cable substitutions are made as shown in Table 820.53.

(A) Air Ducts. Cables installed in air ducts shall be Type CATVD. Abandoned cables shall not be permitted to remain. Types CATVP, CATVR, CATV, and CATV cables installed in compliance with 300.22 shall be permitted.

(~~A~~ B) Ceiling Cavity Plenums and Raised Floor Plenums. Cables installed in ~~ducts,~~ ceiling cavity plenums and raised floor plenums~~, and other spaces used for environmental air~~ shall be Type CATVD or CATVP. Abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.

Renumber the remaining subparagraphs as follows:
"B" to "C", "C" to "D", "D" to "E"

Revise Table 760.61 as shown below:

INSERT TABLE 820.53 HERE

(Table shown on page 2771)

:

INSERT FIGURE 800.53 HERE
Figure 800.53 Cable Substitution Hierarchy

Substantiation:

The Technical Committee on Air-Conditioning, which has primary responsibility for fire protection in ducts and plenums, had made a series of proposals to correlate NFPA 70, National Electrical Code, with NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems. One of the issues addressed in their proposals is that NEC section 820.53 and similar sections in Articles 725, 770, 800, and 830, permit plenum (CATVP, FPLP, CMP, etc.), cable to be installed in "ducts, plenums and other space used for environment air", while NFPA 90A restricts these cables to ceiling cavity plenums and raised floor plenums only.

Accepting the proposals from the Air-Conditioning committee to restrict plenum cable (CATVP, FPLP, CMP, etc.), to ceiling cavity and

raised floor plenums, leads one to ask, "Are there applications where it is necessary to put cables inside of ducts?" The answer is "Yes, as it is necessary to place cables inside of ducts for various sensing and control applications. That then leads to the next question, "If not plenum cable (CATVP, FPLP, CMP, etc.), what kind of cable would meet the requirements of NFPA 90A? In order to answer that question we need to review some of the requirements of NFPA 90A.

NFPA 90A has requirements for three kinds of plenum cable:

(1) Listed noncombustible cable

(2) Listed limited combustible cable that has a maximum smoke developed index of 50

(3) Listed combustible plenum cable that is the equivalent of CATVP, FPLP, CMP, etc., cable in the NEC.

For cable to be classified as limited combustible it must have a maximum potential heat of 8141 J/g (3500 BTU/lb) and a flame spread index of 25 maximum. Hence listed limited combustible cable has three requirements, 1) a maximum potential heat, 2) a maximum flame spread index and 3) a maximum smoke developed index.

NFPA 90A requires that supplementary materials for air distribution systems have a maximum flame spread index of 25 and a maximum smoke developed index of 50.

Obviously, there are two solutions to the question of what kind of cable would be suitable for use in an air duct. Cables meeting the requirements of supplementary material could be used in an air duct but they could not be used in ceiling cavity plenums and raised floor plenums. Limited combustible cables could be used because they meet all the requirements for supplementary materials while also meeting the requirements for use in ceiling cavity and raised floor plenums.

This proposal will establish "limited fire hazard cable" that meets the requirements for limited combustible cable. The term limited combustible is not used in the proposed text because the Standards Council, in a recent ruling, decided the term should not be used for cables. Rather the Standards Council directed that:

"the requirements of those items shall be designated by their fire performance characteristics (e.g., flame spread; heat release rates, smoke properties) or in terms of the appropriate test method, and not be qualitative descriptors such as "limited combustible."

This proposal complies with the Standards Council directive by designating potential heat, flame spread index and smoke developed index for limited fire hazard duct cable.

In summary, this proposal establishes limited fire hazard duct cable for used in air ducts in applications associated with the duct. It also permits duct cable to substitute for current plenum cable (FPLP, CMP, etc.), because it has superior fire properties.

An editorial change in the fine print note for testing requirements for current plenum cable was included. The wording is identical to the wording proposed by the Air-Conditioning Committee in one of its proposals.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation. Also see my presentation from the BICSI 2002 Spring Conference.

Two paragraphs from the substantiation to the proposal from the Air-Conditioning Committee are shown below:

""The Technical Committee on Air Conditioning has reviewed the NEC with respect to wiring and cable methods used in ducts and plenums that move environmental air. The Technical Committee on Air Conditioning has been assigned the primary jurisdiction for the limitations of combustible materials used in air ducts and plenum spaces. This includes wire and cable, as well as nonmetallic raceway. This proposal is one of a series of proposals that are intended to better correlate the requirements in the NEC with NFPA 90A."

"The current (1999) edition of NFPA 90A does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity and raised floor plenums. The Air Conditioning Committee has completed processing proposals and comments for the 2002 edition; it also does not address the installation of wire and cable in air ducts and plenums other than ceiling cavity plenums and raised floor plenums. The Air Conditioning Committee will need to address the issue in the next revision cycle. The use of wire, cable and nonmetallic raceway in air ducts should be allowed on a very limited basis."

The 2002 edition of NFPA 90A was issued in September of 2002. The revision cycle for NFPA 90A is about one year behind the revision schedule for the National Electrical Code. All proposals for the 2005 NEC dealing with wiring in ducts and plenums will be sent to the Technical Committee on Air-Conditioning for comment. Given their primary responsibility for "limitations of combustible materials used in air ducts and plenum spaces" their input will be very important in the processing of any proposal addressing wiring in ducts and plenums. Simply accepting the Air-Conditioning Committee's proposals to ban combustible plenum cables (FPLP, CMP, etc.), from air ducts would create a hardship because of the need for limited wiring (associated with the function of the duct) in ducts. This proposal addresses the issue and anticipates input from the Air-Conditioning Committee. If the proposal is passed by the code panel with the concurrence of the Air-Conditioning Committee, then similar proposals could be made for the next edition (2005) of NFPA 90A.

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

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables

are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-182 Log #2362 NEC-P16 **Final Action: Accept in Principle**

(820-51, Table 820.50, 820.53, Table 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: J. R. Craig, ComNet

Recommendation:

Revise 820.51 as shown below:

[Text of Proposal 16-115 recommendation is shown on page 2577]

Substantiation:

[Text of Proposal 16-182 substantiation is shown on page 2578]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-185 Log #1734 NEC-P16 **Final Action: Accept in Principle**
(820-51(A), FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

~~FPN: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle

Panel Statement:

The submitter's intent was satisfied by Proposal 16-128. The panel recognizes that the Technical Committee on Air-Conditioning has primary responsibility for combustibles in plenum spaces. Without compelling reason, the panel generally would accept a proposal from the air-conditioning committee rather than another source. The Panel accepts the recommended Fine Print Note wording from the Air Conditioning Committee (Proposal 16-128) and accepts this similar proposal "in principle" because the panel has no compelling reason to alter wording proposed by the air conditioning committee and the submitter has not provided sufficient substantiation to deviate from the wording proposed by the air conditioning committee.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment. If the Air Conditioning Committee prefers the wording in this proposal, it can indicate its preference in a comment for consideration at the ROC meeting in December.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-186 Log #68c NEC-P16 (820-52) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber sections 770.52; 800.52; 820.52 and 830.58 to be 770.55; 800.55; 820.55 and 830.55, respectively.
Renumber the reference to 800.52(D) in 725.61(C) to 800.55(D).
In the first sentence of 800.52 (new 800.55), change "800.52(A)" to "800.55(A)".
In the first sentence of 830.58 (new 830.55), change "830.58(A)" to "830.55(A)".
In 830.58(C) (new 830.55(C)), change "Table 830.58" to "Table 830.55" three times.

Substantiation:

This change lines up Section 725.55 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium Power Network-Powered Broadband Communications Cables, Section 760.55 Separation from Electric Light, Power, Class 1, NPLFA, and Medium Power Network-Powered Broadband Communications Circuit Conductors, Section 770.52 Installation of Optical Fibers and Electrical Conductors, Section 800.52 Installation of Communications Wires, cables, and Equipment, Section 820.52 Installation of Cables and Equipment and Section 830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods. These sections apply to similar requirements. With this change, all these sections will have the section number xxx.55.

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-188 Log #1761 NEC-P16 (820-52) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

820.52 Installation of Cables and Equipment.

Beyond the point of grounding, as defined in 820.33, the cable installation shall comply with 820.33(A) through (D).

(A) to stay unchanged

(B) Equipment in ~~Other Space Used for Environmental Air~~ Plenums, Including Ceiling Cavity Plenums and Raised Floor Plenums . Section 300.22 (C) shall apply.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-188 substantiation is shown on page 2586]

Panel Meeting Action: Reject

Panel Statement:

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of equipment in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of the use of equipment would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-189 Log #3513 NEC-P16 **Final Action: Accept**
(820-52)

Submitter: Leif O. Pihl Minneapolis, MN

Recommendation:

Revise as follows:
"...as defined in 820.33, the cable installation shall comply with 820.33(A) ~~through (D)~~ and (B).

Substantiation:

As of the January 18th, 2002 Errata to the NEC, there are no such sections as 820.33(C) or 820.33(D).

Panel Meeting Action: Accept

Panel Statement:

820.52 becomes new 820.55.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-187 Log #81 NEC-P16 **Final Action: Accept**
(820-52 and 820.55 (new))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

In Section 820.52 (new 820.55):
Delete section (B) "Equipment in Other Space Used for Environmental Air."
Renumber (C) to (B) and (D) to (C).
In Section 820.53(B) FPN (new 820.61(B) FPN), change "820.52(A)" to "820.3(A)".

Substantiation:

Section 820.52 is redundant. The same requirement is in Section 820.3(B). A separate proposal changes the numbering of 820.52 to 820.55.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-154.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-190 Log #1294 NEC-P16 **Final Action: Accept**
(820-52(A)(1)(b) Exception No. 1)

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(b) Electric Light, Power, Class 1, Non–Power-Limited Fire Alarm, and Medium Power Network-Powered Broadband Communications Circuits. Coaxial cable shall not be placed in any raceway, compartment, outlet box, junction box, or other enclosures with conductors of electric light, power, Class 1, non–power-limited fire alarm, or medium power network-powered broadband communications circuits.
Exception No. 1: Where all of the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium power network-powered broadband communications circuits are separated from all of the coaxial cables by a permanent barrier or listed divider.

Substantiation:

This proposal defines that the barrier is a permanent function of the enclosure or that a removable or field installed divider that has been listed may be used to divide the coaxial cables from the power circuits.

Panel Meeting Action: Accept

Panel Statement:

820.52 becomes new 820.55.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-191 Log #3510 NEC-P16 **Final Action: Reject**
(820-52(A)(2), FPN (New))

Submitter: Leif O. Pihl Minneapolis, MN

Recommendation:

Add a Fine Print Note to 820.52(A)(2) to read as follows:
FPN; See also Sections 300.3(C)(1), 800.12(B) and 830.58(A)(2) for cable separation requirements.

Substantiation:

Electricians are often unaware of the different clearances that communication, coax and data cables need, both from each other and from AC power conductors. Electricians need this information when laying out the conduit runs. If the separation requirements are noticed late in the installation, lst minute changes to conduit runs need to be made. I have noticed, upon more occasions than I can count, that when these clearances are pointed out late in the process that they are usually either ignored or resolved in a haphazard method that does not allow for proper conduit and/or cable support. Adding these cross-references will increase the chance that they will be are of, and pay attention to these clearances earlier in the installation process.

This proposal, along with the other three (see below), will help safety by reducing these late changes where support distances, securing, and other requirements could then be overlooked or ignored.

Note: Similar proposed changes have been submitted for Sections 300.3(C)(1)FPN, 800.12(B)FPN, 820.52(A)(2)FPN and 830.58(2)FPN. These four proposals work together.

Panel Meeting Action: Reject

Panel Statement:

Separation requirements are adequately covered in 820.10(F), 820.11, and 820.52(A)(1) and (2). Reference to 300.3(C)(1) is inappropriate as Chapter 8 stands alone (see 90.3) and the Chapter 8 rules are more stringent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-193 Log #2901 NEC-P16 **Final Action: Reject**
(820-52(A)(3))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add 820.52(A)(3) to read as follows:
820.52(A)(3) Type ITC Cable. Jacketed coaxial cables shall be permitted in the same raceway, enclosure, or cable tray with Type ITC Cable in accordance with Article 727.

Substantiation:

The current requirements of 820.52(A)(1) and 820.52(A)(2) are very confusing as well as overly restrictive. Type ITC cable has been permitted as an alternate wiring method for three Code cycles and industrial users have gained experience with ITC. This proposal gives industrial establishments flexibility to take fuller advantage of alternate wiring methods and allow additional intermixing of cables of similar energy levels without compromising practical safeguarding. This proposal also introduces cable tray as a recognized wiring method to this section. Companion proposals have been made for 800.52 and 830.58.

Panel Meeting Action: Reject

Panel Statement:

Mixing a power limited circuit cable with a non-power limited circuit cable is not permitted. ITC is not a power limited cable.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

HUGHES: The panel action makes the assumption Type ITC cable will always contain non-power limiting circuits. Article 727 does not prohibit power limited circuits to be contained in Type ITC cable, therefore, the panel statement to reject only addresses certain applications but not all applications of Type ITC.

16-197 Log #176 NEC-P16 **Final Action: Accept in Principle in Part**
(Table 820-53)

TCC Action:

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. This action will be considered by the Panel as a Public Comment.

Submitter: Steven C. Johnson, Time Warner Cable

Recommendation:

Revise Table 820.53 as follows:

Include NECL176-Tbl 820.53*

Substantiation:

820.3 (G) allows Article 830 wiring methods for Article 820 applications. Article 830 cable types are being added to the cable substitution chart to reflect this allowance.

"820.3 Locations and Other Articles. (G) Alternate Wiring Methods. The wiring methods of Article 830 shall be permitted to substitute for the wiring methods of Article 820.

FPN: Use of Article 830 wiring methods will facilitate the upgrading of Article 820 installations to networkpowered broadband applications."

Panel Meeting Action: Accept in Principle in Part

The concept of the revised Table is in 16-211a (Log #CP1605). In 16-211a (Log #CP1605), medium power cables are not permitted to be substituted for CATV cables because of the additional limitations on the use of medium power cables. The table was further simplified; refer to Proposal 16-177.

Panel Statement:

The action taken on 16-211a (Log #CP1605) addresses the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-194 Log #1295 NEC-P16 (820-53) **Final Action: Accept in Principle**

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:

820.53 Applications of Listed CATV Cables.

CATV cables shall comply with the requirements of 820.53(A) through (D) or where cable substitutions are made as shown in Table 820.53.

<Table 820.53>

(A) Plenum. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type CATVP. Abandoned cables shall not be permitted to remain. Types CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted. Listed plenum coaxial raceways shall be permitted to be installed in ducts and plenums as described in 300.22(B) and in other spaces used for environmental air as described in 300.22(C). Only Type CATVP cable shall be permitted to be installed in these raceways.

(B) Riser. Cables installed in risers shall comply with any of the requirements of 820.53(B)(1) through (B)(3).

(1) Cables in Vertical Runs. Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type CATVR. Floor penetrations requiring Type CATVR shall contain only cables suitable for riser or plenum use. Abandoned cables shall not be permitted to remain. Listed riser coaxial raceways shall be permitted to be installed in vertical riser runs in a shaft from floor to floor. Only Type CATVR and CATVP cables shall be permitted to be installed in these raceways.

(2) Metal Raceways or Fireproof Shafts. Types CATV and CATVX cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

<Figure 820.53>

(3) One- and Two-Family Dwellings. Types CATV and CATVX cables shall be permitted in one- and two-family dwellings.

FPN: See 820.53(A) for the firestop requirements for floor penetrations.

(C) Cable Trays. Cables installed in cable trays shall be Types CATVP, CATVR, and CATV.

(D) Other Wiring Within Buildings. Cables installed in building locations other than the locations covered in 820.53(A) and (B) shall be with any of the requirements in 820.53(D)(1) through (5). Abandoned cables in hollow spaces shall not be permitted to remain.

(1) General. Type CATV shall be permitted. Listed coaxial general-purpose raceways shall be permitted. Only Types CATV, CATVX, CATVR or CATVP cables shall be permitted to be installed in general-purpose communications raceways.

(2) In Raceways. Type CATVX shall be permitted to be installed in a raceway.

(3) Nonconcealed Spaces. Type CATVX shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).

(4) One- and Two-Family Dwellings. Type CATVX cables less than 10 mm (0.375 in.) in diameter shall be permitted to be installed in one- and two-family dwellings.

(5) Multifamily Dwellings. Type CATVX cables less than 10 mm (0.375 in.) in diameter shall be permitted to be installed in multifamily dwellings.

Substantiation:

This is the third of three companion proposals to add Nonmetallic Coaxial Raceways to Article 820. The same listed raceways are currently found in Articles 770 and 800 for Optical Fiber and Communication Cables. These raceways are commonly being used for the removal of abandon cables and are ideal for coaxial cables.

Panel Meeting Action: Accept in Principle

Delete in sections A, B(1) and D of 820.53, "Abandoned cables ... shall not be permitted to remain." Delete "CATVX" in D(1) to correlate with a similar provision in 800.53(E)(1). Change (D)(2) in the proposal to read as follows: "In Raceways. Type CATVX shall be permitted to be installed in raceways as permitted in Chapter 3."

In paragraph (A), replace the fourth sentence with "Listed plenum CATV raceways shall be permitted to be installed in ceiling cavity plenums and raised floor plenums."

In each place in the proposal that refers to "coaxial raceways", change to "CATV raceways."

Panel Statement:

Refer to Proposal 16-141 which removes the sentence "Abandoned cable shall not be permitted to remain." The provisions for the use of fiber optic and communications raceway permit cables of equal or higher fire rating in the raceway. Type CATVX cannot be used. The change that is made is consistent with 800.53(D)(2).

The change in uses of raceways correlates with CP1606 and CP1607.

The use of the term "coaxial raceways" was deleted because it could literally mean a raceway within a raceway.

820.53 becomes new 820.61.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-141 (Log #191).

16-195 Log #1762 NEC-P16 (820-53) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International

Recommendation:

820.53 Applications of Listed CATV Cables.
CATV cables shall comply with the requirements of 820.53(A) through (D) or where cable substitutions are made as shown in Table 820.53.

(A) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) . Cables shall be installed in ducts, plenums, and other spaces used for environmental air plenums, including ceiling cavity plenums and raised floor plenums, in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type CATVP. The accessible portion of abandoned CATV coaxial Abandoned cables shall not be permitted to remain. Types CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.

(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-195 substantiation is shown on page 2595]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of Types OFNP, OFCP, CMP, MPP and CATVP cables in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.

The portion of the proposal that deals with cables being removed was addressed in proposal 16-141.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-198 Log #2777 NEC-P16 **Final Action: Accept in Principle in Part**
(Table 820-53)

TCC Action:

The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal. This action will be considered by the Panel as a Public Comment.

Submitter: Timothy D. Cooke, Times Fiber Communications, Inc.

Recommendation:

Revise Table 820.53, Coaxial Cable Uses and Permitted Substitutions, to include cables approved for use and listed per 830. Network Powered Broadband Communications Cables. Table to be amended to reflect the following:
CATVP - add BLP cable type, CATVR - add BLP and BMR cable types, CATV - add BLP, BMR, BLX, and BM cable types. CATVX - add BLP, BMR, BLX, and BM cable types.

Insert Table 820.53 (current and proposed) Here

(Table shown on page 2773)

Substantiation:

Presently, the cables which are tested and approved for use per NEC 2002, 830.5 are not recognized as permitted substitutions for CATV installations per NEC 2002, 820.53, Table 53. Cables which have been tested and listed per 830, have met and exceed the requirements for NEC 2002, 800, Communications Cables and 820, Community Antenna Television and Radio Distribution Systems, in addition to more extensive tests. With the inclusion of the 830 cable types as permitted substitutions for 820 cable types, cable manufacturers and operators have more flexibility with product offerings and inventory management, while ensuring that the safety requirements are maintained for CATV installations.

Panel Meeting Action: Accept in Principle in Part

The concept of the revised Table is in 16-211a (Log #CP1605). In 16-211a (Log #CP1605), medium power cables are not permitted to be substituted for CATV cables because of the additional limitations on the use of medium power cables. The table was further simplified; refer to Proposal 16-177. Type BLX cannot be used as a sustitutation for Type CATV cable as Type BLX has a lower fire rating.

Panel Statement:

The action taken on 16-211a (Log #CP1605) addresses the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-196 Log #2578 NEC-P16 **Final Action: Accept in Principle**
(820-53, Figure 820.53, and Table 820.53)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise Sections 820.53(A), and (C), Table 820.53, and Figure 820.53 as shown. The other Sections do not change.

820.53 Applications of Listed CATV Cables. CATV cables shall comply with the requirements of 820.53(A) through (D) or where cable substitutions are made as shown in Table 820.53.

(A) Air Ducts and Plenums. Cables installed in air ducts and plenums shall comply with the applicable requirements of (1) or (2) below.

(1) Air Ducts. Cables installed in air ducts shall be Type CATVD and shall be associated with the air duct system. Listed wire and cables installed in compliance with Section 300.22 shall be permitted.

(2) Plenums. Cables installed in plenums shall comply with (a) or (b) below.

(a) Cables installed in plenums, other than ceiling cavity plenums and raised floor plenums, shall be Type CATVD and shall be associated with the plenum system. Where installed in an air-handling unit room plenum, Type CATVD cable shall be mechanically protected to a height of 7 feet above the floor. Listed coaxial cables installed in compliance with Section 300.22 shall be permitted.

(b)~~(A) Plenum.~~ Cables installed in ceiling cavity plenums and raised floor plenums ~~ducts, plenums, and other spaces used for environmental air~~ shall be Type CATVD or Type CATVP. Abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cables installed in compliance with 300.22 shall be permitted.

~~FPN: Plenums described in NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, include air-handling unit room plenums, apparatus casing plenums, duct distribution plenums, ceiling cavity plenums, and raised floor plenums.~~

(C) Cable Trays. Cables installed in cable trays shall be Types CATVD, CATVP, CATVR, and CATV.

Revise Table 820.53 as shown:

INSERT Table 820.53 HERE

(Table shown on page 2772)

Revise Figure 820.53 Cable Substitution Hierarchy as shown.

INSERT Figure 820.53 HERE

Substantiation:

[Text of Proposal 16-196 substantiation is shown on page 2604]

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-199 Log #2091 NEC-P16 (820-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Sanford Egesdal, Egesdal Associates PLC

Recommendation:

Revise text to read as follows:

820.53(A) Ceiling cavity and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type CATVD or Type CATVP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CATVD. The accessible portion of abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cable installed in compliance with 300.22 shall be permitted.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type CATVD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type CATVP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean roomS, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-200 Log #2092 NEC-P16 (820-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Stanley Kaufman, CableSafe, Inc.

Recommendation:

Revise text to read as follows:

820.53(A) Ceiling cavity and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type CATVD or Type CATVP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CATVD. The accessible portion of abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cable installed in compliance with 300.22 shall be permitted.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type CATVD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type CATVP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-201 Log #2093 NEC-P16 (820-53(A)) **Final Action: Accept in Principle**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Frank Peri, Communications Design Corporation

Recommendation:

Revise text to read as follows:

820.53(A) Ceiling cavity and raised floor plenums. Cables installed in accessible ceiling cavity plenums and accessible raised floor plenums shall be Type CATVD or Type CATVP. Cables installed in inaccessible ceiling cavity plenums and inaccessible raised floor plenums shall be Type CATVD. The accessible portion of abandoned cables shall not be permitted to remain. Types CATVD, CATVP, CATVR, CATV, and CATVX cable installed in compliance with 300.22 shall be permitted.

Substantiation:

CMP 16 addressed the issue of the increasing amounts of combustible cables in plenums by adopting requirements that the accessible portion of abandoned cables must be removed. But what about cables in inaccessible plenums? Since it is not feasible to remove them, requiring a cable with a lower potential fuel load, lower smoke emissions and a higher level of fire resistance is a sensible approach. Type CATVD, limited fire hazard cables have significantly lower fuel load and lower smoke production than conventional Type CATVP plenum cables.

A few examples of inaccessible plenums are:

1. Above ceiling plenum area that has been sheet rocked over. This is typical for doctors' offices, clean rooms, laboratories, strip malls etc.
2. Above ceiling plenum area that has been closed with "lock tile" (interlocking tiles). Usually one access point is provided but the entire ceiling would have to be taken apart to access cable and other equipment.

For further information of the fire performance of limited fire hazard cables (limited combustible cables) versus conventional plenum cables see, the report "International Limited Combustible Plenum Cable Fire Test Project" published by the Fire Protection Research Foundation.

Listing and marking requirements for limited fire hazard cables are covered in another proposal.

Panel Meeting Action: Accept in Principle

Panel Statement:

See panel action and statement in Proposal 16-177.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 3

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements or specifications in 300.22 for the use of air-duct "D" cables (OFND, OFCD, CMD, MPD) versus the communications cables already specified. In its action on comment 16-98 for the 2002 NEC, the Technical Correlating Committee noted that it is inappropriate to attempt to include references to all products that do not have a need or specific application rules or products that are permitted but not required by the NEC. Hence supporting the inclusion of air-duct cable is in violation of specific ruling given by the TCC on this very similar (same cable requirements but with a new name) issue during the last Code cycle.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

Comment on Affirmative:

DORNA: See my comment on Proposal 16-37.

16-202 Log #869 NEC-P16 (820-53(B)(1)) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that it is Proposal 16-194 that accomplishes the Submitter's intent.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise last sentence of 820.53 (B)(1) as follows:
The accessible portion of ~~A~~abandoned cables shall not be permitted to remain.

Substantiation:

Correlates with 820.3 (A) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 820.53 (D), 830.55 (B), 830.55 (C) (1), 725.61 (A), 725.61 (B) (1).

Panel Meeting Action: Accept in Principle

Panel Statement:

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain." Proposal 16-75 accomplished the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

16-203 Log #870 NEC-P16 (820-53(D)) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that it is Proposal 16-194 that accomplishes the Submitter's intent.

Submitter: James E. Brunssen, Telcordia Technologies, Inc.

Recommendation:

Revise last sentence of 820.53 (D) as follows:
The accessible portion of ~~A~~abandoned cables in hollow spaces shall not be permitted to remain.

Substantiation:

Correlates with 820.3 (A) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 820.53 (B)(1), 830.55 (B), 830.55 (C) (1), 725.61 (A), 725.61 (B) (1).

Panel Meeting Action: Accept in Principle

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain."

Panel Statement:

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain." Proposal 16-75 accomplished the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-177 (Log #1666).

16-204 Log #1296 NEC-P16 **Final Action: Reject**
(820-54 (New))

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add new text text to read as follows:
820.54 Coaxial Device and Equipment Mounting. Coaxial devices or equipment shall be mounted in listed boxes or assemblies designed for the purpose, and such boxes or assemblies shall be securely fastened in place. Boxes can either be completly enclosed or backless.
(A) Coaxial Devices and Equipment Mounted in Boxes. Coaxial devices or equipment shall be mounted in listed boxes and installed per 314.20.
(B) Coaxial Devices and Equipment Mounted on Covers. Coaxial device and equipment mounted to and supported by a cover shall be held rigidly against the cover which is mounted to the box.
(C) Wet Locations. Coaxial devices and equipment installed in a wet location shall use a cover that is listed for a wet location whether or not the device is in use.
FPN: See Article 100 for the definition of a "Wet Location".

Substantiation:

This proposals adds a new section to Article 820 addressing the mounting of devices or equipment to listed boxes.. Currently, depending on the quality of workmanship, coaxial devices or equipment have not been mounted to boxes that can support them. After several years device and/or covers that are mounted directly to the dry wall will become hazard because they have become loose and exposed. Coaxial devices used in a wet location, as defined in Article 100, shall have the connection protected from the elements by an in-use weatherproof cover.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided no data supporting an existing hazard. The submitter offers only an individual opinion that, depending on the quality of workmanship, equipment or devices mounted directly to a dry wall may, over time, loosen and become a hazard. The addition of listed boxes or assemblies will not, in itself, guarantee a hazard-free installation. The same quality of workmanship is necessary to help ensure a hazard-free equipment installation whether listed boxes are used or not.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-192 Log #2899 NEC-P16 **Final Action: Reject**
(820-58(A)(3))

Submitter: Dorothy Kellogg, American Chemistry Council

Recommendation:

Add 830.58(A)(3) to read as follows:
830.58(A)(3) Type ITC Cable. Low and medium power network-powered broadband communications cables shall be permitted in the same raceway, enclosure, or cable tray with Type ITC Cable in accordance with Article 727.

Substantiation:

The current requirements of 830.58(A)(1) and 830.58(A)(2) are very confusing as well as overly restrictive. Type ITC cable has been permitted as an alternate wiring method for three Code Cycles and industrial users have gained experience with ITC. This proposal gives industrial establishments flexibility to take fuller advantage of alternate wiring methods and allow additional intermixing of cables of similar energy levels without compromising practical safeguarding. This proposal also introduces cable tray as a recognized wiring method to this section. Companion proposals have been made for 800.52 and 820.52.

Panel Meeting Action: Reject

Panel Statement:

Mixing a power limited circuit cable with a non-power limited circuit cable is not permitted. ITC is not a power limited cable.
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

HUGHES: The panel action makes the assumption Type ITC cable will always contain non-power limiting circuits. Article 727 does not prohibit power limited circuits to be contained in Type ITC cable, therefore, the panel statement to reject only addresses certain applications but not all applications of Type ITC.

16-205 Log #126 NEC-P16 (830) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that the action on this proposal is modified by Proposals 16-13, 16-15, 16-21, 16-28, 16-46, 16-56, 16-64, 16-97a, 16-100, 16-128, 16-141, 16-161, 16-210, 16-211a, 16-211a, 16-216, 16-219, 16-220, 16-221, 16-222, 16-224, and 16-226.

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber the sections within Articles 725, 760, 770, 800, 820 & 830 as shown on the following table. For information, the following are pro forma rewrites of the Articles assuming that the individual proposals are accepted.

[Recommendation of Proposal 16-205 is shown on page 2607]

Insert Table Here

Insert Table 830.4 Here

Insert Table 830.12 Here

Insert Table 830.55 Here

(Tables shown on page 2774)

Substantiation:

Section 2.4.1 of the 2001 National Electrical Code Style Manual states:
2.4.1 Parallel Numbering Within Similar Articles. To the extent possible, Code-Making Panels are encouraged to use the same section numbers (and part numbers, where applicable) for the same purposes within articles covering similar subjects.
The CMP 16 Editorial Task Group has prepared a series of proposals such that these Articles conform with the intent of the Style Manual. The Task Group includes myself, S. Egesdal, S. Kaufman, S. Johnson, J. Brunssen, G. Dorna, D. Pirkle and M. Wierenga. Work was undertaken after consultation with the TCC chairman.

Panel Meeting Action: Accept in Principle

The panel restructured this Article as shown in the pro forma rewrite.

Panel Statement:

The panel accepts this action to comply with the NEC Style Manual, Section 2.4.1.
See actions on Proposals 16-206, 16-212, 16-214, 16-232, 16-100, 16-217, 16-218, 16-233, 16-227, 16-208, 16-161.
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-206 Log #61d NEC-P16 (830-3) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete "Locations and" from the title of these sections to make the section titles "Other Articles."

Substantiation:

The current titles are not in agreement with the 2001 National Electrical Code Style Manual sections 2.5 and 3.3.5.
In the 2002 NEC, the following sections all have the title "Other Articles": 225.2; 372.3; 402.2; 445.3; 500.3; 505.3; 518.3; 545.2; 547.3; 604.3; 650.2; 668.3; 705.2 and 720.2.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-207 Log #1763 NEC-P16 (830-3) **Final Action: Reject**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

830.3 Locations and Other Articles.

Circuits and equipment shall comply with 830.3(A) through (D).

(A) Spread of Fire or Products of Combustion. Section 300.21 shall apply. The accessible portion of abandoned network-powered broadband communications cables shall not be permitted to remain.

(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22 shall apply, where installed in ducts or plenums or other air-handling spaces ~~spaces used for environmental air, shall apply~~. Type BMP and BLP cables shall be permitted for low power and medium power network-powered broadband communications systems installed in plenums, including ceiling cavity plenums and raised floor plenums. Wiring methods installed in a plenum space shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the plenum space.

Exception: As permitted in 830.55(B).

(C) Installation and Use. Section 110.3(B) shall apply.

(D) Output Circuits. As appropriate for the services provided, the output circuits derived from the network interface unit shall comply with the requirements of the following:

(1) Installations of communications circuits — Article 800

(2) Installations of community antenna television and radio distribution circuits — Article 820

Exception: 830.30(B)(3) shall apply where protection is provided in the output of the NIU.

(3) Installations of optical fiber cables — Article 770

(4) Installations of Class 2 and Class 3 circuits — Article 725

(5) Installations of power-limited fire alarm circuits — Article 760

Substantiation:

[Text of Proposal 16-207 substantiation is shown on page 2614]

Panel Meeting Action: Reject

Panel Statement:

Type BMP does not exist and the panel rejects establishment. See panel action on Proposal 16-228. See also, action on Proposal 16-12.

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-208 Log #89 NEC-P16 (830-5) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Create a new section VI "Listing Requirements" and renumber section 830.5 to be in the new section and numbered 830.82.

In Section 830.5 Exeption No. 2 (new 830.82), change "830.58" to "830.55".

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-209 Log #1764 NEC-P16 (830-5) **Final Action: Accept in Principle in Part**

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

830.5 Network-Powered Broadband Communications Equipment and Cables.

Network-powered broadband communications equipment and cables shall be listed as suitable for the purpose.

Exception No. 1: This listing requirement shall not apply to community antenna television and radio distribution system coaxial cables that were installed prior to January 1, 2000, in accordance with Article 820 and are used for low-power network-powered broadband communications circuits. See 830.9.

Exception No. 2: Substitute cables for network-powered broadband communications cables shall be permitted as shown in Table 830.58.

(A) Listing and Marking. Listing and marking of network-powered broadband communications cables shall comply with 830.5(A)(1) or (A)(2).

(1) Type BMU, Type BM, and Type BMR, and Type BMP Cables. Network-powered broadband communications medium power underground cable, Type BMU; network-powered broadband communications medium power cable, Type BM; and network-powered broadband communications medium power riser cable, Type BMR, and Type BMP network-powered broadband communications medium power plenum cable, shall be factory-assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.11. Type BMU cables shall be jacketed and listed as being suitable for outdoor underground use. Type BM cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire. Type BMR cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor. Type BMP cables shall be listed as being suitable for use in plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN No. 1: One method of defining resistant to spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords. Another method of defining resistant to the spread of fire is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-—1985, Test Methods for Electrical Wires and Cables.

FPN No. 2: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

FPN No. 3: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

(2) Type BLU, Type BLX, Type BLR, and Type BLP Cables. Network-powered broadband communications low-power underground cable, Type BLU; limited use network-powered broadband communications low-power cable, Type BLX; and network-powered broadband communications low-power plenum cable, Type BLP, shall be factory assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.11. Type BLU cables shall be jacketed and listed as being suitable for outdoor underground use. Type BLX limited-use cables shall be listed as being suitable for use outside, for use in dwellings, and for use in raceways and shall also be listed as being resistant to flame spread. Type BLR cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor. Type BLP cables shall be listed as being suitable for use in plenums, including ceiling cavity plenums and raised floor plenums, ~~ducts, plenums, and other spaces for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN No. 1: One method of determining that cable is resistant to flame spread is by testing the cable to VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

FPN No. 2: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

FPN No. 3: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

Substantiation:

Substantiation:

[Text of Proposal 16-209 substantiation is shown on page 2623]

Panel Meeting Action: Accept in Principle in Part

The panel only accepts in principle that part of the proposal that includes Type BLR cable. See 16-211a (Log #CP1605). The remainder of the proposal is rejected.

Panel Statement:

Section 830.54 requires medium power cable in plenums to be installed in metallic raceway per 300.22. This proposal does not provide any substantiation to allow medium power cable in plenums without a metallic enclosure. The panel rejects establishment of Type BMP cable.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

830.5 becomes new 830.82.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums, or raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

16-210 Log #290 NEC-P16 **Final Action: Accept**
(830-5 Exception No. 1)

Submitter: Steven C. Johnson, Time Warner Cable / Rep. National Cable Telecommunications Association

Recommendation:

Revise text to read as follows:

830.5 Network-Powered Broadband Communications Equipment and Cables.

Network-powered broadband communications equipment and cables shall be listed as suitable for the purpose.

Exception No. 1: This listing requirement shall not apply to community antenna television and radio dustribution system coaxial cables that were installed prior to January 1, 2000, in accordance with Article 820 and are used for low-power network-powered broadband communications circuits. ~~See 830.9~~.

Substantiation:

830.9 is an inappropriate reference as it details installations in hazardous locations; not low-power applications. In the 1999 NEC, 830-9 was Entrance Cables. The reference was not corrected in 2002 to reflect renumbering of the section.

Entrance cables does not appear to be the correct reference since the section deals with low-power circuits. The exception's language is clear enough without the need for a referral. The reference adds little to the clarity so this proposal is to remove it entirely.

Panel Meeting Action: Accept

Panel Statement:

830.5 becomes new 830.82.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-211 Log #1735 NEC-P16 **Final Action: Accept in Principle in Part**
(830-5(A)(1) and A (2) and FPN)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association and Vinyl Institute EOTS

Recommendation:

Revise text to read as follows:

(A) Listing and Marking. Listing and marking of network-powered broadband communications cables shall comply with 830.5(A)(1) or (A)(2).

(1) Type BMU, Type BM, ~~and~~ Type BMR, and Type BMP Cables. Network-powered broadband communications medium power underground cable, Type BMU; network-powered broadband communications medium power cable, Type BM; ~~and~~ network-powered broadband communications medium power riser cable, Type BMR, and Type BMP network-powered broadband communications medium power plenum cable, shall be factory-assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.11. Type BMU cables shall be jacketed and listed as being suitable for outdoor underground use. Type BM cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire. Type BMR cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor. Type BMP cables shall be listed as being suitable for use in plenums, including ceiling cavity plenums and raised floor plenums, and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN No. 1 and FPN No. 2: No change

FPN No. 3: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

(2) Type BLU, Type BLX, Type BLR, and Type BLP Cables. Network-powered broadband communications low-power underground cable, Type BLU; limited use network-powered broadband communications low-power cable, Type BLX; and network-powered broadband communications low-power plenum cable, Type BLP, shall be factory assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.11. Type BLU cables shall be jacketed and listed as being suitable for outdoor underground use. Type BLX limited-use cables shall be listed as being suitable for use outside, for use in dwellings, and for use in raceways and shall also be listed as being resistant to flame spread. Type BLR cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor. Type BLP cables shall be listed as being suitable for use in plenums, including ceiling cavity plenums and raised floor plenums, ~~ducts, plenums, and other spaces for environmental air~~ and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN No. 1: No change

~~FPN No. 2: One method of defining low-smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing a maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.~~

FPN No. 2: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

FPN No. 3: One method of defining cables with adequate fire-resistant and low smoke-producing characteristics is by reference to NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, which, through its listing requirements for plenum cables, establishes a maximum allowable flame travel distance of 1.52 m (5 ft), a maximum peak optical density of 0.5 and a maximum average optical density of 0.15, all when tested in accordance with NFPA 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

Substantiation:

This proposal recommends to editorially revise the listing requirements for plenum cables in the FPN by referring to NFPA 90A. NFPA 90A is the primary NFPA standard for setting these requirements. The difference between the current NEC and NFPA 90A is that the NEC uses a fine print note to suggest the requirements for plenum cable whereas in NFPA 90A they are in the standard. NFPA 90A (2002) in sections 4.3.10.2 (ceiling cavity plenum) and 4.3.10.6 (raised floor plenum) has established minimum listing requirements for cables installed in plenums.

This proposal is substantially similar in concept to that by Jeffrey Mattern, chairman of the Technical Committee on Air Conditioning, on the same Fine Print Notes. The difference between the two proposals is basically editorial. We support the Mattern proposal, but feel that the present proposal contains editorial improvements.

There are three additional issues addressed in this proposal:

(1) Establish a listing for BLP cables, namely network-powered broadband communications low-power cables suitable for plenum use, consistent with BMP cables.

(2) Establish a listing for BMR cables, namely network-powered broadband communications medium-power cables suitable for riser use, consistent with BLR cables.

(3) The additional changes in the proposal refer to the change in language associated with the language in NFPA 90A, whereby the language correctly refers to the spaces, plenums, including ceiling cavity plenums and raised floor plenums, for which plenum cables are required in NFPA 90A, with the correct terminology for the spaces. See the additional proposal on this section for a more detailed

substantiation based on the fire hazard and the fire risk in plenum spaces and other concealed spaces.

The three organizations represented in this proposal are submitting this proposal jointly as a single submission to avoid repetition at NFPA, per earlier instructions of NFPA staff. This joint submission is not intended to waive the ability of any of the groups to file separate proposals or comments in the future.

Panel Meeting Action: Accept in Principle in Part

The panel only accepts in principle that part of the proposal that includes Type BLR cable. See 16-211a (Log #CP1605). The remainder of the proposal is rejected.

Panel Statement:

Section 830.54 requires medium power cable in plenums to be installed in metallic raceway per 300.22. This proposal does not provide any substantiation to allow medium power cable in plenums without a metallic enclosure. The panel rejects establishment of Type BMP cable.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JENSEN: CMP 16 is only responsible for articles 770, 800, 820 and 830 which share the common requirement that Section 300.22 shall apply. There are no requirements, specifications, definitions, or descriptions of "ceiling cavity plenums, or raised floor plenums" that have been accepted by CMP 3 which is responsible for 300.22.

JONES: The submitter has introduced a new cable designator for a cable presently in use. This change to provide an additional cable designation is predicated on the acceptance of a subdividing of the NEC description "other spaces used for environmental air." There has been no documentation introduced for this division. Utilizing the phrases "ceiling cavity plenums" and "raised floor plenums" provides an additional subdivision of the NEC phrase "other spaces used for environmental air" resulting in a restriction of wiring methods within those areas without additional technical substantiation.

Without the technical substantiation, there is no clear, concise and precise evidence as to why additional cable type designators are necessary. No technical documentation has been provided, such as fire loss data, as to why the present plenum type cables are not suitable for use in the environmental air handling spaces where their use is presently accepted.

16-211a Log #CP1605 NEC-P16 **Final Action: Accept**
(830-5(A)(2), 830.55, Table 830.58, Table 820.53)

Submitter: Code-Making Panel 16

Recommendation:

Replace existing 830.5(A)(2) with the following:

830.5(A)(2) Type BLU, Type BLX, Type BL, Type BLR, and Type BLP Cables. Network-powered broadband communications low-power underground cable, Type BLU; limited use network-powered broadband communications low-power cable, Type BLX; network-powered broadband communications low-power cable, Type BL; network-powered broadband communications low-power riser cable, Type BLR; and network-powered broadband communications low-power plenum cable, Type BLP, shall be factory assembled cables consisting of a jacketed coaxial cable, a jacketed combination of coaxial cable and multiple individual conductors, or a jacketed combination of an optical fiber cable and multiple individual conductors. The insulation for the individual conductors shall be rated for 300 volts minimum. Cables intended for outdoor use shall be listed as suitable for the application. Cables shall be marked in accordance with 310.11. Type BLU cables shall be jacketed and listed as being suitable for outdoor underground use. Type BLX limited-use cables shall be listed as being suitable for use outside, for use in dwellings, and for use in raceways and shall also be listed as being resistant to flame spread. Type BL cables shall be listed as being suitable for general-purpose use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire. Type BLR cables shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor. Type BLP cables shall be listed as being suitable for use in ducts, plenums, and other spaces for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.

FPN No. 1: One method of determining that cable is resistant to flame spread is by testing the cable to VW-1 (vertical-wire) flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

FPN No. 2: One method of defining resistant to spread of fire is that the cables do not spread fire to the top of the tray in the vertical tray flame test in ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables and Flexible Cords.

FPN No. 3: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts.

FPN No. 4: One method of defining low smoke-producing cable is by establishing an acceptable value of the smoke produced when tested in accordance with NFPA 262-1999, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, to a maximum peak optical density of 0.5 and a maximum average optical density of 0.15. Similarly, one method of defining fire-resistant cables is by establishing maximum allowable flame travel distance of 1.52 m (5 ft) when tested in accordance with the same test.

Replace existing 830.55 with the following:

830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods.

Low-power network-powered broadband communications systems shall comply with any of the requirements of 830.55(A) through (D).

(A) In Buildings. Low-power network-powered broadband communications systems shall be installed within buildings using listed Type BLX, Type BL, Type BLR, or Type BLP network-powered broadband communications low power cables.

(B) Ducts, Plenums, and Other Air-Handling Spaces. Cables installed in ducts, plenums, and other spaces used for environmental air shall be Type BLP. Type BLR, Type BL, and Type BLX cables installed in compliance with 300.22 shall be permitted.

(C) Riser. Cables installed in risers shall comply with any of the requirements in 830.55(C)(1), (C)(2), or (C)(3).

(1) Cables in Vertical Runs. Cables installed in vertical runs and penetrating more than one floor, or cables installed in vertical runs in a shaft, shall be Type BLP, BLR, or BMR. Floor penetrations requiring Type BMR or BLR shall contain only cables suitable for riser or plenum use.

(2) Metal Raceways or Fireproof Shafts. Type BLX and Type BL cables shall be permitted to be encased in a metal raceway or located in a fireproof shaft having firestops at each floor.

(3) One- and Two-Family Dwellings. Type BLX or BL cables less than 10 mm (0.375 in.) in diameter shall be permitted in one- and two-family dwellings.

(D) Other Wiring. Cables installed in locations other than the locations covered in 830.55(A), (B), and (C) shall comply with the requirements of 830.55(D)(1) through (D)(5).

(1) General. Type BLP, BL, or BM shall be permitted.

(2) In Raceways. Type BLX shall be permitted to be installed in a raceway.

(3) Type BLU Cable. Type BLU cable entering the building from outside shall be permitted to be run in rigid metal conduit or intermediate metal conduit. Such conduits shall be grounded to an electrode in accordance with 830.40(B).

(4) One- and Two-Family Dwellings. Type BLX or BL cables less than 10 mm (0.375 in.) in diameter shall be permitted to be installed in one- and two-family dwellings.

(5) Type BLX Cable. Type BLX cable entering the building from outside and terminated at a grounding block or a primary protection location shall be permitted to be installed, provided that the length of cable within the building does not exceed 15 m (50 ft).

FPN:This provision limits the length of Type BLX cable to 15 m (50 ft), while 830.30(B) requires that the primary protector, or NIU with integral protection, be located as close as practicable to the point at which the cable enters the building. Therefore, in installations requiring a primary protector, or NIU with integral protection, Type BLX cable may not be permitted to extend 15 m (50 ft) into the building if it is practicable to place the primary protector closer than 15 m (50 ft) to the entrance point.

Replace existing Table 830.58 with the following:

Table 830.58 Cable Substitutions

Cable Type	Permitted Cable Substitutions
BM	BMR
BLP	CMP, CL3P
BLR	CMR, CL3R, BMR
BL	CMP, CL3P, CMR, CM, CL3, BLR, BM, BLP
BLX	CMP, CL3P, CMR, CL3R, CM, CL3, CMX, CL3X, BMR, BM, BLP, BLR, BL

Replace existing Table 820.53 with the following:

Table 820.53 Coaxial Cable Permitted Substitutions

Cable Type	Permitted Substitutions
CATVP	CMP, BLP
CATVR	CATVP, CMP, CMR, BLP, BLR

CATV CATVP, CMP, CATVR, CMR, CM, BLR, BLP, BL
CATVX CATVP, CMP, CATVR, CMR, CATV, CM, BLP, BLR, BL, BLX

Substantiation:

The present NEC does not make provision for low-power, general-purpose or low-power, riser-rated coaxial cables. Applications or conditions exist allowing the use of general purpose or riser-rated cables, if available. The inclusion of BL and BLR cable types will provide a more complete product offering for communications companies wanting to utilize low-power schemes within their coaxial cable plant designs. This change will allow more economical alternatives with no impact on safety.

As part of the creation of Type BL and Type BLR, the associated methods of defining the flame-resistance characteristics are needed. Type BL products are to be used for general purpose applications, similar to the present Type BM, Type CM, Type CL2, and Type CATV products, with the same level of resistance to flame spread. Type BL cables will meet the requirements of ANSI/UL 1581-1991, Reference Standard for Electrical Wires, Cables, and Flexible Cords, Vertical Tray Flame Test. Type BLR, used in vertical riser applications, shall meet the same flame-resistance criteria as Type CMR, CL2R, BMR, and CATVR products in ANSI/UL 1666-1997, Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts. These references are to be added as FPN 2 and 3 with the present FPN 2 being renumbered to FPN 4.

With the addition of BL and BLR, changes are necessary to Table 820.53, Coaxial Cable Uses and Permitted Substitutions to reflect these additions.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-212 Log #62k NEC-P16 **Final Action: Accept**
(830-6)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-213 Log #863 NEC-P16 **Final Action: Reject**
(830-6)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 830.6 as follows:

830.6 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an excess accumulation of wires and cables ~~that prevents~~ sufficient to prevent the removal of panels, including suspended ceiling panels.

Substantiation:

Section 830.6 has been misinterpreted to mean that wires and cables may not be placed directly on suspended ceilings. This was not the intent of CMP 16 when the concept was introduced into the 1993 NEC. At that time CMP 16 stated in response to a proposal to Article 725 (1992 TCD, Comment 16-18) that the proposed requirement "…. would still allow some cabling of a limited quantity above the ceiling tile, but not to an excessive amount." There is no reason that a small number of wires and cables cannot be placed there as long as they do not jeopardize the physical support of the ceiling or preclude access. The proposed change permits limited wire and cable above the ceiling to facilitate small installations and rearrangements, and emphasizes that it is an excessive accumulation of wire and cable that is of concern. This is a companion proposal and is intended to correlate with similar proposals for 640.5, 725.5, 760.5, 770.7, 800.5, and 820.5.

Panel Meeting Action: Reject

Panel Statement:

No additional clarification of the existing provision has been provided. The proposal does not change the requirement.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-214 Log #62l NEC-P16 **Final Action: Accept**
(830-7)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 725.5; 760.5; 800.5; 820.5 and 830.6 "Access to Electrical Equipment Behind Panels Designed to Allow Access" to 725.7; 760.7; 800.7; 820.7 and 830.7, respectively.

Renumber Sections 725.6; 760.6; 800.6; 820.6 and 830.7 "Mechanical Execution of Work" to 725.8; 760.8; 800.8; 820.8 and 830.8, respectively.

Renumber Section 725.8 "Safety-Control Equipment" to 725.11. In the new 725.11(B), change "725.8(A)" to "725.11(A)".

Renumber Section 760.7 "Fire Alarm Circuits Extending Beyond One Building" to 760.11.

Substantiation:

The proposed renumbering will give the sections "Access to Electrical Equipment Behind Panels Designed to Allow Access" and "Mechanical Execution of Work" location and numbering consistent throughout Articles 725, 760, 770, 800, 820 and 830. Such renumbering is in accordance with Section 2.4.1 of the 2001 NEC Style Manual which calls for parallel numbering.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-215 Log #670 NEC-P16 **Final Action: Reject**
(830-7)

Submitter: Dan Leaf Palmdale, CA

Recommendation:

Revise text to read as follows:

Mechanical Execution of Work. Network-powered broadband communications circuits shall be installed in a neat and workmanlike manner. Except where installed in raceways or cable trays, cables ~~installed exposed on the surface of ceilings and sidewalks~~ shall be supported by the structural components of the building structure and fastened in place at intervals not to exceed 1.8m (6 ft) in such a manner that the cable is not likely to be damaged by normal building use. ~~Such~~ Cables shall be attached to structural components by straps, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform to 300.4(D).

Exception: Cables shall be permitted to be unsupported where the cable is fished between access points in finished buildings or structures and supporting is impracticable.

Except where terminated at an approved raceway mast intended for the support of aerial cables, conductors shall not be strapped, taped, or attached to the exterior of any raceway, cable, or piping, as a required means of support.

Substantiation:

In order to conform to a neat and workmanlike manner. cables should be supported and fastened even when not exposed on ceilings and sidewalks, and the spacing of fasteners should be indicated, as it is for other cables.

The proposed exception is similar to Code provisions for other conductors, as is the proposed prohibition of support by raceways and cables.

Panel Meeting Action: Reject

Panel Statement:

The intent of the current text is to address cables "… installed exposed on the surface of ceilings and sidewalls …". The proposed deletion of this text defeats the intent of the section and is unacceptable. The proposed exception for "fishing" is already covered by the existing reference to 300.4(D), Exception No. 2; and the prohibition that conductors "… not be strapped, taped, or attached to the exterior of any raceway, cable, or piping …" is currently covered in 830.58(D).

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-216 Log #853 NEC-P16 (830-7) **Final Action: Accept in Principle**

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 830.7 as follows:

830.7 Mechanical Execution of Work. Network-powered broadband communications circuits and equipment shall be installed in a neat and workmanlike manner. Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the ~~structural components of the~~ building structure in such a manner that the cable is not damaged by normal building use. Such cables shall be attached ~~to structural components~~ by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D).

Substantiation:

Section 830.7 was revised during the 2002 cycle to remove the fine print note referencing the ANSI/EIA/TIA cabling, wiring, and pathways standards. In so doing, the Panel included additional mechanical considerations in the body of the rule (830.7). Taken literally, all cables would have to be supported by building "structural components". This would preclude the attachment of cables to baseboards and walls as these are not "structural components". This proposed change will clarify the intent, yet continue to advise the reader regarding the proper support of cables. It also makes "ceiling" plural. This is a companion proposal and is intended to correlate with similar proposals for 800.6, 820.6, 640.6, 725.6, 760.6, and 770.8.

Panel Meeting Action: Accept in Principle

Revise 830.7 to read as follows:

830.7 Mechanical Execution of Work. Network-powered broadband communications circuits and equipment 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 straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 (D) and 300.11.

FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2001, Standard for Installing Commercial Building Telecommunications Cabling, and other ANSI-approved installation standards.

Panel Statement:

The panel modified the proposal to clarify the submitter's intent. Addition of the FPN incorporates Proposal 16-82 to accommodate a parallel structure throughout Articles 770, 800, 820 and 830.

830.7 becomes new 830.8.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

HUGHES: I feel conformance to 300.11 for this application is overly restrictive. I agree with all other elements of the proposal.

JONES: The submitter's proposal changes in the text did not add clarity or change to the requirements of Article 830.7. The panel added a reference to Article 300.11 to the text, but did not furnish any evidence or technical support that a need or a safety issue exists justifying the reference to the additional installation requirements of Article 300.11.

Comment on Affirmative:

BRUNSSEN: Network-powered broadband communications systems consist of a cable to bring the signal and any needed power from the communications network to the Network Interface Unit located on the exterior of the building or structure. From that point on within the building or structure, the premises wiring and cabling is identical to that for optical fiber cables, communications cables, and coaxial CATV cables of Articles 770, 800 and 820, respectively. Modifications to installations would involve the addition of only a single, or at most, a limited number of small cables. It is overly restrictive to specify that each addition of a single optical fiber, communications, or coaxial CATV cable require installation of additional and separate supports.

JOHNSON: See my Comment on Affirmative on Proposal 16-20.

16-217 Log #85 NEC-P16 (830-9) **Final Action: Accept**

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Section 830.9 as 830.3(F).

Substantiation:

The current Section 830.9, "Hazardous (Classified) Locations" logically fits into section 830.3 "Locations and Other Articles". See the accompanying proposal to change the title of Section 830.3 to "Other Articles".

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-218 Log #86 NEC-P16 **Final Action: Accept**
(830-10)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Revise as follows:
830.10 Entrance Cables. ~~Cables installed outdoors shall be listed as suitable for the application. In addition.~~ Network-powered broadband communications cables located outside and entering buildings shall comply with 830.10(A) and (B).

Substantiation:

Currently, listing requirements are not presented uniformly in similar articles. This proposal makes the NEC more "user-friendly" in that all listing requirements will be included in a new section at the end of Articles 725; 760; 770; 800; 820 and 830. This is similar to the change where the listing requirements for Class 2, Class 3, and fire alarm circuits were moved from Articles 725 and 760 to Chapter 9. By moving the listing requirements into one section at the end of the articles, renumbering the articles so like installation requirements have similar section numbers is possible. This proposal removes the listing requirements from 830.10.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-219 Log #875 NEC-P16 **Final Action: Accept**
(830-11)

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 830.11 to add "network-" as follows:
830.11 Aerial Cables. Aerial network-powered broadband communications cables shall comply with 830.11 (A) through (I).

Substantiation:

The proposed change corrects an omission and correlates with other appearances of the term "network-powered" in Article 830.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-220 Log #2625 NEC-P16 **Final Action: Accept**
(830-11)

Submitter: Robert W. Jensen, dbi-Telecommunications / Rep. BICSI

Recommendation:

Revise text to read as follows:
Aerial network-powered broadband communications cables shall comply with 830.11(A) through (I).

Substantiation:

The word "network" needs to be added to 830.11 (network-powered) to correct an omission.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-221 Log #2952 NEC-P16 **Final Action: Accept**
(830-30(B)(2))

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 830.30(B)(2) as follows:
(2) The primary protector function shall be an integral part of and contained in the network interface unit. The network interface unit shall be listed ~~for the purpose~~ as being suitable for application with network-powered broadband communications systems and shall have an external marking indicatng that it contains primary electrical protection.

Substantiation:

The Usability Task Group of the NEC Technical Correlating Committee has recommended that the term "listed for the purpose" be clarified by stating the expected purpose for which the equipment is to be listed. The proposed revision addresses the Usability Task Group recommendation and clarifies the purpose of the listing requirement. This is a companion proposal and is intended to correlating with similar proposals for 800.4, 800.30(A)(1)(c), 800.30(A)(1)(e), 800.32, and 830.30(B)(3).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-222 Log #2953 NEC-P16 **Final Action: Accept**
(830-30(B)(3))

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 830.30(B)(3) as follows:
(3) The primary protector(s) shall be provided on the derived circuit(s) (output side of the NIU), and the combination of the NIU and the protector(s) shall be listed ~~for the purpose~~ as being suitable for application with network-powered broadband communications systems.

Substantiation:

The Usability Task Group of the NEC Technical Correlating Committee has recommended that the term "listed for the purpose" be clarified by stating the expected purpose for which the equipment is to be listed. The proposed revision addresses the Usability Task Group recommendation and clarifies the purpose of the listing requirement. This is a companion proposal and is intended to correlating with similar proposals for 800.4, 800.30(A)(1)(c), 800.30(A)(1)(e), 800.32, and 830.30(B)(2).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-223 Log #1585 NEC-P16 (830-40) **Final Action: Reject**

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 5 for information.

Submitter: Michael J. Johnston, Int'l Assn. of Electrical Inspectors

Recommendation:

Revise Section 830.40 as follows:

830.40 Cable, Network Interface Unit, and Primary Protector Grounding.

Network interface units containing protectors, NIUs with metallic enclosures, primary protectors, and the metallic members of the network-powered broadband communications cable that are intended to be grounded shall be grounded as specified in 830.40(A) through (D).

(A) Grounding Electrode Conductor.

(1) Insulation. The grounding electrode conductor shall be insulated and shall be listed as suitable for the purpose.

(2) Material. The grounding electrode conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.

(3) Size. The grounding electrode conductor shall not be smaller than 14 AWG and shall have a current-carrying capacity approximately equal to that of the grounded metallic member(s) and protected conductor(s) of the network-powered broadband communications cable. The grounding electrode conductor shall not be required to exceed 6 AWG.

(4) Length. The grounding electrode conductor shall be as short as practicable. In one-family and multifamily dwellings, the grounding electrode conductor shall be as short as permissible, not to exceed 6.0 m (20 ft) in length.

Exception: In one- and two-family dwellings where it is not practicable to achieve an overall maximum grounding electrode conductor length of 6.0 m (20 ft), a separate communications ground rod meeting the minimum dimensional criteria of 830.40(B)(2)(2) shall be driven, and the grounding electrode conductor connected to the communications ground rod in accordance with 830.40(C). The communications ground rod shall be bonded to the power grounding electrode system in accordance with 830.40(D).

(5) Run in Straight Line. The grounding electrode conductor shall be run to the grounding electrode in as straight a line as practicable.

(6) Physical Protection. Where subject to physical damage, the grounding electrode conductor shall be adequately protected. Where the grounding electrode conductor is run in a metal raceway, both ends of the raceway shall be bonded to the grounding electrode conductor or the same terminal or electrode to which the grounding electrode conductor is connected.

(B) Electrode. The grounding electrode conductor shall be connected as follows.

(1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:

(1) The building or structure grounding electrode system as covered in 250.50;

(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered in 250.52;

(3) The power service accessible means external to enclosures as covered in 250.94;

(4) The metallic power service raceway;

(5) The service equipment enclosure;

(6) The grounding electrode conductor or the grounding electrode metal enclosure; or

(7) The grounding electrode conductor or the grounding electrode of a building or structure disconnecting means that is grounded to an electrode as covered in 250.32.

For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 830.33, shall be considered accessible.

(2) In Buildings or Structures Without Grounding Means. If the building or structure served has no grounding means, as described in (B)(1):

(1) To any one of the individual electrodes described in 250.52(A)(1), (2), (3), (4); or

(2) If the building or structure served has no grounding means, as described in 830.40(B)(1) or (B)(2)(1), to an effectively grounded metal structure or to a ground rod or pipe not less than 1.5 m (5 ft) in length and 12.7 mm (1/2 in.) in diameter, driven, where practicable, into permanently damp earth and separated from lightning conductors as covered in 800.13 and at least 1.8 m (6 ft) from electrodes of other systems. Steam or hot water pipes or lightning-rod conductors shall not be employed as electrodes for protectors, NIUs with integral protection, grounded metallic members, NIUs with metallic enclosures, and other equipment.

(C) Electrode Connection. Connections to grounding electrodes shall comply with 250.70. Connectors, clamps, fittings, or lugs used to attach grounding conductors and bonding jumpers to grounding electrodes or to each other that are to be concrete encased or buried in the earth shall be suitable for its application.

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the network-powered broadband communications system grounding electrode and the power grounding electrode system at the building or structure served where separate electrodes are used.

Exception: At mobile homes as covered in 830.42.

FPN No. 1: See 250.60 for use of lightning rods.

FPN No. 2: Bonding together of all separate electrodes limits potential differences between them and between their associated wiring systems.

Substantiation:

This revision is required to establish consistent use of terms between Article 250 and Article 830. This change is consistent with a similar change to Section 250.32 in the 2002 NEC. This change is not intended to change any of the requirements of the Code. It is just a revision that will work to promote a common language of communication and consistent use of the terms for a conductor that performs the same functions but is currently titled differently.

Panel Meeting Action: Reject

Panel Statement:

The term "grounding electrode conductor" is specific to the conductor used to connect the grounding electrode(s) to the equipment grounding conductor, to the grounded conductor, or to both, at the service (see Article 100, "grounding electrode conductor"). The conductor of 800.40 is a true grounding conductor, used to connect the primary protector (grounded circuit of the communications system), to the power service ground (see Article 100, "grounding conductor").

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-224 Log #848 NEC-P16 **Final Action: Accept**
(830-40(A)(4))

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Add fine print note to 830.40(A)(4) as follows:
"FPN: Similar grounding conductor length limitations applied at apartment buildings and commercial buildings will help to reduce voltages that may be developed between the building's power and communications systems during lightning events."

Substantiation:

When the 20-foot limitation was instituted in the 2003 NEC, apartment and commercial buildings were specifically not addressed as it was felt the predominant issue was in one- and two-family dwellings. In retrospect, some guidance should be provided for apartment and commercial buildings, without being overly restrictive because of intersystem bonding situations that may exist at these facilities. The proposed FPN provides guidance for the treatment of the cable shield grounding conductor length at apartment and commercial buildings, consistent with the new 20-foot rule for one- and two-family dwellings, but does not place untenable restrictions on the actual length. This is a companion proposal and is intended to correlate with similar proposals for 800.40 (A)(4) and 820.40(A)(4).

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 13 Negative: 2

Explanation of Negative:

JOHNSON: See my Explanation of Negative for Proposal 16-96.
TODD: See my Explanation of Negative for Proposal 16-96 (Log #846).

Comment on Affirmative:

16-225 Log #2013 NEC-P16 **Final Action: Reject**
(830-40(B)(1))

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute - Electric Light & Power Group

Recommendation:

Delete items (3) through (5) in 830.40(B)(1) and renumber (6) to (3) and (7) to (4) as follows:
(1) In Buildings or Structures with Grounding Means. To the nearest accessible location on the following:
(1) The building or structure grounding electrode system as covered in 250.50;
(2) The grounded interior metal water piping system, within 1.5 m (5 ft) from its point of entrance to the building, as covered n 250.52;
~~(3) The power service accessible means external to enclosures as covered in 250.94;~~
~~(4) The metallic power service raceway;~~
~~(5) The service equipment enclosure;~~
(3)~~(6)~~ The grounding electrode conductor or the grounding electrode metal enclosure; or
(4)~~(7)~~ The grounding conductor or the grounding electrode of a building or structure disconnecting means that is grounded to an electrode as covered in 250.32.
For purposes of this section, the mobile home service equipment or the mobile home disconnecting means, as described in 830.33, shall be considered accessible.

Substantiation:

Items (3), (4), and (5) of existing 830.40(B)(1) are not methods of grounding. The present reference to 250.94 is a requirement for bonding, which does not cover the grounding requirement of this type of wiring system in Article 830.
Electric utilities encounter poor grounding practices made by installers of CATV and telephone company services such as a clip on a meter socket trough. These are not accepted practices by the utility industry nor the NEC and removing these items from 830.40(B)(1) will make it clear as to what constitutes a proper grounding connection.
Note: Supporting material is available for review at NFPA Headquarters.

Panel Meeting Action: Reject

Panel Statement:

The purpose of this section is to provide the reader with a list of all the acceptable connections for the grounding of communications systems. Connecting to a component of the building grounding system that is part of the electric power service ground also satisfies the requirement to bond between the two systems that is inherent in 830.40(B)(1) and 830.40(D). While the issue may be one of semantics, the items referenced by the submitter are indeed acceptable connections as detailed in 250.94 and should not be deleted. The proposal fails to address the submitter's concern which is the failure of some communications utilities to make the connections properly when applying 830.40(B)(1), items 3, 4 and 5. The problem arises when an accessible means external to enclosures has not been made available. Where the power service has been installed per 250.94, connectors and clamps are available to make these connections properly. It is up to the AHJ to enforce the proper application of the Code.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

TODD: The proposal should have been accepted in part, deleting item No. 5. The meter socket enclosure itself is NOT service equipment according to 230.66 and therefore is not an approved connection point. Connections of the clamp to the cover of the meter socket do not guarantee a proper conductive path and do not facilitate the removal of the cover. Devices designated to be attached to the cover of a meter socket should not be listed for this purpose. This proposal should also be associated with similar sections of Articles 800 and 820.

16-226 Log #1297 NEC-P16 **Final Action: Accept in Principle**
(830-52(A)(1)(d) Exception No. 1)

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Revise text to read as follows:
(d) Electric Light, Power, Class 1, Non–Powered Broadband Communications Circuit Cables. Network-powered broadband communications cable shall not be placed in any raceway, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non–power-limited fire alarm circuit cables.
Exception No. 1: Where all of the conductors of electric light, power, Class 1, non–power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Substantiation:

This proposal defines that the barrier is a permanent function of the enclosure or that a removable or field installed divider that has been listed may be used to divide the network-powered broadband communications cables from the power circuits.

Panel Meeting Action: Accept in Principle

Change the reference from 830-52(A)(1)(d) to 830-58(A)(1)(d) in Exception No. 1.

Panel Statement:

The submitter referenced 830-52(A)(1)(d) Exception No. 1; the correct reference should be 830-58(A)(1)(d) Exception No. 1.
830.58 becomes new 830.55.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-228 Log #1765 NEC-P16 **Final Action: Reject**
(830-54)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

830.54 Medium Power Network-Powered Broadband Communications System Wiring Methods.
Medium power network-powered broadband communications systems shall be installed within buildings using listed Type BM or Type BMR, network-powered broadband communications medium power cables.
(A) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) ~~Ducts, Plenums, and Other Air-Handling Spaces~~. Cables shall be installed in plenums, including ceiling cavity plenums and raised floor plenums, in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type BMP. The accessible portion of abandoned medium power network-powered broadband communications cables shall not be permitted to remain. ~~Section 300.22 shall apply.~~
(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-228 substantiation is shown on page 2632]

Panel Meeting Action: Reject

Panel Statement:

Section 830.54 requires medium power cable in plenums to be installed in metallic raceway per 300.22. This proposal does not provide any substantiation to allow medium power cable in plenums without a metallic enclosure. Type BMP cable does not exist.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-227 Log #88 NEC-P16 **Final Action: Accept**
(830-54, 830.55, 830.56 and 830.57)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber Sections 830.54; 830.55; 830.56; and 830.57 to be 830.60; 830.61; 830.62 and 830.63, respectively.
Change the name of the new Section 830.61 from "Low-Power Network-Powered Broadband Communications System Wiring Methods" to "Applications of Listed Low-Power Network-Powered Broadband Communications Cables".
In the first sentence of 830.55 (new 830.61), change "830.55(A)" to "830.61(A)".
In 830.55(C) (new (830.61(C)), change "830.55(C)(1)" to "830.61(C)(1)".
In 830.55(D) (new 830.61(D)), change "830.55" to "830.61" twice.
In Section 830.3(B) Exception, change "830.55(B)" to "830.61(B)".

Substantiation:

With these changes, Sections 830.54 and 830.55 are aligned with similar sections in Articles 725; 760; 770; 800 and 820. The other sections are displaced accordingly. Changing the title of (new) Section 830.61 makes it consistent with the other xxx.61 sections.
This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-229 Log #1766 NEC-P16 **Final Action: Reject**
(830-55)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods.
Low-power network-powered broadband communications systems shall comply with any of the requirements of 830.55(A) through (D).
(A) In Buildings. Low-power network-powered broadband communications systems shall be installed within buildings using listed Type BLX or Type BLP network-powered broadband communications low power cables.
(B) Plenum (Including Ceiling Cavity Plenum and Raised Floor Plenum) ~~Ducts, Plenums, and Other Air-Handling Spaces~~. Cables shall be installed in plenums, including ceiling cavity plenums and raised floor plenums, in compliance with 300.22 (C). Cables installed without enclosure in a metal raceway shall be Type BLP. The accessible portion of abandoned low power network-powered broadband communications cables shall not be permitted to remain. ~~Type BLX cable installed in compliance with 300.22 shall be permitted.~~
(Remainder of section to stay unchanged)

Substantiation:

[Text of Proposal 16-229 substantiation is shown on page 2641]

Panel Meeting Action: Reject

Panel Statement:

The Air Conditioning Committee's Proposals 16-46, 16-15 and 16-64 list plenum cables (OFNP, OFCP, CMP, MPP, CATVP) for use in ceiling cavity plenums and raised floor plenums and restricts their use to ceiling cavity plenums and raised floor plenums.
This proposal conflicts with the proposals from the Air Conditioning Committee.
This proposal permits unrestricted use of Types OFNP, OFCP, CMP, MPP and CATVP cables in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of listing and use of plenum cables would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.
The Air Conditioning Committee in NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems, has specific requirements for cables installed in ceiling cavity plenums (4.3.10.2) and raised floor plenums (4.3.10.6). It also has requirements for supplementary materials installed in an air distribution system (4.3.3). Type OFNP, OFCP, CMP, MPP and CATVP cables listed in accordance with NFPA 262 do not meet the requirements for installation in the air distribution system, other than in ceiling cavity plenums and raised floor plenums.
The portion of the proposal that deals with cables being removed was addressed in proposal 16-141.
The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-230 Log #871 NEC-P16 (830-55(B)) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that it is Proposal 16-211 that accomplishes the Submitter's intent.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise the second sentence of 830.55 (B) as follows:
The accessible portion of ~~A~~abandoned cables in hollow spaces shall not be permitted to remain.

Substantiation:

Correlates with 820.3 (A) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 820.53 (B) (1), 820.53 (D), 830.55 (C) (1), 725.61 (A) and 725.61 (B) (1).

Panel Meeting Action: Accept in Principle

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain."

Panel Statement:

Proposal 16-75 accomplished the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: This proposal would also remove the requirement "Abandoned cables shall not be permitted to remain" within the plenum and riser sections that have been referenced here and replace it with "accessible portions of abandoned cables shall not be permitted to remain (from 830.3 (A)). Most submitters to this proposal did not strike out or change the requirement for the removal of abandoned cables in plenums and risers. However this accepted proposal makes this change. There is no technical substantiation to leave the non-accessible portion of the abandoned cable in plenums and riser areas and therefore should not be aloud to remain. "Inaccessible" could have a broad scope of meaning to installers or the AHJ.

Every effort to remove abandoned cables should be made. Therefore the requirements of 300.22 (B) should be complied with. Most cables installed per 300.22 (B) can be removed.

16-231 Log #872 NEC-P16 (830-55(C)(1)) **Final Action: Accept in Principle**

TCC Action:

The Technical Correlating Committee understands that it is Proposal 16-194 that accomplishes the Submitter's intent.

Submitter: James E. Brunssen, Telcordia Technologies, Inc. / Rep. Alliance for Telecommunications Industry Solutions

Recommendation:

Revise 830.55 (C) (1), last sentence, as follows:
The accessible portion of ~~A~~abandoned cables shall not be permitted to remain.

Substantiation:

Correlates with 820.3 (A) and other similar requirements throughout Chapters 7 and 8. The change is in keeping with CMP 16's original intent that only the accessible portion of abandoned cable need be removed. This is a companion proposal and is intended to correlate with similar proposals for 820.53 (B) (1), 820.53 (D), 830.55 (B), 725.61 (A) and 725.61 (B) (1).

Panel Meeting Action: Accept in Principle

Proposal 16-75 accomplished the submitter's intent. In the Section, "Other Articles" requires that "The accessible portion of abandoned cables shall not be permitted to remain."

Panel Statement:

Proposal 16-75 accomplished the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

OHDE: See my Explanation of Negative on Proposal 16-230 (Log #181).

16-232 Log #68d NEC-P16 **Final Action: Accept**
(830-58)

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Renumber sections 770.52; 800.52; 820.52 and 830.58 to be 770.55; 800.55; 820.55 and 830.55, respectively.
Renumber the reference to 800.52(D) in 725.61(C) to 800.55(D).
In the first sentence of 800.52 (new 800.55), change "800.52(A)" to "800.55(A)".
In the first sentence of 830.58 (new 830.55), change "830.58(A)" to "830.55(A)".
In 830.58(C) (new 830.55(C)), change "Table 830.58" to "Table 830.55" three times.

Substantiation:

This change lines up Section 725.55 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium Power Network-Powered Broadband Communications Cables, Section 760.55 Separation from Electric Light, Power, Class 1, NPLFA, and Medium Power Network-Powered Broadband Communications Circuit Conductors, Section 770.52 Installation of Optical Fibers and Electrical Conductors, Section 800.52 Installation of Communications Wires, cables, and Equipment, Section 820.52 Installation of Cables and Equipment and Section 830.55 Low-Power Network-Powered Broadband Communications System Wiring Methods. These sections apply to similar requirements. With this change, all these sections will have the section number xxx.55.

This change improves editorial consistency between articles and complies with Section 3.3.5 of the 2001 National Electrical Code Style Manual.

Panel Meeting Action: Accept

Panel Statement:

The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-234 Log #1767 NEC-P16 **Final Action: Reject**
(830-58)

TCC Action:

See Technical Correlating Committee Note on Proposal 16-9.

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association, Plenum Cable Association, and Vinyl Institute EOTS

Recommendation:

830.58 Installation of Network-Powered Broadband Communications Cables and Equipment.
Cable and equipment installations within buildings shall comply with 830.58(A) through (E), as applicable.
(A) and (B) to stay unchanged
(C) Equipment in ~~Other Space Used for Environmental Air~~ Plenums, Including Ceiling Cavity Plenums and Raised Floor Plenums . Section 300.22(C) shall apply.
(Remainder of section to stay unchanged

Substantiation:

[Text of Proposal 16-234 substantiation is shown on page 2650]

Panel Meeting Action: Reject

Panel Statement:

This proposal conflicts with the proposals from the Air Conditioning Committee.

This proposal permits unrestricted use of equipment in all types of plenums. By changing the wording from "ceiling cavity plenums and raised floor plenums" (Mattern's proposals) to "plenums, including ceiling cavity plenums and raised floor plenums" the scope of the use of equipment would be expanded to include duct distribution plenums, apparatus casing plenums and air handling unit room plenums.

The Panel recommends that the TCC forward this proposal to the Air Conditioning Committee for comment.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-233 Log #87 NEC-P16 **Final Action: Accept**
(830-58, 830.3 and 830.55 (New, no the existing 830.55))

Submitter: Stanley D. Kahn, Tri-City Electric Co., Inc. / Rep. NECA

Recommendation:

Delete Section 830.58(B).
Renumber Section 830.3(D) to 830.3(E).
Renumber Section 830.3(C) to (new) 855.3(D).
Renumber Section 830.58(C) to 830.3(C).
Renumber Section (old) 830.58(D) to new 830.55(B).
Renumber Section (old) 830.58(E) to (new) 830.55(C).

Substantiation:

Section 830.58(B) is redundant. This requirement is covered in section 830.3(A). Section 830.58(C) belongs in section 830.3 Locations and Other Articles. A separate proposal renumbers the existing section 830.58 to 830.55. This proposal correlates with that one.

Panel Meeting Action: Accept

Panel Statement:

Section references are new, based upon pro forma restructure as per Proposal 16-205.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-235 Log #413 NEC-P16 **Final Action: Reject**
(830-58(A)(1)
)

Submitter: Steven C. Johnson, Time Warner Cable

Recommendation:

Revise text to read as follows:
(1) In Raceways and Enclosures.
(a) Low and Medium Power Network-Powered Broadband Communications Circuits, Low and medium power network-powered broadband communications, circuits shall be permitted in the same raceway or enclosure.
(b) Low Power Network-Powered Broadband Communications Circuits, Low power network-powered broadband communications circuits shall be permitted in the same raceway or enclosure with jacketed cables of any of the following circuits:
(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 725
(2) Power-limited fire alarm systems in compliance with Article 760
(3) Communications circuits in compliance with Article 800
(4) Nonconductive and conductive optical fiber cables in compliance with Article 770
(5) Community antenna television and radio distribution systems in compliance with 820(c). Medium Power Network-Powered Broadband communications Circuits, Medium power network-powered broadband communications circuits shall not be permitted in the same raceway or enclosure with conductors of any of the following circuits.

Substantiation:

Low power Network-Powered Broadband Communications circuits are permitted to use medium power cables according to the cable substitution charts. It is the circuits, not the cables, which should be properly separated in raceways.

Panel Meeting Action: Reject

Panel Statement:

Section 830.58 deals with separation of cables and equipment, and not circuits. The existing Code wording is clear.
The panel acts on the portions of the proposal that deal with the articles under its jurisdiction.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-236 Log #3511 NEC-P16 **Final Action: Reject**
(830-58(A)(2), FPN (New))

Submitter: Leif O. Pihl Minneapolis, MN

Recommendation:

Add a Fine Print Note to section 830.58(A)(2) to read as follows:
FPN: See also 300.3(C)(1), 800.12(B) and 820.52(A)(2) for cable separation requirements.

Substantiation:

Electricians are often unaware of the different clearances that communication, coax and data cables need, both from each other and from AC power conductors. Electricians need this information when laying out the conduit runs. If the separation requirements are noticed late in the installation, last minute changes to conduit runs need to be made. I have noticed, upon more occasions than I can count, that when these clearances are pointed out late in the process that they are usually either ignored or resolved in a haphazard method that does not allow for proper conduit and/or cable support. Adding these cross-references will increase the chance that they will be aware of, and pay attention to these clearances earlier in the installation process.

This proposal along with the other three (see below), will help safety by reducing these late changes where support distances, securing, and other requirements could then be overlooked or ignored.

Note: Similar proposed changes have been submitted for Sections 300.3(C)(1)FPN, 800.12(B)FPN, 820.52(A)(2)FPN and 830.58(2)FPN. These four proposals work together.

Panel Meeting Action: Reject

Panel Statement:

Separation requirements are adequately covered in 830.11, 830.12, and 830.58(A)(1) and (2). Reference to 300.3(C)(1) is inappropriate as Chapter 8 stands alone (see 90.3) and the Chapter 8 rules are more stringent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-237 Log #3478 NEC-P16 **Final Action: Reject**
(Table 830-58(E))

Submitter: Timothy D. Cooke, Times Fiber Communications, Inc.

Recommendation:

Revise Table 830.58 Cable Substitutions, to include cables approved for use and listed per Article 820, Community Antenna Television and Radio Distribution Systems, CATV Type. Table to be amended to reflect the following:
BLX - add CATVP, CATVR, and CATV cables types.

****Insert Tbl 830.58 L3478 here****

(Table shown on page 2782)

Substantiation:

Presently, the cables which are tested and approved for use per NEC 2002, 820.49, are not recognized as permitted substitutions for CATV installations per NEC 2002 820.53, Table 53. With the inclusion of the Article 820 cable types as permitted substitutions for Article 830, BLX cable types, cable manufacturers and operators have more flexibility with product offerings and inventory management, while ensuring that the safety requirements are maintained for Network-Powered Broadband Communications Cable installations.

Panel Meeting Action: Reject

Panel Statement:

Type CATV cables cannot be substituted for Article 830 cables because Type CATV cables do not have a voltage rating.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

16-238 Log #1298 NEC-P16 **Final Action: Reject**
(830-59 (New))

Submitter: David H. Kendall, Carlon, Lamson & Sessions

Recommendation:

Add new text to read as follows:

830.59 Network-Powered Broadband Communication Device and Equipment Mounting.

Network-Powered Broadband Communication devices or equipment shall be mounted in listed boxes or assemblies designed for the purpose, and such boxes or assemblies shall be securely fastened in place. Boxes can either be completly enclosed or backless.

(A) Network-Powered Broadband Communication Devices and Equipment Mounted in Boxes. Network-Powered Broadband Communication devices or equipment shall be mounted in listed boxes and installed per 314.20.

(B) Network-Powered Broadband Communication Devices and Equipment Mounted on Covers. Network-Powered Broadband Communication device and equipment mounted to and supported by a cover shall be held rigidly against the cover which is mounted to the box.

(C) Wet Locations. Optical Fiber devices and equipment installed in a wet location shall use a cover that is listed for a wet location whether or not the device is in use.

FPN: See Article 100 for the definition of a "Wet Location".

Substantiation:

This proposal adds a new section to Article 830 addressing the mounting of devices or equipment to listed boxes. Currently, depending on the quality of workmanship, Network-Powered Broadband Communication devices or equipment have not been mounted to boxes that can support them. After several years device and/or covers that are mounted directly to the dry wall will become hazard because they have become loose and exposed. Network-Powered Broadband Communication devices used in a wet location, as defined in Article 100, shall have the connection protected from the elements by an in-use weatherproof cover.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided no data supporting an existing hazard. The submitter offers only an individual opinion that, depending on the quality of workmanship, equipment or devices mounted directly to a dry wall may, over time, loosen and become a hazard. The addition of listed boxes or assemblies will not, in itself, guarantee a hazard-free installation. The same quality of workmanship is necessary to help ensure a hazard-free equipment installation whether listed boxes are used or not.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 15

8-293 Log #307 NEC-P08 **Final Action: Reject**
(Chapter 9, Table 4)

Submitter: James Guthire, Milwaukee Area Technical College

Recommendation:

Revise the Table to read as follows:

Insert Table Here

(Table shown on page 2733)

Substantiation:

To simplify identification of trade sizes of conduit and tubing using the metric designator. As the trade sizes of conduit and tubing in the English system do not reflect actual dimensions of respective conduit or tubing, the metric designator also need not reflect the actual dimensions. A sequence of designators in steps of 5's and 10's would be easier to remember and, therefore, use.

Panel Meeting Action: Reject

Panel Statement:

The metric designators were not derived by the NFPA or the panel members of the NEC. Metric designators were added to the 1996 NEC through proposals generated by NEMA. This change would only confuse the system since federal agencies and product specification have incorporated the metric designators.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Cox

8-294 Log #3067 NEC-P08 **Final Action: Accept**
(Chapter 9 Table 4)

Submitter: Wally Harris, Atlantic Inland Inspections

Recommendation:

Rearrange Table headings as noted.

Insert Table 4 Here

(Table shown on page 2733)

Substantiation:

Proposed format will make the table easier to use, by an increasing progression from 1, to 2, to 3.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Cox

6-106 Log #2110 NEC-P06 **Final Action: Accept**
(Chapter 9 Table 5)

Submitter: Lawrence S. Cross, Burlington County Institute of Technology

Recommendation:

Please revise and clarify the dimensions of #10 THW wire insulation on page 622.

Substantiation:

The dimension of #10 THW wire is listed twice in Table 5 of Chapter 9 with different dimensions stated each time but shown in the 1999 NEC the dimension was listed once @ Approximate Diameter (0.206) inch and Approximate Area (0.0333) inch. What is the correct dimension for #10 THW insulation in the 2002 NEC?

Panel Meeting Action: Accept

Panel Statement:

This was corrected in the 2002 NEC Errata.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-107 Log #3278 NEC-P06 **Final Action: Accept**
(Chapter 9, Table 5)

Submitter: Jim McCluskey, Ortlip Electric

Recommendation:

Table 5 under Type column leaves no identification for insulated conductors - the third group of conductors under type column page 622 are unidentified.

Substantiation:

None provided.

Panel Meeting Action: Accept

Panel Statement:

This was corrected in the 2002 NEC Errata.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-108 Log #2896 NEC-P06 **Final Action: Accept**
(Chapter 9, Table 5A)

Submitter: Larry G. Watkins, Alcan Cable

Recommendation:

Add 900 kcmil compact aluminum conductor dimensions to [Existing] Table 5A:

Insert table 5A/A04/ROP/here*

(Table shown on page 2730)

Substantiation:

Dimension data for 900 kcmil missing from Table 5A. Dimensions proposed are from industry sources. The information is necessary for installation of 900 kcmil compact aluminum conductors.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-109 Log #2897 NEC-P06 **Final Action: Accept**
(Chapter 9, Table 5A)

Submitter: Larry G. Watkins, Alcan Cable

Recommendation:

Remove "Number of Strands" column from Table 5A as noted on the revised Table.

Insert table 5A/A04/ROP/here

(Table shown on page 2730)

Substantiation:

Product standards permit the use of number of strands other than those listed in table to construct compact standed conductors. "Number of Strands" column is not included in Table 5.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-110 Log #133 NEC-P06 **Final Action: Reject**
(Chapter 9, Table 8)

Submitter: Jeff Gerrard, Gerrard Electric of Southern Florida

Recommendation:

A column should be made for the exact K factor for all wire types and sizes.

Substantiation:

The reason is the NEC book being a guide and reference manual for the tradesman, the importance of having the Exact K factor for finding wire sizing and voltage drops justifies having this column.

Panel Meeting Action: Reject

Panel Statement:

90.1(C) states, "This Code is not intended as a design specification or an instruction manual for untrained persons."

In addition, the submitter has not complied with the requirements of 4-3.3(b) and (c) of the Regulations Governing Committee Projects that proposals address specific sections of the Code and must provide the specific "wording to be added, revised (and how revised), or deleted."

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-111 Log #204 NEC-P06 **Final Action: Accept**
(Chapter 9, Table 8)

Submitter: Mike Charles Powers, MI

Recommendation:

Complete the column of cross-sectional area of conductors in square millimeters by adding the following numbers for 250 kcmil through 2000 kcmil:

***Include NEC-L204-Table 8 ***

(Table shown on page 2731)

Substantiation:

Table 8 provides useful information for performing voltage drop calculations such as required in Section 695.7. When performing such calculations using SI units, it is necessary to know the actual cross-sectional area of the conductor in square millimeters. Overall area is not useful for these calculations. The cross-sectional area of conductors size 250 kcmil and larger is not given in Table 8.

Also, the cross-sectional area in square millimeters is needed when making an adjustment in size of the equipment grounding conductor when the ungrounded conductor size was increased such as the case where adjustments are made for voltage drop as specified in Section 250.122(B).

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

3-300 Log #2428 NEC-P03 **Final Action: Accept in Principle**
(Chapter 9, Table 12 (B))

Submitter: Larry Neibauer, Automatic Fire Alarm Association

Recommendation:

Revise Chapter 9, Table 12(B) by deleting the column with the heading, "Over 100 and through 250".
The other columns and headings do not change.

Substantiation:

The "Over 100 and through 250" column was inserted in the 1975 edition of the NEC to permit installation of a 220 VDC, Pyrotronics smoke detector. The current limitation is 30 ma. This smoke detector has been out of production for about 20 years, and is no longer listed.

Existing detectors installed under a previous code would continue to meet that code. If repair is necessary, Underwriters Laboratories now has a listing program to provide replacement products.

The UL Program is UTHH Fire Alarm Replacement Parts.

Note: Supporting available for review at NFPA headquarters.

Panel Meeting Action: Accept in Principle

Panel Statement:

See Panel action on Proposal 3-301.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

3-301 Log #2322 NEC-P03 **Final Action: Accept**
(Chapter 9, Table 12 (B))

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

Recommendation:

Revise Chapter 9, Table 12(B) by deleting the column with the heading, "Over 100 and through 250".
The other columns and headings do not change.

Substantiation:

The "Over 100 and through 250" column was inserted in the 1975 edition of the NEC to permit installation of a 220 VDC, Pyrotronics smoke detector. The current limitation is 30 ma. This smoke detector has been out of production for about 20 years, and is no longer listed.

Existing detectors installed under a previous code would continue to meet that code. If repair is necessary, Underwriters Laboratories now has a listing program to provide replacement products. The UL program is UTHH Fire Alarm System Replacement Parts, as shown on my submitted documentation.

The original manufacturer of the smoke detector is a member of NEMA and agrees with removing the 100 to 250 volt column.

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

Panel Meeting Action: Accept

Panel Statement:

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

6-112 Log #1172 NEC-P06 **Final Action: Reject**
(Table B.310.1 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

13-156a Log #CP1304 NEC-P13 **Final Action: Accept**
(Annex A)

TCC Action:

It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 1 for action. This action will be considered by Code-Making Panel 1 as a public comment.

Submitter: Code-Making Panel 13

Recommendation:

CMP-13 desires to add the following UL Products Standards to Annex A:
UL 924, Emergency Lighting and Power Equipment.
UL 1703, Flat-Plate Photovoltaic Modules and Panels.
UL 2200, Stationary Engine Generator Assemblies.

Substantiation:

These product standards correspond to the requirements within the articles that are under the jurisdiction of CMP 13.

Panel Meeting Action: Accept

Panel Statement:

The panel understands that this proposal is under the jurisdiction of the Technical Correlating Committee.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

11-114 Log #CP1106 NEC-P11 **Final Action: Accept**
(Annex A)

Submitter: Code-Making Panel 11

Recommendation:

Add the following Product Safety Standards related to Articles 430, 440, and 460 to Annex A:

ARC-FAULT CIRCUIT-INTERRUPTERS - UL 1699

CAPACITORS - UL 810

ELECTRIC MOTORS - UL 1004

HEATING AND COOLING EQUIPMENT - UL1995

HIGH VOLTAGE INDUSTRIAL CONTROL EQUIPMENT - UL 347

INDUSTRIAL CONTROL PANELS - UL 508A

MOTOR CONTROL CENTERS - UL 845

MOTOR-OPERATED APPLIANCES - UL 73

POWER CONVERSION EQUIPMENT - UL 508C

ROOM AIR CONDITIONERS - UL 484

Substantiation:

Products listed to these product safety standards meet specific product listing requirements of the NEC, or are identified for the purpose and meet the requirements of the NEC. The products covered by these standards are directly related to the requirements contained in Articles 430, 440, 460 of the NEC.

Panel Meeting Action: Accept

Number Eligible to Vote: 14

Ballot Results: Affirmative: 14

6-113 Log #1173 NEC-P06 **Final Action: Reject**
(Table B.310.3 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-114 Log #1174 NEC-P06 **Final Action: Reject**
(Table B.310.5 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-115 Log #1175 NEC-P06 **Final Action: Reject**
(Table B.310.6 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-116 Log #1176 NEC-P06 **Final Action: Reject**
(Table B.310.7 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-117 Log #1177 NEC-P06 **Final Action: Reject**
(Table B.310.8 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-118 Log #1178 NEC-P06 **Final Action: Reject**
(Table B.310.9 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

6-119 Log #1179 NEC-P06 **Final Action: Reject**
(Table B.310.10 Note (New))

Submitter: John E. Conley Stratford, CT

Recommendation:

Add new footnote to table:
Ampacities in this table have been calculated using the formula given in section 310-15(C).

Substantiation:

This is a correlating proposal offered in conjunction with a proposal to revise the ampacity definition in Article 100. See substantiation to that proposal.

Panel Meeting Action: Reject

Panel Statement:

See panel action and statement on Proposal 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

8-295 Log #2834 NEC-P08 **Final Action: Reject**
(Annex C)

Submitter: Steven R. Musial, II, Carl J. Long & Associates, Consulting Elec. Eng.

Recommendation:

Several (but not all) conduit fill tables are missing 3 AWG conductor from the tables.

Substantiation:

Three AWG conductor exists, but has been omitted in several conduit tables.

Panel Meeting Action: Reject

Panel Statement:

There is no specific recommendation made by the submitter.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Cox

8-296 Log #3204 NEC-P08 **Final Action: Reject**
(Annex C, Tables C1(A) thru C12(A))

Submitter: Larry G. Watkins, Alcan Cable

Recommendation:

Add 900 kimcil compact conductors to all compact conductor conduit fill tables as follows:

INSERT TABLES C1(A) THROUGH C12 (A) HERE

(Tables shown on pages 2734)

Substantiation:

Data is not included in the compact conductor tables. The information is necessary for installation of 900 kcmil compact conductors.

Panel Meeting Action: Reject

Panel Statement:

The submitter has provided no technical substantiation or calculations to support the additional table material.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 12 Negative: 1

Ballot Not Returned: 1 Cox

Explanation of Negative:

DOLLINS: The proposal should be accepted. The additional table material supplied by the submitter for 90 kcmil compact conductors were from ASTM B 801 and the conduit fill calculations were made in accordance with the conduit fill requirements of the NEC.

8-297 Log #1363 NEC-P08 **Final Action: Reject**
(Annex C, Table 13)

Submitter: David Sroka Turner Falls, MA

Recommendation:

Add a new Table:
"Maximum Number of Two-Hour, Fire-Rated RHH Conductors in Rigid Metal Conduit (RMC)."

Substantiation:

1. Allow only RMC (no EMT) for greater survivability.
2. Misuse of the normal (smaller diameter) RHH wire tables can be avoided.

Panel Meeting Action: Reject

Panel Statement:

There is no specific recommendation provided by the submitter.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 13

Ballot Not Returned: 1 Cox

2-362 Log #1502 NEC-P02 **Final Action: Reject**
(Annex D)

Submitter: Jeremy J. Lehman, Encompass Electric

Recommendation:

Provide in Annex D formulas for voltage drop, the ohms wheel, power factor formula and a formula to find efficiency.

Substantiation:

These formulas will provide the electrician a means to calculate formulas in the field as they arise.

Panel Meeting Action: Reject

Panel Statement:

There are other references for the proposed material. It is not intended that the Code be a handbook on electrical theory.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

2-363 Log #2081 NEC-P02 **Final Action: Reject**
(Annex D)

Submitter: Chris Schaefer, Encompass Electrical Technologies

Recommendation:

Service entrance conductors for schools (optional method)
3ø 480v 4,300,000 va 100,000 sq ft
4,300,00 va ÷ 1,000000 sq ft = 43 va per sq ft
First 3va at 100 percent 43 va - 3va = 40 va 3va
Second 17va at 75 percent 40 va - 17 va = 23 va 17va x .75 = 12.75va
remainder at 25 percent 23va x .25 = 5.75va

3va
12.75 va
+ 5.75 va
= 21.5va per sq ft 21.5 x 1,000,000 sq ft = 2,150,000va

2,150,000 va ÷ 480v ÷ 1.732 = 2586 Amps

Substantiation:

There is no school calculation for reference in the current code book. This will resolve difficulties in calculating correct loads.

Panel Meeting Action: Reject

Panel Statement:

An example in Annex D to show the use of a demand factor table is not necessary.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

2-364 Log #213 NEC-P02 **Final Action: Reject**
(Example D 1 (b))

Submitter: Tom Henry, Code Electrical Classes, Inc.

Recommendation:

Delete text as follows:
~~Example D1(b) One-Family Dwelling. (Entire section)~~

Substantiation:

Electrical license exams being written today rely on the answers from the calculations in Annex D - Examples. Even though the NEC is not intended as a design manual, it is the source being used by testing agencies to determine the electricians livelihood. Although the panel members feelings may be it is not to be used as a design manual it is time to face reality. We need to dot the "i" and cross the "t" in the Examples used in the NEC. The example as shown adds nothing to safety and one must admit, it certainly is not shown accurately nor correctly in accord with the basic principles of electrical theory. It may not seem important enough to you but to an electrician failing an exam by a percentage point it can mean the world.

• A PANEL STATEMENT from the 2002 ROP stated: "Being formally trained in a nationally recognized program is not the only way for a person to become a qualified person. Lack of formalized training also does not mean that a person is ignorant of the basic principles of electric theory."

• Please print the pages I have provided so I won't be accused of "insufficient substantiation".

ANNEX D - Examples

Insert Table Here

(Table shown on page 2696)

The amperage for the 230 volt air conditioner would not be 6 amperes on Line A and Line B if connected to a 240 volt system. Same with the 115 volt rated air conditioner and 115 volt rated disposer if connected to 120 volts.

The correct load balancing of this example would be:

The sketch shows the connections of the appliances in Example No. D1(b).

Insert Artwork Here

The 230 V air conditioner is rated 6 amperes @ 230 V. When connected to a 240 V supply the watts would be: R = E/I = 230 V/6 a = 38.3Ω. W = E^2/R = 240 V x 240 V/ 38.3Ω = 1504 watts. The sketch shows 1504 watts connected across Line A and Line B.

The 115 V air conditioner is rated 12 amperes @ 115 V. When connected to a 120 V supply the watts would be: R = E/I = 115 V/12 a = 9.58Ω. W = E^2/R = 120 V x 120 V/9.58Ω = 1503 watts. The sketch shows 1503 watts connected across Line A to neutral.

The 115 V disposer is rated 8 amperes @ 115 V. When connected to a 115 V supply the watts would be: R = E/I = 115 V/8 a = 14.4Ω. W = E^2/R = 120 V x 120 V/ 14.4Ω = 1000 watts. The sketch shows 1000 watts connected across Line B and neutral.

The 120 V dishwasher is rated 10 amps @ 120 V = 1200 watts. The sketch shows 1200 watts connected Line B to neutral.

LA = 1503 + 752 = 2255/120 V = 18.8 amperes
LB = 1000 + 1200 + 752 = 2952/120 V = 24.6 amperes
Total = 2255 + 2952 = 5207/240 V = 21.7 amperes
Neutral = 1503 + 1200 + 1000 = 3703/240 V = 15.4 amperes

By assuming the loads to be balanced and dividing the total power by the line voltage, the total neutral current equals 15.4 amperes. For more exact results for an unbalanced system, calculate the neutral load by the largest line to neutral total 2200 watts divided by the line to neutral voltage of 120, equals 18.3 amperes or 2.9 amperes higher.

So the maximum neutral current as connected would be if the line B load was off. The line one to neutral current would be the maximum 18.3 amperes.

• The largest motor is the 12 ampere @ 115 V air conditioner. When connected to a 120 V supply the amperage would be: R = E/I = 115 V/12 a = 9.58Ω. I= 120 V/9.58Ω = 12.52 amperes x 25% = 3.13 amperes would be added to Line A and neutral.

The correct answer to the Example is:

Line A = *78 a + 21.7 a + 3.1 (largest motor) = 102.8 or 103 a.
Line B = *78 a + 21.7 a = 99.7 or 100 a.
Neutral = *61 a + 18.3 a = 79 a.

Panel Meeting Action: Reject

Panel Statement:

The calculations are consistent with the requirements of Article 220.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

2-365 Log #1312 NEC-P02 **Final Action: Accept**
(Annex D)

Submitter: National Electrical Code Technical Correlating Committee
Recommendation:

[Text of Proposal 2-365 recommendation is shown on page 2066]

Substantiation:

This proposal and several others related to Article 220 were developed under the guidance of the NFPA Task Group on Usability. Several sub-task groups were formed to evaluate the need for a re-organization of Article 220 and to determine were editorial revisions would enhance the usability of the article. This proposal is the result of an effort by the NEC Usability Task Group to standardize the language throughout the NEC relative to the use of the terms computed and calculated. The term "calculate" and its derivatives is presently used in the article title, section titles, and throughout portions of the existing article. Other Articles of the NEC such as for calculating conductor ampacties (under engineering supervision), calculating the size of enclosures, and in Annex D use the term calculate. Additionally, the term "calculate" is more commonly used in other NFPA codes and standards e.g. NFPA 70E, arc flash calculation. Adversely, the term "computation" has a connotation of using a computer, although "load calculations" are frequently determined using a calculator. It appears that the term "computation" was used more frequently beginning with the 1975 NEC based on an editorial revision project.

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

2-366 Log #3055 NEC-P02 **Final Action: Reject**
(Annex D, Example D-2(A))

Submitter: Gerald M. Cobb, M. Davis & Sons Inc.
Recommendation:

Same as below.
Load calculations should be changed for single family dwellings.

Substantiation:

Restructure the load calculation for a single family dwelling over 1500 sq. ft. Should only need Min. 150 amp service, 30 circuit, 2300 sq. ft, 42 circuits, 200 amp minimum.
Panel Meeting Action: Reject
Panel Statement:

The proposal does not comply with 4-3.3(C) of the Regulations Governing Committee Projects in that it does not provide any recommended text.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

2-367 Log #1313 NEC-P02 **Final Action: Accept**
(Annex D, Example D3A (new))

Submitter: National Electrical Code Technical Correlating Committee
Recommendation:

[Text of Proposal 2-367 recommendation is shown on page 2068]

Substantiation:

This proposal and several others related to Article 220 were developed under the guidance of the NFPA Task Group on Usability. Several sub-task groups were formed to evaluate the need for a re-organization of Article 220 and to determine were editorial revisions would enhance the usability of the article. This Proposal provides a new example that will greatly enhance code usability by providing actual integration of rules covering continuous/noncontinuous loading, terminations, ampacity conditions, and environmental influences. The present Example D3 opens this slightly, but does not cover 3-phase industrial systems and the complexities inherent when considering ambient temperature and mutual conductor heating in the context of other rules.

The key to the new approach is to clearly set off the rules that follow from the effects of heating in the interior of a raceway or cable assembly, and which are solely intended to protect the integrity of the insulation, from those that apply at terminations. Termination rules have little to do with protecting conductor insulation and everything to do with assuring proper function of devices, many of which will not function properly absent a properly sized heat sink bolted to them.

In short, every conductor has both a middle and an end. Different thermodynamic considerations apply to each, even if certain derating factors may coincidentally be equal. For example, 80% may apply to continuous load profiles to assure appropriate termination performance, and the same percentage may apply to 6 current carrying conductors in a raceway. This is purely coincidental, as is obvious if one jumps to 9 such conductors. Nevertheless, there is widespread confusion on these points in the field.

Every Code Making Panel is faced with the dilemma of writing Code that is simple to read and apply, but that over design electrical installations and waste resources in the process, and writing technically correct Code that is more difficult to read and apply uniformly. One way to bridge this gap is through the judicious use of examples. This example fulfills that need.

The Task Group recommends that the TCC refer this proposal to CMP 1 for comment on aspects governed by 110.14(C); to CMP 11 for comment on aspects governed by 430.24; and to CMP 12 for comment on aspects governed by 630.11.

Panel Meeting Action: Accept
Panel Statement:

The chair of CMP-2 will review the example for accuracy. The panel notes that there is an incorrect reference to 250.32(2)(2) that should be changed to 250.32(B)(2) in the material on calculating the neutral conductor size.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

2-368 Log #3099 NEC-P02 **Final Action: Reject**
(Example D3A)

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

Recommendation:

[Text of Proposal 2-368 recommendation is shown on page 2069]

Substantiation:

This proposal is offered in an attempt to resolve an editorial difference of opinion within the NEC Usability Subcommittee on Article 220. The submitter was the task group chair within that subcommittee charged with developing this example. It is identical (save for a one ampere variation in one portion due to rounding differences) to the version submitted by the majority of the Subcommittee under Technical Correlating Committee auspices, with one major exception. This version converts the calculations from volt-amperes to amperes much earlier in the process. The submitter, outvoted in the Article 220 Subcommittee, believes this will enhance its usability for and connection with its intended audience. Most electricians, including this submitter, have no intuitive feel for volt-amperes. On the other hand, when a result is given in amperes, relative wire sizes and the columns in Table 310.16 immediately jump to mind. Although the majority approach is consistent with most other Annex D examples, consistency is no virtue in this case. Unlike the other examples, the focus of this example is not about load calculations; it is about conductor selection. In reading through the other approach, the submitter found himself constantly trying to mentally divide by 831 in order to regain a sense of the currents (and potential conductors) involved.

The most important thing, however, is to get either this version or the Article 220 Subcommittee version into the next NEC. This approach (followed by either version of the proposed example) is based on a series of articles the submitter wrote for EC&M Magazine, and which are now further developed in Chapter 26 of Practical Electrical Wiring. This example will greatly enhance code usability by providing actual integration of rules covering continuous/noncontinuous loading, termination, ampacity conditions, and environmental influences. The present Example D3 opens this slightly, but does not cover 3-phase industrial systems and the complexities inherent when considering ambient temperature and mutual conductor heating in the context of other rules. The Usability Task Group on Article 220 identified this approach as crucial to clear up extensive field misunderstanding of requirements. CMP 2 need only look to the Proposal 2-244/Comment 2-129 issues in the prior cycle to see how easy it is to lose one's way in this area, and the topic continually arises in seminars.

The key to this example is to clearly set off the rules that follow from the effects of heating in the interior of a raceway or cable assembly, and which are solely intended to protect the integrity of the insulation, from those that apply at terminations. Termination rules have little to do with protecting conductor insulation and everything to do with assuring proper function of devices, many of which will not function properly absent a properly sized heat sink bolted to them.

In short, every conductor has both a middle and an end. Different thermodynamic considerations apply to each, even if certain derating factors may coincidentally be equal. For example, 80% may apply to continuous load profiles to assure appropriate termination performance, and the same percentage may apply to 6 current carrying conductors in a raceway. This is purely coincidental, as is obvious if one jumps to 9 such conductors. Nevertheless, there is widespread confusion on these points in the field.

Every Code Making Panel is faced with the dilemma of writing Code that is simple to read and apply, but that over-designs electrical installations and wastes resources in the process, and writing technically correct Code that is more difficult to read and apply uniformly. In this area CMP 2 has been consistent, over the past six code cycles (ever since the 1987 NEC), in constantly moving in the direction of what was technical correct instead of simplistic over-design. With this example, the industry may finally be worthy of the compliment CMP 2 has been trying to pay it these many years.

The submitter understands that the Technical Correlating Committee will likely refer this proposal to Code-Making Panel1 for comment on aspects governed by 110.14(C); to CMP 11 for comment on aspects governed by 430.24; and to CMP 12 for comment on aspects governed by 630.11.

Panel Meeting Action: Reject

Panel Statement:

The panel prefers the version in Proposal 2-367 (Log #1313).

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

2-369 Log #211 NEC-P02 **Final Action: Reject**
(Example D 5 (a))

Submitter: Tom Henry, Code Electrical Classes, Inc.

Recommendation:

Rewrite the answer to Example D5(a) as 23,000 watts and not 34,500 watts.

Substantiation:

I disagree with the calculation in Example D5(a) and the following is why.

Section 220.19 states: "Where two or more 1ø ranges are supplied by a 3ø, 4-wire feeder, the total load shall be computed on the basis of twice the maximum number connected between any two phases".

The above section should have included the word WYE. 1ø ranges supplied by a 3ø, 4-wire feeder...

A 3ø, 4-wire connected delta the 1ø ranges would connect on only one phase, with a WYE connected feeder the 1ø ranges connect between two phases.

Insert Artwork Here

On a delta the 1ø range connects on "B" phase in the picture above, it could connect on "A" phase or "C" phase. The point being, it connects only on one phase, either "A", "B", or "C".

On a wye the 1ø range connects between "B" phase and "C" phase, it also could be connected between "A" phase and "B" phase or between "A" phase and "C" phase. The point being, it can only connect between two phases on a wye.

Chapter 9 Example D5(A) shows a calculation for ten 12 kW single-phase ranges on a three-phase 4-wire feeder, the calculation is asking the minimum size feeder.

The first step is to find the best balance of these 10 ranges per phase:

A PHASE	B PHASE	C PHASE
4 ranges	3 ranges	3 ranges

Section 220.19 states the total load shall be computed on the basis of twice the maximum number connected between any two phases.

Take the largest number of ranges on one phase (A phase has 4 ranges) times the number of connections (two). 4 ranges connecting between 2 phases = 8 ranges. This is the advantage of a 3ø over a 1ø system, instead of calculating the demand from Table 220.19 for ten ranges at 25 kW you only have to include a demand of 23 kW for eight ranges.

Insert Artwork Here

The total connected (nameplate) for ten 12 kW ranges would be 10 x 12 kW = 120 kW connected load as shown in the sketch below. Each 12 kW range divides 6 kW between two phases. Phase "A" has a total of 42 kW connected load, Phase "B" has a total of 42 kW connected load and Phase "C" has a total connected load of 36 kW. 42 kW + 42 kW + 36 kW = 120 kW total connected.

Section 220.19 permits a demand (reduction) to this 120 kW. 220.19 states the TOTAL LOAD shall be computed on the basis of twice the maximum number connected between any two phases (which is 4 ranges x 2 = 8 ranges). The TOTAL LOAD is based on 8 - 12 kW ranges. Table 220.19 Column C permits a demand (reduction) from the nameplate of 120 kW down to 23 kW.

The reason I disagree with the calculation in Chapter 9 Example D5(a) is, using the format it shows taking the per phase demand of 23 kW and dividing by 2 = 11,500 VA x 3 = 34,500 VA. Where in Section 220.19 does it say to divide Column C by 2 and then times 3 for an equivalent 3ø load?

The TOTAL LOAD for 8 - 12 kW ranges is 23 kW! The per phase demand would be 23 kW divided by 3 = 7666 w per phase.

To make it easier to understand let's calculate it in current. 10 ranges cannot be perfectly balanced in the 3 phases; 9 ranges could, but not 10 ranges. With 10 ranges "A" phase has 42 kW/120 V = 350 amps. "B" phase has 42 kW/120 V = 350 amps. "C" phase has 36 kW/120 V = 300 amperes.

120 kW perfectly balanced between 3 phases = 40 kW per phase. 40 kW/120 V = 333 amperes.

Insert Artwork Here

The 23000 w/120 V = 7666 w per phase demand load. To make a long story short, follow the format in Example D5(a) and use the connected load of 120 kW 1ø on a 3ø system. Take 120 kW (instead of 23 kW) and divide by 2 as they did in Example D5(a) = 60 kW x 3 phases = 180 kW.

With this format they are saying 180 kW is an equivalent 3ø load for a nameplate connected load of 120 kW?

Insert Artwork Here

The correct calculation is 23,000 w/208 V x 1.732 = 63.8 amperes demand on the feeder wire. Or 7666 w per phase/120 phase volts = 63.8 amperes demand per phase. In a wye connected transformer feeder line amperes are equal to phase amperes.

Don't use Table 220.19 demand and calculate the amperage at nameplate 120,000 w/208 V x 1.732 = 333 amperes per feeder on a balanced system. With the system being unbalanced the current would be: Phase "A" = 42,000 w/120 V = 350 amperes. Phase "B" 42,000 w/120 V = 350 amperes. Phase "C" 36,000 w/120V = 300 amperes.

The format used in Example D5(a) would require 180,000 w/208 V x 1.732 = 500 amps on a feeder on a balanced system. 60,000 w/120 V = 500 amps per phase. This format would increase the wire size!

The advantage of putting single-phase ranges on a three-phase is given at the beginning when you reduce the 10 ranges to 8 ranges based on the 4 ranges per phase times 2 as they are connected between two phases on a wye. The Table 220.19 Column C demand for 8 ranges is 23 kW and this number of 23 kW is the TOTAL LOAD REQUIRED as per Section 220.19. The Example D5(a) format of dividing 23 kW by 2 and then times 3 makes no sense, the 23 kW should be divided by 3, for three phases.

My answer is to Example 5D(a) is 23,000 watts and not 34,500 watts as the Example shows. These four pages explain why!

Panel Meeting Action: Reject

Panel Statement:

The example is consistent with the requirements of Article 220.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

7-212a Log #CP702 NEC-P07 **Final Action: Accept**
(Annex E)

Submitter: Code-Making Panel 7

Recommendation:

Add the following to Annex E, following the table in the existing Annex.
The five different types of construction can be summarized briefly as follows:
Type I is a Fire-Resistive construction type. All structural elements and most interior elements are required to be noncombustible. Interior, nonbearing partitions are permitted to be 1 or 2 hour rated. For nearly all occupancy types, Type 1 construction can be of unlimited height.
Type II construction has 3 categories, Fire-Resistive, One-Hour Rated and Non-Rated. The number of stories permitted for multifamily dwellings vary from 2 for Non-Rated, and 4 for One-Hour Rated to 12 for Fire-Resistive construction.
Type III construction has two categories, One-Hour Rated and Non-Rated. Both categories require the structural framework and exterior walls to be of noncombustible material. One-Hour Rated construction requires all interior partitions to be one-hour rated. Non-Rated construction allows nonbearing interior partitions to be of non-rated construction. The maximum permitted number of stories for multifamily dwellings and other structures is 2 for Non-Rated and 4 for One-Hour Rated.
Type IV is a single construction category which provides for heavy timber construction. Both the structural framework and the exterior walls are required to be noncombustible except that wood members of certain minimum sizes are allowed. This construction type is seldom used for multifamily dwellings but, if used, would be permitted to be 4 stories high.
Type V construction has two categories, One-Hour Rated and Non-Rated. One-Hour Rated construction requires a minimum of one-hour rated construction throughout the building. Non-rated construction allows non rated interior partitions with certain restrictions. The maximum permitted number of stories for multifamily dwellings and other structures is 2 for Non-Rated and 3 for One-Hour Rated.

Insert Table Here

(Table shown on page 2732)

Substantiation:

The Technical Correlating Committee Usability Task Group has asked the panel to expand the explanation of various construction types.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14 Negative: 1

Explanation of Negative:

STANIERO: The proposal should be rejected and considered for acceptance when sufficient information is presented for a thorough technical review and discussion. The detail of the proposal was not reviewed or deliberated at the panel meeting. The panel accepted the concept of adding explanatory material to Annex E but were not provided with the text of the proposal. The text was prepared by Staff and made available to the panel after the panel meeting in the form of a letter ballot. The source of the information is not identified making it impossible to review for technical accuracy or for any conflicts with "the applicable building code" referenced in FPN No. 1 to 334.10(3). Additionally, my understanding is that the substantiation is not correct. The proposal was requested by a member of CMP-7, not by the Technical Correlating Committee.

Comment on Affirmative:

DALY: The substantiation is not correct, this proposal was developed by CMP-7 and not at the request of the Technical Correlating Committee Usability Task Group. The substantiation should read: "The explanation of the five different types of constructions is added to Annex E to provide the users with summary descriptions of the construction types and make the NEC more user friendly."
NICKSON: The panel statement needs clarification that Type NM cable be allowed an extra story if the building is sprinklered. Thus the four story limit for Types III and IV would be increased to five stories and Type V multifamily can go four stories if the building is sprinklered.

15-105 Log #1039 NEC-P15 **Final Action: Reject**
(Annex G)

Submitter: Joseph A. Tedesco Boston, MA

Recommendation:

Add a new Annex G to include the entire content of Chapter 4 for Electrical Systems, and Chapter 8 for Electrical Equipment from NFPA 99, Standard for Health Care Facilities, 2002 edition.
Add a FPN in Article 517 to call attention to this information.

Substantiation:

This is extremely important "electrical safety information" that should be added to the 2005 NEC.

Panel Meeting Action: Reject

Panel Statement:

Reprinting Chapters 4 and 8 as annex G would be redundant as there are numerous references to NFPA 99 throughout the text of Article 517. NFPA 99 is readily available.

Number Eligible to Vote: 12

Ballot Results: Affirmative: 12

6-120 Log #1500 NEC-P06 **Final Action: Reject**
(Annex G, Table G-1)

Submitter: Jeff Davies, Encompass Electrical Technologies, Rocky Mountain

Recommendation:

Annex G - Wire Type Letter Designations.
This Annex is not a part of the requirements of this NFPA document but is included for information purposes only.

Insert Table G.1 Here

(Table shown on page 2731)

Substantiation:

By having this added Annex, a person will be able to see exactly what each letter on the conductors listed in Table 310.13 represents. This will help in efficiency and accuracy.

Panel Meeting Action: Reject

Panel Statement:

The list contains errors and is not appropriate for inclusion in the Code, as the wire types and their definitions are included in Table 310.13.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11