ARTICLE 300 — WIRING METHODS

3-4 Log #665 NEC-P03 **Final Action: Reject**
(300)

Submitter: Farwell Perry, Farwell Perry Electric, Inc.
Comment on Proposal No: 2-110
Recommendation: Add text to read as follows:
All outdoor wire netting, splicing and screwing shall have grease applied where metal meets metal, to avoid corrosion and difficulty of disassembly.
Substantiation: None.
Panel Meeting Action: Reject
Panel Statement: The recommended text is dealing with outdoor wire netting, splicing, and screwing, and the proposal reference number is 2-110 and does not seem to apply to any particular proposal under the jurisdiction of Panel 3 for the ROP stage. There was no substantiation given to indicate a reason for a change in the Code. This comment does not comply with Section 4-4.5(d) of the NFPA Rules and Regulations Governing Committee Projects for providing a statement of the problem and substantiation for a change in the Code.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-5 Log #2374 NEC-P03 **Final Action: Reject**
(300.2(A))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 3-5
Recommendation: The Proposal should be Accepted in Principle and revised to read:
(A) Voltage. Wiring methods specified in Chapter 3 shall be used for 600 volts, nominal, or less where not specifically limited in some section of Chapter 3 or not permitted elsewhere in this Code. They shall be permitted for over 600 volts, nominal, where specifically permitted elsewhere in this *Code*.
Substantiation: I agree with the Panel in not accepting the words "permitted to be".
There are other uses permitted and uses not permitted for the 600 volt wiring methods in other than Chapter 3 Articles. For example, 590.4 permits NM cable to be used in structures of any height or building construction Type and 501.10(A) limits the permitted wiring methods.
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 the particular conditions."
Panel Meeting Action: Reject
Panel Statement: Since Chapters 5, 6, or 7 can supplement or modify the requirements in Chapters 1 through 4, this additional text in 300.2(A) is not necessary. Any modification of these general rules that occur within these later chapters is specifically covered in that particular special condition, installation, or application. Because 90.3 provides for this, repeating it here does not add value. Panel statement for ROP rejection is still valid.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-6 Log #2375 NEC-P03 **Final Action: Reject**
(300.3(B)(1))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 3-11
Recommendation: The Proposal should have been Accepted in Principle and the last sentence revised to read:
Parallel runs in cable tray shall comply with the provisions of 392.8(D) and, where applicable, 392.8(E).
Substantiation: While 300.3(B)(1) is titled "Paralleled Installations", it references "conductors" which are normally single conductors. When parallel runs of single conductors are installed in cable tray, the requirements of 392.8(D) and (E) both apply. 392.8(E) specifies the requirements for single conductors in cable tray.
The Panel Statement refers to single paralleled conductors installed in cable tray, in which case, 392.8(E) would apply in addition to 392.8(D).
Panel Meeting Action: Reject
Panel Statement: Section 392.8(D) is the main section that deals with paralleled circuits in cable trays. This section requires parallel circuits to be grouped together and securely bound in order to minimize inductive reactances. To add the suggested reference to 392.8(E) may confuse the user, since this section requires single conductors to be installed in layers and would appear to alter the requirements of the previous section.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-7 Log #9 NEC-P03 **Final Action: Reject**
(300.3(C)(1), FPN)

Submitter: Greg Presti, Fru-Con Engineering
Comment on Proposal No: 3-13
Recommendation: Right now 300-3(C)(1) FPN reads:
"See Section 725-54(A)(1) for Class 2 and Class 3 circuit conductors."
I would like to suggest that a sentence is added to 300-3(C)(1) FPN to read:
"See 725-26(B) for Class 1 circuit conductors."
Substantiation: Confusion may result from the rules of 300-3(C)(1) due to the fact that 725-26(B) prohibits Class 1 circuits not functionally associated from occupying the same raceway as power circuits regardless of whether all cables have 600V insulation. Attention should be brought to 725.26(B) in the FPN in order to clarify this matter.
Panel Meeting Action: Reject
Panel Statement: Section 300(C)(1) is the general rule that allows conductors to share the same raceway as long as the insulation ratings of the conductors are equal to the maximum voltage applied to any one conductor. The fine print note was included to alert the user of the Code to look in Section 725.54 when dealing with Class 2 and Class 3 conductors. Class 2 and Class 3 conductors are treated differently and require barriers or separation to co-exist with general lighting, power, and Class 1 circuit conductors rather than insulation. The additional reference suggested to the (C)(1) FPN is unnecessary and may send the wrong message that Class 1, Class 2, and Class 3 circuits are similar.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-8 Log #1277 NEC-P03 **Final Action: Reject**
(300.4)

Submitter: Samuel Morgan, Protective Electrical Cover Corporation
Comment on Proposal No: 3-14
Recommendation: Protective electrical restricter cover will prevent all damage which is presently being done to wiring inside all electrical junction boxes, during the construction stage, in all buildings.
Substantiation: The protective electrical restrictor cover was designed to prevent a router which is operated inside junction boxes, and accidently cuts and nicks wiring, from making any contact with the wires placed inside the junction box by the electrician during construction of a building.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any specific recommendation for a text change as required by Section 4-4.5(d) of the NFPA Rules and Regulations Governing Committee Projects.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been accepted.
Wires being nicked in the outlet boxes by routers is becoming one of the biggest problems for electricians, contractors, and inspectors alike. These nicks can go undetected and pose serious problems at a future time. These problems can be anything from fire to shock and even electrocution. This may be a building code issue, but this problem needs to be addressed and sometime soon.

3-9 Log #2376 NEC-P03 **Final Action: Accept**
(300.4)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 3-14
Recommendation: The Proposal should be Accepted in Principle and "adequately" deleted from the first sentence so it reads:
Where subject to physical damage, conductors shall be ~~adequately~~ protected.
Substantiation: 3.2.1 of the NEC Style Manual states that "The NEC shall not contain references or requirements that are unenforceable or vague." Table 3.2.1 of the Style Manual lists "adequate" as a possibly unenforceable or vague term.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-10 Log #403 NEC-P03 **Final Action: Reject**
(300.4(A)(1))

Submitter: James M. Long, JML Electrical Contracting
Comment on Proposal No: 3-32
Recommendation: Delete the word "bored".
Substantiation: The deletion of "bored" from this section will permit the running of nonmetallic cable, AC cable and other cables through prepunched or established holes in manufactured floor joist systems.
Panel Meeting Action: Reject

Panel Statement: The title of 300.4(A) is Cables and Raceways Through Wood Members, not in pre-punched holes or established holes in metal floor joist systems, as would seem to be the intent of the submitter. If the floor joists were made of wood and the holes drilled by the manufacturer, the text in 300.4(A)(1) would apply without changing the text, since the manufacturer would have "bored" the holes.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-11 Log #2414 NEC-P03 **Final Action: Reject**
(300.4(A)(1) Exception)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 3-23
Recommendation: Revise the existing Exception in the 2002 NEC as follows:
Exception: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, ~~or~~ electrical metallic tubing or interlocked armor Type AC and MC cables.
Substantiation: The Fact Finding Study by Underwriters Laboratories on "Nail Penetration of Types AC and MC Cable Installed Parallel to Framing Members" proves conclusively that interlocked armor type AC and MC cables perform better than EMT and PVC conduits in providing protection from physical damage from nails and screws. This Fact Finding Study was furnished with the Proposal and is attached to this Comment for your convenience.
A summary of the Fact Finding Study follows. Note that the corrugated aluminum armored cable product is excluded as it is not proposed to be included in the Exception.Metal-clad cables with corrugated armor were the only type of cable that performed worse than EMT and RNC. This Comment proposes to exclude metal-clad cables having corrugated armors and thus correlate directly with the Fact Finding Study.
All of the cables proposed for the exception performed better than EMT and RNC. Since EMT and RNC are exempted from nail plate requirements, this Comment should be accepted so the appropriate Type AC and MC cables have equal and fair treatment. If the Panel disagrees with accepting this Comment, the Panel should remove EMT and RNC from the exception.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The requirement in the present text provides the additional protection that is needed for these cables.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
GUIDA: The Panel did not take due consideration of the factors in the UL Fact Finding Report detailing the penetration and damage statistics for Type AC Steel Interlocked Cable and Type MC Steel Interlocked Cable. With two hundred tests accomplished in the Fact Finding Report on Type AC Steel Interlocked Cable, Type MC Steel Interlocked Cable, Electrical Metallic Tubing (EMT), and Rigid Nonmetallic Conduit (RNC), there was no penetration or damage of the cables with drywall nails. The steel Type AC cable had a 1.5% penetration and damage with steel MC cable having a slightly higher damage and penetration rate with drywall screws. Both of the damage and penetration rates were much lower for the two steel interlocked cable types than for the EMT and RNC.

3-12 Log #2415 NEC-P03 **Final Action: Reject**
(300.4(A)(2) Exception)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 3-26
Recommendation: Revise the existing Exception in the 2002 NEC as follows:
Exception: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, ~~or~~ electrical metallic tubing or interlocked armor Type AC and MC cables.
Substantiation: The Fact Finding Study by Underwriters Laboratories on "Nail Penetration of Types AC and MC Cable Installed Parallel to Framing Members" proves conclusively that interlocked armor type AC and MC cables perform better than EMT and PVC conduits in providing protection from physical damage from nails and screws. This Fact Finding Study was furnished with the Proposal and is attached to this Comment for your convenience.
A summary of the Fact Finding Study follows. Note that the corrugated aluminum armored cable product is excluded as it is not proposed to be included in the Exception. Insert Table 70_Log2415 Here Metal-clad cables with corrugated armor were the only type of cable that performed worse than EMT and RNC. This Comment proposes to exclude metal-clad cables having corrugated armors and thus correlate directly with the Fact Finding Study.
All of the cables proposed for the exception performed better than EMT and RNC. Since EMT and RNC are exempted from nail plate requirements, this Comment should be accepted so the appropriate Type AC and MC cables have equal and fair treatment. If the Panel disagrees with accepting this Comment, the Panel should remove EMT and RNC from the exception.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-11.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
GUIDA: See my explanation of negative vote on comment 3-11.

(3-11 Log #2414)

Wiring Methods	Penetrations and Damage				Total And %
	Nails		Drywall Screws		
	Penetrate	Damage	Penetrate	Damage	
Type AC AL Interlocked Armor (201 tests performed)	2	7	1	11	21 10%
Type AC Steel Interlocked Armor (200 tests performed)	0	0	0	3	3 1.5%
Type MC Steel Interlocked Armor (200 tests performed)	0	0	3	4	7 3.5%
Electrical Metallic Tubing (198 tests performed)	0	0	17	9	26 13%
Rigid Nonmetallic Conduit (200 tests performed)	5	80	33	11	129 65%

(3-12 Log #2415)

Wiring Methods	Penetrations and Damage				Total And %
	Nails		Drywall Screws		
	Penetrate	Damage	Penetrate	Damage	
Type AC AL Interlocked Armor (201 tests performed)	2	7	1	11	21 10%
Type AC Steel Interlocked Armor (200 tests performed)	0	0	0	3	3 1.5%
Type MC Steel Interlocked Armor (200 tests performed)	0	0	3	4	7 3.5%
Electrical Metallic Tubing (198 tests performed)	0	0	17	9	26 13%
Rigid Nonmetallic Conduit (200 tests performed)	5	80	33	11	129 65%

3-13 Log #2173 NEC-P03 **Final Action: Accept in Principle**
(300.5)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 3-35
Recommendation: Reject the proposal, or, if you just have to do something, accept the panel action in principle. Amend 680.23(B)(2) by adding a third lettered paragraph as follows:
(c) Burial Depth. Rigid nonmetallic conduit extending to a forming shell shall, except where rising at terminations, have a minimum burial depth of not less than 450 mm (18 in.)
Substantiation: This is a classic example of what should be a Chapter 6 provision, amending the normal requirements in Chapter 3. Column 5 in Table 300.5 already has the most unwieldy column title in the entire NEC, and if this rule stays where it is, NFPA staff will have a whole new formatting challenge just getting it on the page. This is the antithesis of user-friendliness. Installers looking for special requirements for raceways for swimming pool equipment look in Article 680, not 300. This is why 680.10 has its own burial table. The wording in this comment provides the editorial framework and appropriate location for the requirement.
However, it may be preferable to just reject the proposal. The installation cited violated 300.5 anyway, since the cover depths for a wet-niche luminaire raceway are unamended at this time in Article 680. There was no substantiation that the burial depth for such circuits in 300.5 are inadequate. This comment applies a minimum depth of 18 in. for RNC, which countermands the normal allowance in Table 300.5 for residential GFCIs and landscape lighting, but does not change the depth for rigid metal conduit. CMP 17 has the expertise to address this question comprehensively. A companion comment has been placed on the agenda of CMP 17 for action in Article 680.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-15.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-14 Log #3242 NEC-P03 **Final Action: Reject**
(300.5)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-37
Recommendation: This Panel should have accepted this proposal.
Substantiation: We agree with the panel on the statement. "The first method of protection should be prevention", but an accident can still occur even after a location determination has been completed. A backhoe will damage PVC with the slightest contact and lack of warning ribbon results in the backhoe scraping until contact is made. Table 300.5 provides a burial depth of 24" at the time of installation. Construction work done at a later date will often expose the conductor at less than minimum depths due to landscape alteration and erosion control, again leaving the excavator to believe that 24 inches of cover exists, thus making accidental contact. A burial ribbon would warn of impending contact at any depth.
Finally, the panel does not address the concern for a person digging with a shovel, or a posthole digger where an even greater hazard exists when contact is made. The panel assumes that all excavations are accomplished through a trained, knowledgeable construction worker. Concern for the general public also needs to be addressed.
This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.
Panel Meeting Action: Reject
Panel Statement: The submitter did not provide any substantiation that service conductors installed in nonmetallic raceways have been damaged on a frequent basis. The existing text to 300.5(D)(3) relates only to providing warning ribbons above direct buried service conductors.
Direct buried service conductors are much more easily damaged, even when the operator is scratching the surface of the trench to locate the conductors, than when the conductors are installed in a raceway. A backhoe operator can damage any raceway system if the operator is not paying attention and has no idea that anything is buried below.
All utility companies have a service that will mark the ground directly above the service conductors, whether the conductors are directly buried or not, so anyone digging in that area will be less likely to damage their conductors. Where someone is digging with a shovel or a posthole digger, a nonmetallic raceway is not very easily damaged with the shovel or posthole digger bouncing off the raceway.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been accepted.
The submitter has valid concerns. Available fault current should be taken into consideration when addressing this issue of warning ribbons.
As mentioned in the panel statement, a backhoe operator can damage any raceway system if the operator is not paying attention and has no idea that anything is buried below. The warning ribbon is the first indication that something is buried below and could also save his life.

3-15 Log #3588 NEC-P03 **Final Action: Accept**
(300.5)

Submitter: Don W. Jhonson, ESP of South Florida, Inc.
Comment on Proposal No: 3-35
Recommendation: The panel should reject this proposal and refer the submitter to 680.10.
Substantiation: Article 680.10 addresses underground wiring location in pool areas. For burial depths, see Table 680.10. Table 300.5 does not apply to pool areas.
Panel Meeting Action: Accept
Panel Statement: The scope of this proposal is outside the jurisdiction of CMP 3 and should be acted upon by CMP 17, since they have jurisdiction and expertise over pools. The burial depths for luminaires, regardless of voltage, are specified in 680.23(A)(5). Burial depths for underground wiring supplying pool lighting are also found in the Article 680. It is not necessary to add the additional phrase to the column. Adding this information to Article 300 would add confusion to the user, since Article 680 deals with all information necessary for pool wiring.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-16 Log #1116 NEC-P03 **Final Action: Reject**
(300.5(D)(3))

Submitter: Paul Dobrowsky Holley, NY
Comment on Proposal No: 3-44
Recommendation: Accept the proposal.
Substantiation: Seeing a ribbon before digging into any buried conductor seams like a great safety measure. If seeing too many ribbons causes one to ignore them then many other safety devices should be reduced. It is true that service conductors only have overload protection. But when "digging through" any conductor it unlikely that an effective fault path will be established which will not open or operate the overcurrent device. What if the conductors are installed as a tap such as the outside taps of unlimited length provision in 240.21(B)(5)?
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-14.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: See my explanation of negative vote on Comment 3-14.

3-17 Log #3243 NEC-P03 **Final Action: Reject**
(300.5(D)(3))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-44
Recommendation: This Panel should have accepted this proposal.
Substantiation: The submitter is accurate in his statement that branch circuits and feeders pose a hazard. The panel is in agreement with this fact based on their statement "Service conductors are not protected by overcurrent devices and constitute a much greater hazard."
We disagree with the panel statement that the expanded use of safety items (warning ribbons) would desensitize them to these hazards. Any type of warning device that eliminates a hazard, extra work and the cost of repair would be valid in its use.
The panel further presents their statement with the opinion that this hazard only exists to trained users of the NEC, with no regard to the general public or homeowner.
This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.
Panel Meeting Action: Reject
Panel Statement: Warning ribbon or tape does not apply to feeders and branch circuits because these circuits contain short-circuit protection and service conductors do not. As such, the hazard associated with excavating these types of conductors is not as great. It would be an excessive requirement to require warning ribbon or tape above all branch circuits and feeders buried 18 inches or more.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: See my explanation of negative vote on Comment 3-14.

3-18 Log #2533 NEC-P03 **Final Action: Reject**
(300.5(D)(5))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 3-46
Recommendation: Revise the proposal and text as follows:
(5) Listing.
(a) Wet Locations. Cables and insulated conductors installed in enclosures or raceways in underground installations shall be listed for use in wet locations.
(b) Raceways and Sleeves.
1. Raceways that are installed as a complete run in accordance with 300.18(A) shall be listed when used with direct burial cable or conductors.
2. A sleeve of metric designator 155 (trade size 6) or less that is used with direct burial cables or conductors shall be made from a listed raceway.
Substantiation: Proposal 3-46 should be accepted with the revised text. The proposal and comment adds clarity concerning the use of listed raceways regardless of whether cables or conductors are suitable for direct burial and that sleeves used to enclose cables and wires should be from listed raceways when possible to eliminate possible damage from non-approved raceways.
There are no requirements on sleeves made from non-listed raceways, water pipe, concrete ducts, etc., including what they should be made of and the integrity of the interior to prevent damage when conductors and cables are being pulled or pushed.
Panel Meeting Action: Reject
Panel Statement: The submitter has not provided any additional technical information for requiring sleeves to be made from listed raceways. Direct burial cables and conductors are acceptable to be installed directly buried in the ground without protection. There have been no data submitted that direct buried cables and conductors are being damaged by insertion into a sleeve or chase under a driveway or similar obstruction.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
CASPARRO: This comment should have been accepted.
Direct buried cables are listed to be installed in direct contact with earth. Cables of this type are typically laid in open trenches with consideration given to soil conditions so as not to risk physical damage to the installed cable. The risk of physical damage to this cable type is greatly increased where the cable is pulled through a sleeve that is not listed for the purpose. There is a possibility that the outer jacket of the cable could be damaged due to rough or sharp edges that may exist on the inner surface of the unlisted sleeve. Also there are no requirements for reaming sleeves that are not listed as a raceway creating a further risk of physical damage to the direct buried cable where it enters and leaves the sleeve.
Requiring the use of a listed raceway would eliminate these hazards.
EASTER: NEMA is voting negative on the panel action. Cables listed for direct burial are tested for crush and impact resistance. They are not tested for the abrasion or cut-through resistance that cables are subject to when pulled through non-listed raceways. Listed raceways are designed, manufactured and inspected to ensure there are no sharp edges or projections on the interior of the raceway in accordance with the requirements of their listing. Common water, sewer or other pipes have no such requirement and subject the cables and wires to damage.

3-19 Log #3241 NEC-P03 **Final Action: Reject**
(300.5(D)(5))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-46
Recommendation: This Panel should have accepted this proposal.
Substantiation: Direct buried cables are listed to be installed in direct contact with earth. Cables of this type are typically laid in open trenches with consideration given to soil conditions so as not to risk physical damage to the installed cable. The risk of physical damage to this cable type is greatly increased where the cable is pulled through a sleeve that is not listed for the purpose. There is a possibility that the outer jacket of the cable could be damaged due to rough or sharp edges that may exist on the inner surface of the unlisted sleeve. Also there are no requirements for reaming sleeves that are not listed as a raceway creating a further risk of physical damage to the Direct Buried Cable where it enters and leaves the sleeve.
Requiring the use of a Listed Raceway would eliminate these hazards. Panel 3 should give further consideration to this proposal. We agree with the Negative Vote of Mr. Easter that the proposal would add clarity and improve the application of this installation.
This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 3-18.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
CASPARRO: See my explanation of negative vote on Comment 3-18.
EASTER: See my explanation of negative vote on Comment 3-18.

3-20 Log #1117 NEC-P03 **Final Action: Reject**
(300.5(G))

Submitter: Paul Dobrowsky Holley, NY
Comment on Proposal No: 3-47
Recommendation: Accept the proposal in principle and in part by additionally changing the term "may" to "can".
Substantiation: The term "may" should "only be used where it recognizes discretionary judgment on the part of an authority having jurisdiction" according to 3.1.2 of the NEC Style Manual.
Panel Meeting Action: Reject
Panel Statement: Section 3.2.1 of the NEC MOS allows discretionary use of "can" and "may" when not used in the context of AHJ enforcement. The panel reaffirms original action on the proposal.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-21 Log #2903 NEC-P03 **Final Action: Reject**
(300.5(K))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 3-50
Recommendation: Accept this proposal with the following revision to the submitters proposed text:
(K) Direction Boring. Cables or raceways installed using directional boring equipment shall be listed and approved for the purpose.
Substantiation: The proposed revision indicates that the cables and raceways are required to be listed and approved for the purpose. This will prohibit non-listed raceways that are approved for directional drilling from being used.
Panel Meeting Action: Reject
Panel Statement: The submitter has yet to provide any substantiation that listing products specifically for directional boring is necessary and that a problem exists where installing cables or conduit in this method.
The panel concludes that "approved for the purpose" in this section is specifically for the purpose of directional boring applications.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been accepted.
It would be very difficult, if not impossible, for an electrical inspector to evaluate a product of this type for suitability of installation and use. Listed Directional Boring Raceways are available and should be required to ensure that the raceway and the installed conductors are not damaged during installation.

3-22 Log #3244 NEC-P03 **Final Action: Reject**
(300.5(K))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-50
Recommendation: This Panel should have accepted this proposal.
Substantiation: To replace approved with listed, alleviates the authority having jurisdiction from making uninformed, difficult decisions as the panel statement suggests. The panel statement shows agreement with the submitter on the difficulty in making an informed and safe inspection, yet disagrees with the proposal without merit. Using listed raceways would ensure the materials involved are capable of withstanding the environment being introduced, when installed "as listed". The panel statement points out the need for further information, yet does nothing to promote it.
This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 3-21.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been accepted.
See my explanation of negative vote on Comment 3-21.

3-23 Log #151 NEC-P03 **Final Action: Reject**
(300.6)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 3-51
Recommendation: Add to the beginning of (A) "Where exposed to moisture or corrosive substances," and change "Ferrous ~~metal~~" to "metal".
Substantiation: Nonferrous equipment can be metal or nonmetallic, but ferrous can only be metal. The gratuitous word certainly is not worth fussing about, except that I have substantive change to suggest, anyway.
The term "suitably" has been removed, and the phrase "Where corrosion protection is necessary" strongly suggests that "suitably protected" did not mean requiring protection where there is no reason to expect deterioration. Still, "suitably protected" is rather vague; the phrase I propose specifies where protection is called for.
Panel Meeting Action: Reject
Panel Statement: The panel rejects Comment 3-23 to change "ferrous metal" to "metal." The word "ferrous" was retained, since "ferrous" describes metal raceways composed of iron or containing some amounts of iron. Subsection (B) of the panel action covers non-ferrous metal equipment, such as aluminum and similar metals not containing iron. In addition, there are other sources of corrosion.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-24 Log #978 NEC-P03 **Final Action: Accept**
(300.6)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 3-51
Recommendation: The panel should not have accepted requiring a "listed" compound for all field threads nor should the panel have accepted requiring all field threads to be coated.
Substantiation: No substantiation has been provided by the submitter to show there is a problem with using Non-Listed products. "Listed" products may be approved, but there is no justification to require "listed" only. The panel should not have accepted requiring compound applied to all field threads. This will include those not subject to corrosion and, therefore, where no protection is needed. No substantiation has been given to require applying the compound for areas that are not subject to corrosion. The panel statement for action taken on Proposal 3-55 is "there has been no substantiation to justify requiring all threads for all raceways, including those raceways with factory galvanizing or other corrosion protection, to be recoated before installation". This applies here as well.
Panel Meeting Action: Accept
Panel Statement: No substantiation was provided to show that "non-listed" compounds are a problem. "Listed" products may be approved for use, but there is no justification to require "listed" products only.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
CASPARRO: This comment should have been rejected.
This proposal was originally accepted by an 11 - 1 margin in the ROP stage. At the ROC stage, the decision was reversed by an 8 - 5 vote. Listed compounds for field cut threads are available and should be used, making it easer for inspectors to verify that the proper compounds are being used.
OWEN, R.: Listing of a compound makes it simple for the authority having jurisdiction to determine whether the compound is adequate for the task. An inspector does not have a testing laboratory in the trunk of his/her vehicle and this puts the responsibility on the AHJ as to whether to accept a product or not. There is a listed product available, so the mechanism for other manufacturers to get their product listed is already in place. Section 90.4 allows the AHJ to accept alternative products even if they are not listed.

3-25 Log #2174 NEC-P03 **Final Action: Accept in Principle in Part**
(300.6)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 3-51
Recommendation: Accept the panel action in principle. In 300.6(A), change "listed electrically conductive" to "identified electrically conductive." In 300.6(C)(1) revise to read: "Where exposed to sunlight, the materials shall be identified as sunlight resistant."
Substantiation: The panel is to be commended for excellent work on a complicated subject. The thread coating requirement is overkill, however. There are a number of anti-spall compounds that are identified by their manufacturers as suitable for thread treatment, and that should be sufficient. In the second case, a product listed as sunlight resistant would automatically qualify as identified for that purpose under the Article 100 definition, so spelling out both options is redundant.
Panel Meeting Action: Accept in Principle in Part
Panel Statement: The panel has accepted in principle, deleting the requirement for listing of thread compound and reverting back to "approved".
Panel did not accept the change in 300.6(C)(1), since the word "identified" is properly used in this context to require suitability of the material for sunlight resistance where listing may not be appropriate.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-26 Log #979 NEC-P03 **Final Action: Accept**
(300.6(A))

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 3-52
Recommendation: The panel should not have accepted requiring a "listed" compound for all field threads nor should the panel have accepted requiring all field threads to be coated.
Substantiation: No substantiation has been provided by the submitter to show there is a problem with using Non-Listed products. "Listed" products may be approved, but there is no justification to require "listed" only. the panel should not have accepted requiring compound applied to all field threads. This will include those not subject to corrosion and, therefore, where no protection is needed. No substantiation has been given to require applying the compound for areas that are not subject to corrosion. The panel statement for action taken on Proposal 3-55 is "There has been no substantiation to justify requiring all threads for all raceways, including those raceways with factory galvanizing or other corrosion protection, to be recoated before installation". This applies here as well.
Panel Meeting Action: Accept
Panel Statement: The panel has reviewed the original copy of the submitter's comment and observed that the word "not" was omitted inadvertantly by staff during transcription. See the submitter's recommendation in Comment 3-24.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been rejected.
See my explanation of negative vote on Comment 3-24.

3-27 Log #980 NEC-P03 **Final Action: Reject**
(300.6(A))

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 3-55
Recommendation: The proposed change from "open wiring" to "exposed" should have been accepted by the panel.
Substantiation: The reason for removing the term "open wiring" is that 1) it is undefined as opposed to the term "open wiring 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 uninsulated. The attempt here is to use the term "exposed" rather than "open wirng" which is better understood in the field. The change from "open wiring' 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.
Panel Meeting Action: Reject
Panel Statement: The term "open wiring" does not appear in this section.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-28 Log #2034 NEC-P03 **Final Action: Accept**
(300.6(A))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 3-51
Recommendation: Accept in Principle in Part
Change the last sentence in 300.6(A) as follows:
"Where corrosion protection is necessary and the conduit is threaded in the field,...".
Substantiation: The Steel Tube Institute submitted this proposal and call to the Panel's attention that we inadvertently omitted the words "where corrosion protection is necessary" in our original proposal. These words appear in the current 300.6 text and should be reinserted into the last sentence of 300.6(A) as shown above. We agree with Panel member Pace who states that there is no need to require that the compound be applied to all threads since there are installations where the threads would not be subjected to corrosive environments, such as indoor dry locations.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-28a Log #553 NEC-P03 **Final Action: Accept**
(300.6(C))

Note: The Technical Correlating Committee understands that the Panel Action for the Comment is to "Reject" Proposal 3-56 since there are specific locations, as indicated in the mandatory text, requiring fl in. spacing.
Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 3-56
Recommendation: 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.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the TCC.
Panel Statement: The purpose of listing these various locations is not to have a suggested laundry list of locations but to recognize by mandatory text that these particular locations must have a 6 mm (1/4 in.) gap to permit water and chemicals to drain and not accumulate on top of the raceways, boxes, or fittings where substantial deterioration can occur.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-29 Log #393 NEC-P03 **Final Action: Reject**
(300.11(C) Exception)

Note: The Technical Correlating Committee directs that this Comment be reported as "Reject" because no technical substantiation was provided by the submitter.
Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 3-69
Recommendation: Revise panel action:
Exception: Cables containing Class 2 or Class 3 circuit conductors that are solely for the connection to the control circuits of the equipment shall be permitted to be supported from Type AC, ~~or~~ Type MC, or Type MI cables used as the power supply conductors for the equipment.
Substantiation: Type MI cable should also be suitable for support.
Panel Meeting Action: Hold
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals. There was no technical substantiation or documentation submitted to support the submitters claim.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-30 Log #2862 NEC-P03 **Final Action: Accept**
(300.11(C) Exception)

Submitter: Christopher R. Pharo Marlton, NJ
Comment on Proposal No: 3-69
Recommendation: Reject this proposal.
Substantiation: The physical integrity of Type AC and MC cable has not been tested to carry other loads. This wiring method cannot mimic conduit with regards to support.
I would urge the panel to take the following account into consideration. A large AHU is fed with a MC cable from a MCC. Adjacent to this MCC is a building automated system with a data-gathering panel. This proposal will allow the installer to ty wrap class 2 and class 3 cables for the control of this AHU to the MC cable for its entire length. The number of cables can be in excess of 30.
This AHU described is already located in malls, schools, office buildings, universities, pharmaceutical plants, hospitals, etc. With the coming of age of digital control, this example depicted here is becoming the norm- not the exception.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-31 Log #3245 NEC-P03 **Final Action: Accept**
(300.11(C) Exception)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-69
Recommendation: This Panel should have rejected this proposal.
Substantiation: The Proposal contains no technical substantiation to warrant the inclusion of this exception. Merely stating the construction of Type AC and MC cables are "robust" for the intended application of this proposed exception is insufficient. No testing or review of the application has accompanied, nor been referred to in this proposal.
Furthermore, did the panel recognize that the requirements for supporting AC and MC cable allow for extended lengths without support, when connected to equipment. This allowance, coupled with the potentially unlimited additional weight of these Class 2 conductors could put excessive strain on connectors and fittings that are not currently accounted for when additional load is added. Mr. Casparro is correct in his statement that there are no limits to number and size of cables to be installed, therefore permitting unlimited weight and stress.
This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-32 Log #2175 NEC-P03 **Final Action: Accept**
(300.14)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 3-74
Recommendation: Continue to reject the proposal.
Substantiation: As a member of the CMP 9/CMP 3 task group (representing CMP 9) referred to in the panel statement, the submitter is in a position to provide additional technical information in support of the present rule. Consider a through-wired device box for a kitchen receptacle with Type NM cable as the wiring method. If rule were to apply where conductors emerge from the box (and this proposal is only 1 in. short of such a requirement), an installer would have to stuff approximately 5 feet of conductors into the box that also needs to accommodate the receptacle. This is because two 12-2 Type NM cables involve 6 conductors, including grounds (nothing in 300.14 excludes them from the requirement), times approximately 10 inches of wire equals 5 feet. The wire fill table [314.16(B)] was never intended to allow for this much volume, and if this proposal were accepted, CMP 9 would have to revisit and make substantial changes to the volume allowances in 314.16.
This has happened twice in the last forty years, once in 1975 when box volumes were found to be inaccurate and completely recalculated, and once in 1990 when the double device allowance took effect. Each time was very traumatic as installers had to make significant adjustments to their inventory and installation practices. CMP 9 is not interested in going through this process again if it can help it. Remember the rule in 300.14 is designed as a minimum to work the ends of a wire, and if a wire is too short for comfort in the future, it can be extended without penalty because wires that begin and end in the same box are not counted. This is also why the "out-of-the-box" part of the rule doesn't apply to boxes with large openings that you can get your hands into. For a conventional device box, 6 (or 5 as in the proposal) inches out of the box is plainly excessive. For deep boxes with extension rings, 6 inches from the point of conductor entry is too short. The rule agreed to by the task group splits the middle. It assures safe workability on the conductors after the box is installed, and it prevents excessive wire fill in the boxes at the time of initial installation.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-33 Log #461 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Kenneth L. Groves, Edwards Electric Corp.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with Proposal 1-109, Log 1403, and other actions by Code-Making Panel 3 and Code-Making Panel 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-34 Log #470 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: James G. DiLullo, Dynaelectric Company, Florida
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with Proposal 1-109, Log 1403 and other actions by Code-Making Panel 3 and Code-Making Panel 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

3-35 Log #507 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Vernon Jay Franke, Jr., Construction Consultants of Florida Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with Proposal 1-109 (Log 1403), and other actions by Code-Making Panels 3 and 9 to allow the use of handhole enclosures and to establish installation requirements in Articles 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-36 Log #680 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Ron Morgan, Florida Electric Contracting Service Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, and other actions by CMP 3 and CMP 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-37 Log #687 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Kevin J. Nuss, Florida Electric Contracting Service Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403; and other actions by CMP 3 and CMP 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-38 Log #694 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Donald J. Hicks, Florida Electric Contracting Service Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, and other actions by CMP 3 and CMP 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-39 Log #714 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Joseph DeRosa, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with proposal 1-109, log 1403 and other actions by Code-Making Panel 3 and Code-Making Panel 9 to allow the use of handhole enclosures and to establish installation requirements in Articles 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-40 Log #723 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Pascal McFadden, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: The correlates with proposal 1-109, log 1403, and other actions for Code-Making Panel 3 and Code-Making Panel 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-41 Log #875 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Steven Siems, Florida Electric Service Co. Inc. / Rep. Neca South Florida
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109, Log #1403; and other actions by CMP 3 and CMP 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-42 Log #882 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Harold K. Siems, Florida Electric Service Co. Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, and other actions by CMP 3 and CMP 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-43 Log #1291 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Paul Yesbeck, Acolite Claude United Sign Co.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109, Log 1403 and other actions by CMP-3 and CMP-9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-44 Log #1341 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Victor Lombardi, Miami-Dade County Building Department
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, and other actions by CMP-3 and CMP-9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-45 Log #2852 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Jose Gonzalez, Miami Dade Bldg. Department
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosue.
Substantiation: This correlates with 1-109 Log #1403 and other actions by CMP 3 and CMP 9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-46 Log #3080 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Steven Gilbert, Miami Dade Building Department
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log 1403, and other actions by Code Making Panel 3 and Code Making Panel 9 to allow the use of handhole enclosures and to establish installation requirements in Articles 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-47 Log #3086 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Billy Jackson, Miami Dade County Building Department
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log 1403, and other actions by Code Making Panel 3 and Code Making Panel 9 to allow the use of handhole enclosures and to establish installation requirements in Articles 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-48 Log #3458 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Arnold M. Velazquez, Arnold & Associates Inc.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, and other actions by CMP-3 and CMP-9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-49 Log #3631 NEC-P03 **Final Action: Accept in Principle**
(300.15)

Submitter: Stephen Kovach, Dade County Building & Zoning Dept.
Comment on Proposal No: 3-78
Recommendation: Add new level to 300.15 to allow use of a bottomless handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, and other actions by CMP-3 and CMP-9 to allow the use of handhole enclosures and to establish installation requirements in 314 and 800, as well as establishing a definition in Article 100.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 3-51.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-50 Log #1403 NEC-P03 **Final Action: Accept in Principle**
(300.15(1))

Submitter: Joseph McCann, City of Coral Springs
Comment on Proposal No: 3-77
Recommendation: A box of conduit body shall not be required where a splice, tap or pull point is in an approved underground handhole and conductors are listed for wet locations where the wiring method is conduit, tubing or direct burial cables.
Substantiation: Direct buried conductors or cables are already permitted to be spliced or tapped without the use of splice boxes. 300.5(E).
In reference to running conduits to an open bottom handhole, there are a number of articles within the Code already. Disallow this practice.
Note: Supporting Material available for review at NFPA headquarters.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement in Comment 3-51. Section 300.15(L) should only deal with whether a box or a conduit body is required, while 314.30 or Part V of Article 110 provides the necessary requirements for installation.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been accepted.
It would be very difficult, if not impossible, for an electrical inspector to evaluate a product of this type for suitability of installation and use. Listed Directional Boring Raceways are available and should be required to ensure that the raceway and the installed conductors are not damaged during installation.

3-51 Log #2192 NEC-P03 **Final Action: Accept in Principle**
(300.15(L))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 3-77
Recommendation: Accept the panel action in principle. Revise the paragraph to read as follows:
(L) Manholes and Handhole Enclosures. Where accessible only to qualified persons, a box or conduit body shall not be required for conductors in manholes or handhole enclosures, except where connecting to electrical equipment. The installation shall comply with Part V of Article 110 in the case of manholes, and 314.30 in the case of handhole enclosures.
Substantiation: The defined term in Article 100 will be "handhole enclosures" in order to differentiate these items from simple openings such as required in 410.15(B). CMP 9 developed a comprehensive section (314.30) to incorporate the appropriate requirements for these enclosures.
Panel Meeting Action: Accept in Principle
The panel revises the text in the 2005 NEC draft as follows:
"(L) Manholes and Handhole Enclosures. Where accessible only to qualified persons, a box or conduit body shall not be required for conductors in manholes or handhole enclosures, except where connecting to electrical equipment. The installation shall comply with the provisions of Part V of Article 110 for manholes, and 314.30 for handhole enclosures.~~Part IV of Article 314.~~ "
Panel Statement: Handholes have been addressed in 300.15(L). The term "handhole enclosures" will be added to differentiate from handholes in metal poles for light fixtures.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-52 Log #981 NEC-P03 **Final Action: Reject**
(300.16)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 3-79
Recommendation: The proposed change from "open wiring" to "exposed" should have been accepted by the panel.
Substantiation: The reason for removing the term "open wiring" is that 1) is it 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 uninsulated. The attempt here is to use the term "exposed" rather than "open wiring" which is better understood in the field. The change from "open wiring" 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.
Panel Meeting Action: Reject
Panel Statement: The submitter did not provide any new substantiation addressing the issues raised by the panel in the panel statement.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
PACE: Leaving the term "open wiring" in the NEC will continue to lead to confusion in the field. The term "open wiring" leads people to believe that the wiring is not insulated. The term "open wiring" is not defined while the term "exposed" is defined in the NEC. This change would clarify the meaning and remove confusion.

3-53 Log #2377 NEC-P03 **Final Action: Reject**
(300.16)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 3-79
Recommendation: The Proposal should be accepted.
Substantiation: See the Negative Comment by Mr. Pace.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 3-52.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
PACE: See my explanation of negative vote on Comment 3-52.

3-54 Log #2378 NEC-P03 **Final Action: Reject**
(300.16)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 3-80
Recommendation: The Proposal should be accepted.
Substantiation: See the Negative Comment by Mr. Pace on Proposal 3-79.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 3-52.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
PACE: See my explanation of negative vote on Comment 3-52.

3-55 Log #971 NEC-P03 **Final Action: Reject**
(300.16(A))

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 3-80
Recommendation: The proposed change from "open wiring" to "exposed" should have been accepted by the panel.
Substantiation: The reason for removing the term "open wiring" is that 1) is it 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 uninsulated. The attempt here is to use the term "exposed" rather than "open wiring" which is better understood in the field. The change from "open wiring" 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.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 3-52.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
PACE: See my explanation of negative vote on Comment 3-52.

3-56 Log #2195 NEC-P03 **Final Action: Accept**
(300.19(A))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 3-84
Recommendation: Continue to reject the proposal.
Substantiation: The exception does not refer to any Chapter 3 wiring method; it refers to a reinforced conductor/cable design with a layer of steel wires running throughout. If these wired are clamped in a special termination fitting at the upper end, the cable becomes self-supporting over its vertical run. The cable probably should be listed in Table 310.13 eventually. It is commercially known as "borehole" cable, and a customary application is in mines.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-57 Log #150 NEC-P03 **Final Action: Reject**
(300.19(A) Exception)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 3-84
Recommendation: Delete the exception as proposed.
Substantiation: Because "wire armored cable" is totally unfamiliar to most NEC users, there is a risk that installers will presume this exception applies to modern Type AC cable, a use that has not been proposed nor its safety substantiated. It may very well have been installed this way and functioned safely, from the 1920s to the early 1970s, and no one is demanding its immediate removal. Still, it's not made or sold, and the potential for confusion is an additional argument for the exception's deletion.
Panel Meeting Action: Reject
Panel Statement: Apparently this exception refers to a reinforced conductor/cable design with a layer of steel support wires built into the cable and is used for vertical applications where the cable is installed in runs with the steel wires being used for support of the cable.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-58 Log #1366 NEC-P03 **Final Action: Reject**
(300.19(A) Exception)

Submitter: Andre R. Cartal, Princeton Borough Building Dept.
Comment on Proposal No: 3-84
Recommendation: Please reconsider the proposal to delete the exception.
Substantiation: The Panel statement is interesting but 320.100 does not appear to recognize this type of armored cable construction. If the intent was to require that armored cable be constructed with steel armor (rather than aluminum) to comply with this section, then the code should simply say so. There is just no product that meets the description in the present code language.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 3-57.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
CASPARRO: This comment should have been rejected.
See my explanation of negative vote on Comment 3-526.

3-59 Log #2416 NEC-P03 **Final Action: Reject**
(300.19(A) Exception)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 3-84
Recommendation: Accept the proposal in principle. The Exception should be revised to change "Steel wire armor cable" in the first sentence of the exception to "steel armor Type AC cable".
Substantiation: The submitter sought to have the exception removed because "steel wire armored cable" was not recognized by the NEC. The Panel Statement supports the submitter's contention through its explanation that the exception applies to steel Type AC cable.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 3-57. Not all armored cable is Type AC cable. This clarifies the type of cable to which the exception applies.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-60 Log #2904 NEC-P03 **Final Action: Reject**
(300.21)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 3-88
Recommendation: Accept this proposal with the following revision to the submitters proposed text:
300.21 Spread of Fire or Products of Combustion.
Electrical installations in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around electrical penetrations through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.
All metal and nonmetallic outlet boxes installed in the same cavity or with a horizontel spacing of less than 600 mm (24 in.) on opposite sides of fire rated wall assemblies shall use a classified wall opening protective material. Outlet boxes shall not be installed directly behind each other (back to back).

FPN: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire-resistance–rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 300.21 can be found in building codes, fire resistance directories, and product listings.

Substantiation: The proposed text will make it easier for the designers, contractors and inspectors to understand the proper installation of a outlet box when used in a fire classified wall assembly. The current outlet box classifications varies per the manufacturer and can be confusing causing outlet boxes being missed used. This proposal is an issue of safety and the prevention of the spread of fire within a building. Yes it will have an added cost due to additional material and labor. But this is an issue of safety. The panel statement states:

"There are many different fire-rating scenarios based upon the different materials used in the fire rated wall or ceiling assembly and this information is available in the UL Fire Resistance Directories. The fire resistance of an assembly is tested on a case-by-case basis under the design information and the types of materials submitted for the fire test. The information on boxes and the related penetrations into these fire rated assemblies is very detailed and, again, is based upon actual test criteria of the particular box submitted for the fire test."

This is evidence of the confusion in the field. One outlet box can be installed with a different spacing than another or in a different configuration than another. The use of classified wall opening protective material (Fire Stop Putty Pads) does simplify this requirement with a couple of sentences. The UL Directory is very clear on the use of fire stopping materials. In addition, Outlet Boxes still have to be classified for fire rated assemblies.

Metal conduits, nonmetallic conduits, cables, cable tray, water pipes or other wall penetrations are require to use a classified fire stopping material when penetrating a fire wall assembly. Outlet boxes should not be the exception to this rule and the outlet box should not be relied on as the sole source of preventing fire from spreading from one room to another.

Panel Meeting Action: Reject

Panel Statement: Generally, metal and nonmetallic boxes must not be installed on opposite sides of walls and partitions in fire rated assemblies, as stated in the recommended text but there are nonmetallic boxes that have been tested and classified for use in such construction without wall opening protective materials. There are also nonmetallic boxes that can be installed within 3 inches of each other within a cavity in a back-to-back installation while still maintaining the 2-hour fire rating of the wall without wall opening protective materials.

There are many different fire-rating scenarios based upon the different materials used in the fire rated wall or ceiling assembly and this information is available in the UL Fire Resistance Directories. The fire resistance of an assembly is tested on a case-by-case basis under the design information and the types of materials submitted for the fire test. The information on boxes and the related penetrations into these fire rated assemblies is very detailed and, again, is based upon actual test criteria of the particular box submitted for the fire test.

Trying to condense this information into a few sentences to be added to this section would very possibly leave out very critical information about particular box installations. The basic concept is already provided in this section with a Fine Print Note directing the user to the information and is better left in the fire resistance directory with all its intricacies.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

CASPARRO: This comment should have been accepted.

See my explanation of negative vote on Comment 3-61.

3-61 Log #3239 NEC-P03 **Final Action: Reject**
(300.21)

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 3-88

Recommendation: This Panel should have accepted this proposal.

Substantiation: The panel statement reads in part as follows: "The basic concept is already provided in this section with a fine print note directing the user to information and is better left in the fire resistance directory with all its intricacies.

We disagree with the panel statement that the fine print note is adequate in ensuring the requirements of this section. Text in the form of a Fine Print Note is for informational purposes only and is not enforceable. The main text needs to be clear in its intent so that a minimum requirement for the use of classified wall opening protective material is installed where needed. This proposal does not in anyway contradict the information provided in the Fine Print Note but rather establishes enforceable language that will ensure compliance with the installation requirements outlined in the UL Fire Directories.

This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement in Comment 3-60.

It would be too difficult to cover all of the provisions for classifying a box in a fire rated wall or ceiling in 300.21 and is better left in the UL Fire Resistance Directory.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

CASPARRO: This comment should have been accepted.

The panel statement reads in part as follows:

"The basic concept is already provided in this section with a fine print note directing the user to information and is better left in the Fire Resistance Directory with all its intricacies. We disagree with the panel statement that the fine print vote is adequate in ensuring the requirements of this section. Text in the form of a fine print note is for informational purposes only and is not enforceable. The main text needs to be clear in its intent so that a minimum requirement for the use of classified wall opening protective material is installed where needed. This proposal does not in any way contradict the information provided in the fine print note but rather establishes enforceable language that will ensure compliance with the installation requirements outlined in the UL Fire Directories.

3-62 Log #3240 NEC-P03 **Final Action: Reject**
(300.21)

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 3-87

Recommendation: This Panel should have accepted this proposal.

Substantiation: Further consideration should be given to this proposal. This requirement already exists in 300.7 where raceways are exposed to different temperatures. Also Fire Resistance Directories require sleeves to be sealed. The panel statement that to meet the requirements of this proposal would be impossible is not true. Areas to be sealed, as outlined in this proposal, are accessible. The increased level of safety this proposal will provide warrants the additional costs in material and labor necessary to meet this requirement.

This Comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards committee.

Panel Meeting Action: Reject

Panel Statement: There are many different fire-rating scenarios based on the differing materials used in the fire rated wall or ceiling assembly ,and this information is available in the UL Fire Resistance Directories. The fire resistance of an assembly is tested on a case-by-case basis under the design information and the types of materials submitted for the fire test. The information on boxes, raceways, and the related penetrations into these fire-rated assemblies is very detailed and, again, is based on actual test criteria of the particular design assembly with all of the specific components submitted for the fire test. Section 300.21 and its accompanying fine print note provides the information necessary so the installer can apply the approved method as outlined in the UL Fire Resistance Directory.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

CASPARRO: This comment should have been accepted.

Further consideration should be given to this comment. This requirement already exists in 300.7, where raceways are exposed to different temperatures. Also, Fire Resistance Directories require sleeves to be sealed. Areas to be sealed, as outlined in this proposal, are accessible. The increased level of safety this proposal will provide warrants the additional costs in material and labor necessary to meet this requirement.

The submitter has valid concerns that smoke kills thousands of people each year.

3-63 Log #280 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Technical Committee on Air Conditioning

Comment on Proposal No: 3-89

Recommendation: Continue to reject this proposal.

Substantiation: The Technical Committee on Air Conditioning agrees with the panel action and panel statement.

This comment is one in a series of comments including 3-89, 3-90, 3-130, 3-169, 3-197, 3-228, 3-242, 3-251, 3-267, and 3-291.

Panel Meeting Action: Accept

Panel Statement: The panel continues to reject the proposal.

The panel is acting on this and other comments based on the Standards Council decision dated November 13, 2003 that is identified as Number 03-10-25 plus a subsequent letter by the Standards Council Chairman, Philip J. DiNenno, dated December 3, 2003. This decision states, in pertinent part as follows:

"The Council believes, that the best course of action for the NEC project is to generally refrain, unless absolutely necessary, from making revisions that interrelate with the NFPA 90A in advance of completion of the latest revision cycle of NFPA 90A, and instead to maintain the status quo in the NEC project on the applicable technical subjects pending the completion of the NFPA 90A revision

cycle."

This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected comments.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: Panel 3 acted to reject all comments supporting duct cable or referencing to NFPA 90A. Panel 3 acted to accept all comments opposing duct cable or opposing a reference to NFPA 90A. Panel 3 did not analyze comments on a technical basis, as required by the NFPA Regulations Governing Committee Projects. The professionally responsible course of action would have been for Panel 3 to act on the comments, and leave acceptance or rejection to the NEC TCC or Standards Council. Rather than act on each comment based on its merit, Panel 3 acted on duct cable by relying on the NFPA Standards Council decision in a letter by Standards Council Chairman, Philip J DiNenno to Mr. Loren Caudill, dated December 3, 2003. This letter states:

"Standards Council Decision Number 03- 10-25 states, in pertinent part, as follows:

The Council believes, that the best course of action for the NEC project is to generally retrain, unless absolutely necessary, from making revisions that interrelate with NFPA 90A in advance of completion of the latest revision cycle of NFPA 90a, and instead to maintain the status quo in the NEC project on the applicable technical subjects pending the completion of the NFPA 90A revision cycle.

The above-quoted language explicitly states that the NEC project should, in this revision cycle refrain, unless absolutely necessary, from making any revisions to the NEC that interrelate with NFPA 90A, and should instead "maintain the status quo" - that is, the language currently existing in the 2002 edition of the NEC - on all such subjects pending the completion of the NFPA 90A revision cycle."

The Standards Council's directive seems in opposition to Regulations Governing Committee Projects: " 1-2.1 General. The Standards Council may adopt guidelines to supplement but not conflict with these regulations." The regulations require panels to act on submitted proposals and comments, based on technical content.

A couple of decades ago, the Standards Council ruled that the Technical Committee on Air Conditioning has jurisdiction over materials in the air distribution system. This jurisdiction was reiterated by the NEC TCC in their comment preceding Proposal 3-89 in the ROP.

The Technical Committee on Air Conditioning sent proposals to revise the NEC to prohibit installation of combustible wiring materials in the air distribution system, other than in ceiling cavity plenums and raised floor plenums (called other space used for environmental air in the NEC). With their comments, based on NFPA 90A-2002, the air conditioning committee supported their proposals; and, in addition, supported installation of duct cable (identified as listed limited combustible cable in NFPA 90A-2002) in air ducts and plenums, where associated with the air distribution system.

Presently, the NEC (725.61, 760.61, 770.53, 800.53, & 820.53) permits unrestricted quantities of combustible plenum cable in all parts of the air distribution system. The letter from the Standards Council "flies in the face" of life safety by directing Panel 3 to "maintain the status quo" for wire and cable. This decision by the NFPA Standards Council condones permitting unrestricted quantities of combustible material in air ducts in spite of the air conditioning committee's proposal and comments to prohibit such practice.

The following is for those reading the ROC. Hundreds of comments were accepted based on the Standards Council letter... without an affirmative comment. A large number of "Accepted" comments would have been rejected, based on the substantiation. For example, there are about 40 comments where the substantiation references "1-69" without further explanation. There are about 40 comments where the substantiation is based solely on toxicity, which is clearly not under jurisdiction of Panel 3. Many comments, in the substantiation, arguably contradict the Standards Council's ruling that the Technical Committee on Air Conditioning has jurisdiction over materials placed in the air distribution system. Reader Beware!

3-64 Log #281 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Technical Committee on Air Conditioning
Comment on Proposal No: 3-90
Recommendation: Continue to reject this proposal.
Substantiation: The Technical Committee on Air Conditioning agrees with the panel action and panel statement.

This comment is one in a series of comments including 3-89, 3-90, 3-130, 3-169, 3-197, 3-228, 3-242, 3-251, 3-267, and 3-291.

Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-65 Log #1615 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-89
Recommendation: Continue to reject.
Substantiation: I agree with both the panel action and panel statement to reject Proposal 3-89. No technical substantiation has been provided that a change to the 2002 NEC language is needed or required. This comment represents the official position of the International Brotherhood of Electrical Workers Code and Standards Committee.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-66 Log #1616 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-90
Recommendation: Continue to reject.
Substantiation: I agree with both the panel action and panel statement to reject Proposal 3-90. No technical substantiation has been provided that a change to the 2002 NEC language is needed or required. This comment represents the official position of the International Brotherhood of Electrical Workers Code and Standards Committee.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-67 Log #1780 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Richard P. Owen, City of St. Paul, Minnesota
Comment on Proposal No: 3-89
Recommendation: Continue to reject.
Substantiation: The Panel 3/Panel 16 Task Group, appointed by the NEC TCC, developed this comment.

The task group agrees with Panel 3's action and statement.

The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.

Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-68 Log #1781 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Richard P. Owen, City of St. Paul, Minnesota
Comment on Proposal No: 3-90
Recommendation: Continue to reject.
Substantiation: The Panel 3/Panel 16 Task Group, appointed by the NEC TCC, developed this comment.

The task group agrees with Panel 3's action and statement.

The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and

Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-69 Log #1794 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Richard P. Owen, City of St. Paul, Minnesota
Comment on Proposal No: 3-89
Recommendation: Continue to reject.
Substantiation: The Panel 3/Panel 16 Task Group, appointed by the NEC TCC, developed this comment.
The task group agrees with Panel 3's action and statement.
The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-70 Log #1795 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Richard P. Owen, City of St. Paul, Minnesota
Comment on Proposal No: 3-90
Recommendation: Continue to reject.
Substantiation: The Panel 3/Panel 16 Task Group, appointed by the NEC TCC, developed this comment.
The task group agrees with Panel 3's action and statement.
The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-71 Log #2897 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Richard Fransen, Daikin America, Inc. / Rep. Cable Fire Research Association
Comment on Proposal No: 3-89
Recommendation: Continue to reject this proposal.
Substantiation: CFRA agrees with the panel action.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-72 Log #2898 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Richard Fransen, Daikin America, Inc. / Rep. Cable Fire Research Association
Comment on Proposal No: 3-90
Recommendation: Continue to reject this proposal.
Substantiation: CFRA agrees with the panel action.
Panel Meeting Action: Accept
Panel Statement: See the panel statement on Comment 3-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-73 Log #3006 NEC-P03 **Final Action: Accept in Part**
(300.22)

Submitter: Ray R. Keden, Erico, Inc.
Comment on Proposal No: 3-94
Recommendation: Continue to reject attempts to add definitions to subdivided plenum.
Substantiation: No adequate substantiation has been provided why the use of plenum rated cable should be limited in applications. We have not been able to find one contractor in the past ten months who had installed any inside an air duct. When we presented this installation method to engineers/cable network designers, we only received as response head shaking and the question Why would anyone do that?
Panel Meeting Action: Accept in Part
Panel Statement: See the panel action and statement on Comment 3-74.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Comment on Affirmative:
AYER: This should have been a straight "Accept". The panel has agreed entirely with the submitter and rejected any attempt to subdivide plenums.
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-74 Log #3841 NEC-P03 **Final Action: Accept in Part**
(300.22)

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association
Comment on Proposal No: 3-89
Recommendation: Revise to read as follows:
300.22 Wiring in Ducts, Plenums, and Other Air-Handling Spaces. The provisions of this section apply to the installation and uses of electric wiring and equipment in ducts, plenums, and other air-handling spaces.
FPN: See Article 424, Part VI, for duct heaters.
(A) Ducts for Dust, Loose Stock, or Vapor Removal. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors. No wiring system of any type shall be installed in any duct, or shaft containing only such ducts, used for vapor removal or for ventilation of commercial-type cooking equipment.
(B) Ducts or Other Spaces Used for Environmental Air. Only wiring methods consisting of Type MI cable, Type MC cable employing a smooth or corrugated impervious metal sheath without an overall nonmetallic covering, electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit without an overall nonmetallic covering shall be installed in ducts or plenums specifically fabricated to transport environmental air. Flexible metal conduit ~~and liquidtight flexible metal conduit~~ shall be permitted, in lengths not to exceed 1.2 m (4 ft), to connect physically adjustable equipment and devices permitted to be in these ducts and plenum chambers. The connectors used with flexible metal conduit shall effectively close any openings in the connection. Equipment and devices shall be permitted within such ducts or plenum chambers only if necessary for their direct action upon, or sensing of, the contained air. Where equipment or devices are installed and illumination is necessary to facilitate maintenance and repair, enclosed gasketed-type luminaires (fixtures) shall be permitted.
(C) Other Space Used for Environmental Air . This section applies to space used for environmental air-handling purposes other than ducts and plenums as specified in 300.22 (A) and (B). It does not include habitable rooms or areas of buildings, the prime purpose of which is not air handling. Wiring methods installed in spaces covered by Section 300.22 (C) shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the space into a space covered by section 300.22 (B).
FPN: The space over a hung ceiling used for environmental air-handling purposes is an example of the type of other space to which this section applies.
Exception: This section shall not apply to the joist or stud spaces of dwelling

units where the wiring passes through such spaces perpendicular to the long dimension of such spaces.

(1) Wiring Methods. The wiring methods for such other space shall be limited to totally enclosed, nonventilated, insulated busway having no provisions for plug-in connections, Type MI cable, Type MC cable without an overall nonmetallic covering, Type AC cable, or other factory-assembled multiconductor control or power cable that is specifically listed for the use, or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath. Other types of cables and conductors shall be installed in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, flexible metal conduit, or, where accessible, surface metal raceway or metal wireway with metal covers or solid bottom metal cable tray with solid metal covers.

(2) Equipment. Electrical equipment with a metal enclosure, or with a nonmetallic enclosure listed for the use and having adequate fire-resistant and low-smoke-producing characteristics, and associated wiring material suitable for the ambient temperature shall be permitted to be installed in such other space unless prohibited elsewhere in this Code.

Exception: Integral fan systems shall be permitted where specifically identified for such use.

(D) Information Technology Equipment. Electric wiring in air-handling areas beneath raised floors for information technology equipment shall be permitted in accordance with Article 645. Wiring methods installed in spaces covered by Section 300.22 (D) shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the space into a space covered by section 300.22 (B).

Substantiation: This comment accepts three recommendations by CMP 3: (1) not to go into detail on the types of plenums, (2) eliminating liquidtight flexible metal conduit from the wiring methods permitted in plenums and (3) improving on the original proposal, which had as its primary intent to make it clear that wiring systems should be permitted to extend up to 6 inches into a more restrictive environment, without developing any limitations for their use in less restrictive environments.

Explanation:

* It is important that installers of wiring in plenums and other spaces used for environmental air be able to complete installations without having to change wiring methods in order to terminate their installation just outside the plenum area, because that will help them and prevent unwarranted increases in wiring installation costs. There are multiple examples in the NEC where materials are permitted to extend slightly beyond the original space, including the following: 110.26 (3), 210.52 (5) Exception, 300.50 (A) Exceptions 2 and 3, 426.22 (b), 520.42, 550.13 (G) (3), and Table 830.12. Moreover, the concept of using 6 inches as a small distance is used over 30 times in the NEC.

* This comment recommends continued rejection of a subdivision of "other spaces used for environmental air" and continued rejection of granting priority to NFPA 90A on choices of wiring methods.

* The input from CMP 3 and from the NEC Technical Coordinating Committee makes it clear that the terminology used in 300.22 has served the NEC well and needs no change. It has also become clear now that the expertise needed for choosing the type of wiring systems permitted in any space should be the prerogative of the NEC, which (through its various panels and its Technical Correlating Committee) has greater expertise and a broader view than the Technical Committee on Air Conditioning (responsible for NFPA 90A). Therefore, as a member of the Technical Committee on Air Conditioning, I believe the NEC panels should continue making their own choices regarding wiring methods.

* It has already been shown in detail by the fire hazard and fire risk analysis presented together with my original proposals (see for example the section on pages 2080-2091 of the NEC-ROP of the substantiation for my proposal 3-130) that there is no need to change the requirements, or limit the application, for wiring methods in plenums, because the fire safety record is excellent.

* I understand that this comment represents a change in some of the concepts the submitter believed when the proposal was submitted, but "even old dogs can learn".

This comment differs from a companion comment that also addresses the concept, introduced by CMP 16, of "inaccessible areas" of plenum spaces (or of "other spaces used for environmental air") with the intention of prohibiting some 300.22 (C) wiring methods from being used in those areas. This comment assumes that the concept of "inaccessible areas" will be rejected.

This comment is one of a series of comments on Articles 300, 725, 760, 770, 800, 820 and 830, regarding "plenum cables". The philosophy behind all the comments is that the NEC is OK as published in 2002, but that 2 minor changes might represent improvements: (i) the clarification of the 6 inch extension of a wiring method into a more restricted environment and (ii) the clarification in the Fine Print Notes that a cable listed to NFPA 262 is listed both based on its "low-smoke" characteristics and its "low-flame-spread" characteristics, and that the two are not listed separately.

Also see comments from the chairman of the Technical Correlating Committee.

Panel Meeting Action: Accept in Part

Accept the part to delete "and liquidtight flexible metal conduit" and reject remainder of comment.

Panel Statement: The Panel accepted the deletion of liquidtight flexible metal conduit in 300.22(B). The remainder of the comment is rejected since there are construction methods that would permit the transition of cabling systems into raceway systems in more restrictive areas. For example, EMT or flexible metal conduit can be stubbed into the "other space for environmental air" from the more restrictive space with the transition between raceway and cable based on Section 300.16(A) or (B).

The panel is acting on this and other comments based on the Standards Council decision dated November 13, 2003 that is identified as Number 03-10-25 plus a subsequent letter by the Standards Council Chairman, Philip J. DiNenno, dated December 3, 2003. This decision states, in pertinent part as follows:

"The Council believes, that the best course of action for the NEC project is to generally refrain, unless absolutely necessary, from making revisions that interrelate with the NFPA 90A in advance of completion of the latest revision cycle of NFPA 90A, and instead to maintain the status quo in the NEC project on the applicable technical subjects pending the completion of the NFPA 90A revision cycle."

This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected comments.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-75 Log #3842 NEC-P03 **Final Action: Accept in Part**
(300.22)

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association

Comment on Proposal No: 3-89

Recommendation: Revise to read as follows:

300.22 Wiring in Ducts, Plenums, and Other Air-Handling Spaces. The provisions of this section apply to the installation and uses of electric wiring and equipment in ducts, plenums, and other air-handling spaces.

FPN: See Article 424, Part VI, for duct heaters.

(A) Ducts for Dust, Loose Stock, or Vapor Removal. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors. No wiring system of any type shall be installed in any duct, or shaft containing only such ducts, used for vapor removal or for ventilation of commercial-type cooking equipment.

(B) Ducts or Other Spaces Used for Environmental Air. Only wiring methods consisting of Type MI cable, Type MC cable employing a smooth or corrugated impervious metal sheath without an overall nonmetallic covering, electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit without an overall nonmetallic covering shall be installed in ducts or plenums specifically fabricated to transport environmental air. Flexible metal conduit ~~and liquidtight flexible metal conduit~~ shall be permitted, in lengths not to exceed 1.2 m (4 ft), to connect physically adjustable equipment and devices permitted to be in these ducts and plenum chambers. The connectors used with flexible metal conduit shall effectively close any openings in the connection. Equipment and devices shall be permitted within such ducts or plenum chambers only if necessary for their direct action upon, or sensing of, the contained air. Where equipment or devices are installed and illumination is necessary to facilitate maintenance and repair, enclosed gasketed-type luminaires (fixtures) shall be permitted.

(C) Other Space Used for Environmental Air . This section applies to space used for environmental air-handling purposes other than ducts and plenums as specified in 300.22 (A) and (B). It does not include habitable rooms or areas of buildings, the prime purpose of which is not air handling. Wiring methods installed in spaces covered by Section 300.22 (C) shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the space into a space covered by section 300.22 (B). Wiring methods installed in spaces covered by Section 300.22 (C) shall also be permitted to extend not more than 150 mm (6 in.) into inaccessible spaces covered by section 300.22 (C).

FPN: The space over a hung ceiling used for environmental air-handling purposes is an example of the type of other space to which this section applies.

Exception: This section shall not apply to the joist or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces.

(1) Wiring Methods. The wiring methods for such other space shall be limited to totally enclosed, nonventilated, insulated busway having no provisions for plug-in connections, Type MI cable, Type MC cable without an overall nonmetallic covering, Type AC cable, or other factory-assembled multiconductor control or power cable that is specifically listed for the use, or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath. Other types of cables and conductors shall be installed in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, flexible metal conduit, or, where accessible, surface metal raceway or metal wireway with metal covers or solid bottom metal cable tray with solid metal covers.

(2) Equipment. Electrical equipment with a metal enclosure, or with a nonmetallic enclosure listed for the use and having adequate fire-resistant and low-smoke-producing characteristics, and associated wiring material suitable for the ambient temperature shall be permitted to be installed in such other space unless prohibited elsewhere in this Code.

Exception: Integral fan systems shall be permitted where specifically identified for such use.

(D) Information Technology Equipment. Electric wiring in air-handling areas beneath raised floors for information technology equipment shall be permitted in accordance with Article 645. Wiring methods installed in spaces covered by Section 300.22 (D) shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the space into a space covered by section 300.22 (B). Wiring methods installed in spaces covered by Section 300.22 (D) shall be permitted to extend not more than 150 mm (6 in.) beyond the limits of the space into inaccessible spaces covered by section 300.22 (D).

Substantiation: This comment accepts three recommendations by CMP 3: (1) not to go into detail on the types of plenums, (2) eliminating liquidtight flexible metal conduit from the wiring methods permitted in plenums and (3) improving on the original proposal, which had as its primary intent to make it clear that wiring systems should be permitted to extend up to 6 inches into a more restrictive environment, without developing any limitations for their use in less restrictive environments.

Explanation:

* It is important that installers of wiring in plenums and other spaces used for environmental air be able to complete installations without having to change wiring methods in order to terminate their installation just outside the plenum area, because that will help them and prevent unwarranted increases in wiring installation costs. There are multiple examples in the NEC where materials are permitted to extend slightly beyond the original space, including the following: 110.26 (3), 210.52 (5) Exception, 300.50 (A) Exceptions 2 and 3, 426.22 (b), 520.42, 550.13 (G) (3), and Table 830.12. Moreover, the concept of using 6 inches as a small distance is used over 30 times in the NEC.

* This comment recommends continued rejection of a subdivision of "other spaces used for environmental air" and continued rejection of granting priority to NFPA 90A on choices of wiring methods.

* The input from CMP 3 and from the NEC Technical Coordinating Committee makes it clear that the terminology used in 300.22 has served the NEC well and needs no change. It has also become clear now that the expertise needed for choosing the type of wiring systems permitted in any space should be the prerogative of the NEC, which (through its various panels and its Technical Correlating Committee) has greater expertise and a broader view than the Technical Committee on Air Conditioning (responsible for NFPA 90A). Therefore, as a member of the Technical Committee on Air Conditioning, I believe the NEC panels should continue making their own choices regarding wiring methods.

* It has already been shown in detail by the fire hazard and fire risk analysis presented together with my original proposals (see for example the section on pages 2080-2091 of the NEC-ROP of the substantiation for my proposal 3-130) that there is no need to change the requirements, or limit the application, for wiring methods in plenums, because the fire safety record is excellent.

* I understand that this comment represents a change in some of the concepts the submitter believed when the proposal was submitted, but "even old dogs can learn".

This comment recognizes that CMP 16 has introduced a new concept: "inaccessible areas" of plenum spaces (or of "other spaces used for environmental air") with the intention of prohibiting some 300.22 (C) wiring methods from being used in those areas. That concept has not been approved by CMP 3 and I support that rejection. However if continued to be accepted by CMP 16 and then approved by the membership and by Standards Council, the revised articles 770, 800, 820 and 830 in NEC-2005 would contain the concept of "inaccessible areas" and create confusion by forcing some users to keep changing wiring methods as they work their way through plenums. Acceptance of this comment would solve that problem. Of course, even if the concept of "inaccessible"areas of plenum spaces is ultimately rejected (as I feel it should), that part of this comment could then still be a useful clarification or could be eliminated after the fact by the membership, the NEC Technical Correlating Committee or Standards Council.

This comment is one of a series of comments on Articles 300, 725, 760, 770, 800, 820 and 830, regarding "plenum cables". The philosophy behind all the comments is that the NEC is OK as published in 2002, but that 2 minor changes might represent improvements: (i) the clarification of the 6 inch extension of a wiring method into a more restricted environment and (ii) the clarification in the Fine Print Notes that a cable listed to NFPA 262 is listed both based on its "low-smoke" characteristics and its "low-flame-spread" characteristics, and that the two are not listed separately.

Also see comments from the chairman of the Technical Correlating Committee.

Panel Meeting Action: Accept in Part

Panel Statement: See the panel action and statement on Comment 3-74.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-76 Log #3844 NEC-P03 **Final Action: Reject**
(300.22)

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association

Comment on Proposal No: 3-89

Recommendation: 300.22 *(no change except as follows)*

(1) Wiring Methods. The wiring methods for such other space shall be limited to totally enclosed, nonventilated, insulated busway having no provisions for plug-in connections, Type MI cable, Type MC cable without an overall nonmetallic covering, Type AC cable, or other factory-assembled multiconductor communications, control or power cable that is specifically listed for the use, or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath. Other types of cables and conductors shall be installed in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, flexible metal conduit, or, where accessible, surface metal raceway or metal wireway with metal covers or solid bottom metal cable tray with solid metal covers.

Substantiation: This comment simply adds "communications cables" to "control and power cables" as cables that can be listed specifically for use in plenum spaces. This was always understood but is being made explicit. This is clear by the fact that articles 770 (Optical Fiber Cables and Raceways), 800 (Communications Circuits), 820 (Community Antenna Television and Radio Distribution Systems) and 830 (Network-Powered Broadband Communications Systems) all reference section 300.22. This does not imply changing the jurisdiction of Chapters 3 and 8, but simply accepting that many of the cables that are actually listed for use in plenum spaces are data or communications cables.

Panel Meeting Action: Reject

Panel Statement: The material is already covered in Chapter 8 and is not needed here.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-77 Log #3845 NEC-P03 **Final Action: Accept**
(300.22)

Submitter: Marcelo M. Hirschler, GBH International / Rep. Fire Retardant Chemicals Association

Comment on Proposal No: 3-94

Recommendation: *Continue accepting only the part of this proposal that deals with eliminating "liquidtight flexible metal conduit" as an acceptable wiring method in spaces covered by 300.22 (B) (Ducts or plenums used for environmental air) and rejecting all other portions of this proposal.*

Substantiation: This comment accepts three recommendations by CMP 3: (1) not to go into detail on the types of plenums, (2) eliminating liquidtight flexible metal conduit from the wiring methods permitted in plenums, and (3) not adding unnecessary references to NFPA 90A.

Explanation:

* This comment recommends continued rejection of a subdivision of "other spaces used for environmental air" and continued rejection of granting priority to NFPA 90A on choices of wiring methods.

* The input from CMP 3 and from the NEC Technical Coordinating Committee makes it clear that the terminology used in 300.22 has served the NEC well and needs no change. It has also become clear now that the expertise needed for choosing the type of wiring systems permitted in any space should be the prerogative of the NEC, which (through its various panels and its Technical Correlating Committee) has greater expertise and a broader view than the Technical Committee on Air Conditioning (responsible for NFPA 90A). Therefore, as a member of the Technical Committee on Air Conditioning, I believe the NEC panels should continue making their own choices regarding wiring methods.

* It has already been shown in detail by the fire hazard and fire risk analysis presented together with my original proposals (see for example the section on pages 2080-2091 of the NEC-ROP of the substantiation for my proposal 3-130) that there is no need to change the requirements, or limit the application, for wiring methods in plenums, because the fire safety record is excellent.

* I understand that this comment represents a change in some of the concepts the submitter believed when the proposal was submitted, but "even old dogs can learn".

This comment is one of a series of comments on Articles 300, 725, 760, 770, 800, 820 and 830, regarding "plenum cables". The philosophy behind all the comments is that the NEC is OK as published in 2002, but that 2 minor changes might represent improvements: (i) the clarification of the 6 inch extension of a wiring method into a more restricted environment and (ii) the clarification in the Fine Print Notes that a cable listed to NFPA 262 is listed both based on its "low-smoke" characteristics and its "low-flame-spread" characteristics, and that the two are not listed separately.

Also see comments from the chairman of the Technical Correlating Committee.

Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-78 Log #282 NEC-P03 **Final Action: Accept**
(300.22(B))

Submitter: Technical Committee on Air Conditioning
Comment on Proposal No: 3-92
Recommendation: Continue to reject this proposal.
Substantiation: The Technical Committee on Air Conditioning supports the panel action on this proposal because of the panel action of proposal 3-94 which deleted liquidtight flexible metal conduit.
Panel Meeting Action: Accept
Panel Statement:
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-79 Log #1617 NEC-P03 **Final Action: Accept**
(300.22(B))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 3-92
Recommendation: Continue to reject.
Substantiation: The submitter has submitted two terms (Ceiling Cavity and Raised Floor Plenums) that are not recognized in the NFPA 70 Standard. This comment 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: 13
Ballot Results: Affirmative: 13

3-80 Log #1782 NEC-P03 **Final Action: Accept**
(300.22(B))

Submitter: Richard P. Owen, City of St. Paul, Minnesota
Comment on Proposal No: 3-92
Recommendation: Continue to reject.
Substantiation: The Panel 3/Panel 16 Task Group, appointed by the NEC TCC, developed this comment.
The task group agrees with Panel 3's action and statement.
The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.
Panel Meeting Action: Accept
Panel Statement:
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-81 Log #1796 NEC-P03 **Final Action: Accept**
(300.22(B))

Submitter: Richard P. Owen, City of St. Paul, Minnesota
Comment on Proposal No: 3-92
Recommendation: Continue to reject.
Substantiation: The Panel 3/Panel 16 Task Group, appointed by the NEC TCC, developed this comment.
The task group agrees with Panel 3's action and statement.
The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-82 Log #2899 NEC-P03 **Final Action: Accept**
(300.22(B))

Submitter: Richard Fransen, Daikin America, Inc. / Rep. Cable Fire Research Association
Comment on Proposal No: 3-92
Recommendation: Continue to reject this proposal.
Substantiation: CFRA supports the panel action on this proposal because of the panel action of proposal 3-94 which deleted liquidtight flexible metal conduit.
Panel Meeting Action: Accept
Panel Statement:
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-83 Log #1829 NEC-P03 **Final Action: Accept in Part**
(300-22(B), (C), & (D))

Submitter: Thomas P. Hammerberg, Automatic Fire Alarm Association
Comment on Proposal No: 3-94
Recommendation: Accept this proposal.
Substantiation: The Automatic Fire Alarm Association understands the Air Conditioning Committee has jurisdiction over materials installed in or on air ducts and plenums. Accepting the proposed text provides correlation between the NEC and NFPA 90A-2002.
Panel Meeting Action: Accept in Part
The panel accepts the part to to delete "and liquidtight flexible metal conduit" and rejects remainder of comment.
Panel Statement: The Panel accepts deletion of "and liquidtight flexible metal conduit" but rejects the remainder of the proposal based on the Standards Council ruling.
The panel is acting on this and other comments based on the Standards Council decision dated November 13, 2003 that is identified as Number 03-10-25 plus a subsequent letter by the Standards Council Chairman, Philip J. DiNenno, dated December 3, 2003. This decision states, in pertinent part as follows:
"The Council believes, that the best course of action for the NEC project is to generally refrain, unless absolutely necessary, from making revisions that interrelate with the NFPA 90A in advance of completion of the latest revision cycle of NFPA 90A, and instead to maintain the status quo in the NEC project on the applicable technical subjects pending the completion of the NFPA 90A revision cycle."
This action does not constitute agreement or disagreement with any of the substantiations submitted for the affected comments.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-84 Log #279 NEC-P03 **Final Action: Accept in Part**
(300.22(B), (C), and (D))

Submitter: Technical Committee on Air Conditioning
Comment on Proposal No: 3-94
Recommendation: Accept this proposal in principle. Revise 300.22(B) and (C) as follows:
(B) Ducts or Plenums Used for Environmental Air. The requirements of this section shall apply to air ducts, duct distribution plenums, apparatus casing plenums and air-handling unit room plenums. Only wiring methods consisting of Type MI cable, Type MC cable employing a smooth or corrugated impervious metal sheath without an overall nonmetallic covering, electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit without an overall nonmetallic covering shall be installed in ducts or plenums specifically fabricated to transport environmental air. Flexible metal conduit shall be permitted, in lengths not to exceed 1.2 m (4 ft), to connect physically adjustable equipment and devices permitted to be in these ducts and plenum chambers. The connectors used with flexible metal conduit shall effectively close any openings in the connection. Equipment and devices shall be permitted within such ducts or plenum chambers only if necessary for their direct action upon, or sensing of, the contained air. Where equipment or devices are installed and illumination is necessary to facilitate maintenance and repair, enclosed gasketed-type luminaries (fixtures) shall be permitted.
(C) Other Space Used for Environmental Air. This section applies to space used for environmental air-handling purposes other than ducts and plenums as specified in 300.22(A) and (B). It does not include habitable rooms or areas of buildings, the prime purpose of which is not air handling.
FPN: The spaces over a hung ceiling and under raised floor used for environmental air-handling purposes are examples of the types of other space to which this section applies.

Exception: This section shall not apply to the joist or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces.

Remainder of 300.22(C) is unchanged.

Substantiation: This proposal was submitted by the Technical Committee on Air Conditioning to harmonize its requirements with NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems and to utilize the same terminology for plenums as we have proposed for Articles 725, 760, 770, 800, 820, and 830. The Technical Committee on Air Conditioning recognizes that the NEC's use of the term "other space used for environmental air" in 300.22(C) may include spaces not under the scope of NFPA 90A-2002. Adding the term raised floor to the fine print note in 300.22(C) correlates with the recognition of raised floor plenums that have been in NFPA 90A since 1989.

The original proposal would have revised the title of 300.22(B) from "Ducts or Plenums Used for Environmental Air" to "Ducts or Plenums (Other Than Ceiling Cavity and Raised Floor Plenums) Used for Environmental Air". We now propose a simpler change, namely leaving the title of the section intact and simply inserting a first sentence in the section that states which ducts and plenums 300.22(B) covers.

Panel Meeting Action: Accept in Part

Panel Statement: See the panel action and statement on Comment 3-83.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-85 Log #1423 NEC-P03 **Final Action: Accept in Part**
(300.22(B), (C), and (D))

Submitter: Technical Correlating Committee on Signaling Systems for the Protection of Life and Property

Comment on Proposal No: 3-94

Recommendation: Accept this proposal.

Substantiation: This proposal was submitted by the Technical Committee on Air Conditioning to harmonize the requirements with NFPA 90A-2002, *Standard for the Installation of Air-Conditioning and Ventilating Systems* and the NEC.

The Standards Council has instructed all technical committees to process changes to bring about the complete harmonization of the NFPA family of Codes and Standards and standards. This proposal must be accepted as submitted or accepted in principle with modifications that accomplish the goal of harmonization.

Harmonization can be accomplished by adopting language that clarifies the requirements of section 300.22(B) apply to air ducts, duct distribution plenums, apparatus casing plenums and air-handling unit room plenums, and that the requirements of section 300.22(C) apply to ceiling cavity plenums and raised floor plenums.

Panel Meeting Action: Accept in Part

Panel Statement: See the panel action and statement on Comment 3-83.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-86 Log #1619 NEC-P03 **Final Action: Accept**
(300-22(B), (C), & (D))

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 3-94

Recommendation: Continue to accept in part.

Substantiation: We agree with the panel action and the panel statement. This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Accept

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-87 Log #1778 NEC-P03 **Final Action: Accept in Part**
(300.22(B), (C),& (D))

Submitter: Richard P. Owen, City of St. Paul, Minnesota

Comment on Proposal No: 3-94

Recommendation: Continue to Accept Proposal in Part.

Accept all proposed changes in Proposal 3-94 but delete the following: In (C)(1) Wiring Methods, revise the FPN in the proposal by deleting "on materials permitted in ceiling cavity plenums and raised floor plenum" in the last part of the FPN to read as follows: "FPN: See NFPA 90A-2002, Standard for the Installation of Air-Conditioning and Ventilating Systems, for information ."

Substantiation: The NEC TCC Task Group on Correlation Issues Between Panels 3 and 16 met three times via teleconference calls. The assignment by the TCC Chairman was to attempt to develop a resolution and accompanying comments for the different actions taken on proposals dealing with similar issues by CMP 3 and CMP 16 for their respective Articles in Chapters 7 and 8 of the NEC.

The Task Group studied the issues and determined that there were five major differences in the actions on proposals concerning Articles 725, 760, 770, 800, 820, and 830. The voting on these issues was not unanimous but did pass as at least a simple majority of the Task Group.

One of the major differences involved terms that would be used in Section 300.22 dealing with ducts, plenums, and other spaces used for environmental air.

The phrase "Other Space for Environmental Air" is used in Section 300.22 and various locations within the Articles covered by CMP-3 and 16. Proposals were submitted to both CMP-3 and CMP-16 to provide a subdivision of the "other space for environmental air" to include "raised floor plenums" and "ceiling cavity plenums."

In the Proposal stage, Panel 3 did not accept proposals for the subdivision of the phrase "Other Space for Environmental" with the "raised floor plenums" and "ceiling cavity plenum." Panel 16 did accept the subdivisions of this phrase throughout their articles.

The Task Group members who were at the teleconferences recommended accepting Proposal 3-94 in part by accepting all of the text in the recommendation but deleting "on materials permitted in ceiling cavity plenums and raised floor plenums" in the last part of the FPN under (1) with the FPN to read as follows:

"FPN: See NFPA 90A-2002, The Standard for the Installation of Air-Conditioning and Ventilating Systems, for information.

This phrase was deleted since the Fine Print Note is simply providing a reference back to the information in NFPA 90A and Section 300.22(C) provides the wiring methods and equipment that can be installed in this other space for environmental air.

By accepting the majority of the suggested changes in this proposal, "Other Spaces for Environmental Air" has been further subdivided into two separate spaces, ceiling cavity and raised floor plenums but the Panel still has maintained the electrical industry terminology associated with these spaces. Providing this further subdivision will enhance the usability of the NEC by making it easier to determine what other spaces are being referenced in this section. It will also improve correlation between the NEC and NFPA 90A.

The following members of Panels 3 and 16 participated in this Task Group assignment: From Panel 3, Mr. Sanford E. Egesdal representing the Automatic Fire Alarm Association, Inc., Mr. Ronald E. Maassen representing the National Electrical Contractors Association, and Mr. Mark C. Ode representing Underwriters Laboratories Inc. From Panel 16, Mr. Robert W. Jensen representing the Building Industry Consulting Services International, Mr. Harold C. Ohde representing the International Brotherhood of Electrical Workers, and Mr. Joseph W. Rao representing the Independent Electrical Contractors, Inc. Mr. Richard P. Owen, the Chairman of CMP 3, representing the International Association of Electrical Inspectors, was the chairman of the Task Group.

Panel Meeting Action: Accept in Part

Accept the part to delete "and liquidtight flexible metal conduit" and rejects remainder of comment.

Panel Statement: The Panel accepts deletion of "and liquidtight flexible metal conduit" but rejects the remainder of the proposal based on the Standards Council ruling.

See the panel statement on Comment 3-83.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Abstain: 1

Explanation of Abstention:

EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-88 Log #2900 NEC-P03 **Final Action: Accept in Part**
(300-22(B), (C), & (D))

Submitter: Richard Fransen, Daikin America, Inc. / Rep. Cable Fire Research Association

Comment on Proposal No: 3-94

Recommendation: Accept this proposal.

Substantiation: The NFPA 70 and NFPA 90A need to be harmonized and use the same terminology in order to have a consistent set of NFPA codes and standards.

See the advertisement I have provided for NFPA 5000. It states that NFPA 5000 in "an integral part of the Comprehensive Consensus CodesTM (C3TM) set, the only set of integrated consensus-based codes and standards…" . Unfortunately this claim is a goal and not a reality yet. Panel 3 can advance the goal of harmonizing NFPA codes and standards by accepting this proposal.

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

Panel Meeting Action: Accept in Part

Accept the part to delete "and liquidtight flexible metal conduit" and rejects remainder of comment.

Panel Statement: See the panel statement on Comments 3-83 and 3-87.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Abstain: 1
Explanation of Abstention:
EGESDAL: See my Explanation of Abstention for Comment 3-63.

3-89 Log #512 NEC-P03 **Final Action: Reject**
(300.22(D))

Submitter: Richard E. Loyd Sun Lakes, AZ
Comment on Proposal No: 3-95
Recommendation: Revise text as follows:
(D) Raised Floor Plenums.
(1) Electrical wiring in air-handling areas beneath raised floors in ITE (Information Technology Equipment) Rooms shall comply with all of the requirements of Article 645.
(FPN) Special requirements are found in 645.2 and NFPA 75-1999.
(2) Electrical wiring in air-handling areas beneath raised floors in other than ITE ("Information Technology Equipment) Rooms" shall comply with the provisions of 300.22 (C).
Substantiation: Proposal 3-95 cited a serious safety problem. Standard power and data cables without passing the appropriate flame resistant tests are being installed in underfloor installations. Consideration has been given to the negative comment by Mr. Ayer. This language is to make it clear that these raised floor installations will have to comply with all of 645.2 or be wired in accordance with 300.22(C).
Panel Meeting Action: Reject
Panel Statement: Raised floors with air handling capabilities for general office areas are already clearly covered by 300.22(C) and compliance with all of the requirements in 645.2 are necessary before Article 645 can be used. The existing text in Section 300.22(D) is permissive in nature, to permit the user of the NEC to either install the system in accordance with all of the requirements in 300.22(C) using acceptable wiring methods per 300.22(C) or to use the requirements in Article 645, as an alternative which relaxes some of the more stringent requirements from 300.22(C). The proposal would require that all raised floor installations for information technology rooms be installed in accordance with Article 645, even if the installer wanted to use the more stringent requirements found in 300.22(C).
Section 645.1 FPN already references NFPA 75 so an additional reference in 300.22(D) is unnecessary since anyone using Article 645 would have access to the reference to NFPA 75.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

3-90 Log #2196 NEC-P03 **Final Action: Reject**
(Table 300.50)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 3-101
Recommendation: Accept the panel action in principle. Restore the second note as written in the proposal, and the superscript "2" in Columns 1 and 2. Place the panel text for Note 2 as Note 5. Renumber the final note as Note 6.
Substantiation: There is no discrepancy between the proposal as written and Table 300.5 with respect to the 6-in. reduction in cover if there is at least 2 in. of concrete in the trench. Note 2 entered its former location as first Table 710.3(b) and then 710.4(b) in the 1990 NEC, courtesy of this submitter's Proposal 13-59. The language was based on former Table 300-5 Exception No. 1 in the 1987 NEC. This allowance was, and remains, in Table 300.5 in its second row now that the former exceptions have been included in Table 300.5. Columns 1 and 3 of this row are 6 in. less in required cover from the first row. The two affected columns cover exactly the subject of the proposed note 2 as written for this proposal. Since the proposal restructures the table using simpler column headings, there will not always be a 1:1 visual correlation with Table 300.5. The relocation of the note developed by CMP 3 nearer to the end reflects an editorial preference to place modifications of specific table information closest to the table, with the modifications affecting the entire table placed at the end.
Panel Meeting Action: Reject
Panel Statement: The old Exception No. 2 permitted a 6 inch reduction for each 2 inches of concrete placed in the trench above the underground installation, with the exception of rigid metal conduit and IMC since a reduction in depth would have placed it on top of the ground. This permission was given for over 600 volts but not permitted for under 600 volts where the reduction was only one reduction in depth even if 6 inches of concrete was placed on top of the nonmetallic raceway. This discrepancy was very plain. The panel decided to delete this exception during the rewrite to provide consistency between the two tables.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
SANDERS: The Panel Action is to Reject ROC 3-90, but it should have been Accept instead.
The Panel Action will have the effect of deleting the present permission to use a 2 inch thick concrete cover for each 6 inch of depth reduction from Table 300.50 initial burial depths for two specific wiring methods.
IEEE votes Negative in opposition to the Panel Action to Reject this Comment and instead move to Accept this Comment as submitted.
In support of my Negative vote, the following is submitted.
There have been no reports of any dig-ins resulting in injuries or fatalities submitted since the 1975 cycle when the present text was adopted.
The Panel statement first sentence is correct concerning the reduction in burial depth of direct burial cable and nonmetallic raceway not listed for direct burial of 6 inches concrete cover for each 2 inches of concrete and that RMC and IMC are indeed exempt from the 2 inch concrete cover requirement.
It is not correct that the direct burial cables and nonmetallic raceway not listed for direct burial could be placed on the surface (ground) with concrete poured over them.
This is based upon the statement made at the ROC meeting there was nothing in the present Code to prevent direct burial cable and nonmetallic raceway not listed for direct burial from conceivably being laid on the surface with concrete poured over it, such that later it could be mistaken for a sidewalk or such and subject to pickaxe or other dig-in mishaps. Research on this issue has revealed that is simply not the case. Reviewing the 2005 Draft 300.37, and back through all the Code Editions to 1968 where it was first introduced as Section 710-3(a), all these Editions clearly state that any above grade wiring method requires RMC. IMC, EMT, RNMC, cable trays, busways, cablebus, in other identified raceway, or open (exposed) runs of metal-clad cable suitable for the purpose. In locations accessible to qualified persons only, open runs of Type MV cables, bare conductors, and bare busbars shall also be permitted.
The negative comment from Mr. John A. O'Neil, Jr. US Veterans Administration in TCR 13-67 (1987 Cycle) stated the presence of concrete below grade would indicate the presence of sub-surface wiring at that location. In a similar vein, it was also stated the presence of concrete on grade would offer no indication that wiring may be present below.
To reinforce this, ROP 13-59 (1990 Cycle) Exception No. 1 was accepted and re-numbered as Exception No. 2 to Table 710-3(b), by adding the text "placed in the trench" so installers would know the highest the direct burial cables or nonmetallic raceway not listed for direct burial could rise to was the limit necessary to contain all the concrete pad, not just part of it. This was confirmed by the panel statement ROC 13-67 (1990 Cycle) the intent was to provide a minimum of 6 inches of cover in the newly numbered Exception No. 2 to Table 710-3(b).
The anecdotal story presented during the 2005 ROC discussion never presented any documentation of any workers plunging a pick-axe into the direct buried cable when at or near the surface, just that this might happen. Again, that has been shown to clearly be a violation of the NEC if these wiring methods are brought close to the surface. Drafting new requirements without any technical substantiation to address issues where the present Code is "maybe" not being followed anyway is an exercise in futility, and has not been accepted as adequate substantiation in any other proposal under CMP 3 purview.
Concerning the last sentence of the Panel Comment, it is disingenuous at best to use text no longer necessary for 600 Volt or less wiring methods as the sole reason for removing it from over 600 volt wiring methods under the guise of making them (Tables 300.5 and 300.50) look the same.
The substantiation in the Comment pointed out the apparent discrepancy issue of direct burial cable burial depths (and nonmetallic raceway not listed for direct burial) simply does not exist. The same wording on this issue for both Table 300-5 and Table 710-3(b) was introduced as Exception No. 1 during the 1975 revision cycle, and continued on in the 1978, 1981, 1984, and 1987 Editions. During the 1990 revision cycle, Table 300-5 Exception No. 1 was incorporated into Table 300.5. However, Table 710-3(b) retained the exception and moved it to Exception No. 2 with no wording change.
The supposed inequality of direct burial requirements between Tables 300.5 and 300.50 does not exist as it is so stated in the first sentence of the comment substantiation and borne out again by the review of previous National Electrical Code Editions.
Note No. 2 based upon Table 710-3(b) Exception No. 1 was not new to Article 710, and was not imported from Table 300-5, as the substantiation states in the second and third sentence. The original 1987 Edition Exception No. 1 was retained as Exception No. 2 to Table 710-3(b) for the 1990 NEC. The only change was to expressly exempt rigid metal conduit (RMC) and intermediate metal conduit (IMC) from this Exception, which had the effect of causing them to read the same, and it remained as Exception No. 2 when Section 710-3 and Table 710-3(b) were re-numbered as Section 710-4 and Table 710-4(b) for the 1993 Edition.
The submitter's fourth, fifth and sixth sentences are correct. Table 300-5 Exception No. 1 was incorporated into the second column of Table 300-5 during the 1990 revision cycle. The submitter's seventh and eighth sentences are for editorial clarification and are acceptable.

ARTICLE 310 — CONDUCTORS FOR GENERAL WIRING

6-4 Log #764 NEC-P06 **Final Action: Accept in Part**
(310.4)

Submitter: Michael J. Johnston Plano, TX
Comment on Proposal No: 6-6a
Recommendation: I would encourage the panel to reconsider its initial action on this proposal. Keep the concept and current wording "(electrically joined at both ends to form a single conductor)" in 310.4 as follows: Aluminum, copper-clad aluminum, or copper conductors of size 1/0 AWG and larger, comprising each phase, neutral, or grounded circuit conductor, shall be permitted to be connected in parallel (electrically joined at both ends to form a single conductor).
Substantiation: Removing this description of what parallel conductors are as currently described in 310.4 would result in lessening the understanding of requirements for conductors in parallel. Without a definition of the term "parallel conductors" or "conductors in parallel" in Article 100 or in 310, users lose the description as currently contained in the parenthetical text of 310.4. I respectfully encourage the panel to reconsider this action. Perhaps a definition of the term is needed. This was a panel proposal and no other substantiation was provided for removing the text other than in Proposal 6-6a.
Panel Meeting Action: Accept in Part
Revise the main paragraph of Section 310-4 to read as follows: Aluminum, copper-clad aluminum, or copper conductors of size "1/0 AWG and larger, comprising each phase, neutral, or grounded circuit conductor, shall be permitted to be connected in parallel (electrically joined at both ends)."
Panel Statement: The panel agrees with part of the submitter's recommendation to keep the parenthesized text in 310.4 (electrically joined at both ends). However the panel does not agree with the phrase "to form a single conductor" because it could cause confusion when applying 310.15(B)(2).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-5 Log #782 NEC-P06 **Final Action: Accept in Principle in Part**
(310.4)

Submitter: Michael J. Johnston Plano, TX
Comment on Proposal No: 6-6a
Recommendation: I would encourage the panel to reconsider its initial action on this proposal. Revise the current wording in 310.4 as follows: Conductors in Parallel. Aluminum, copper-clad aluminum, or copper conductors of size 1/0 AWG and larger, comprising each phase, neutral, or grounded circuit conductor, shall be permitted to be connected in parallel. Conductors in parallel shall be electrically joined at both ends to form a single conductor and shall meet the requirements of this section (1) through (5).
Substantiation: Removing this description of what parallel conductors are as currently described in 310.4 would result in lessening the understanding of requirements for conductors in parallel. Without a definition of the term "parallel conductors" or "conductors in parallel" in Article 100 or in 310, users lose the description as currently contained in the parenthetical text of 310.4. I respectfully encourage the panel to reconsider this action. Perhaps a definition of the term is needed. This was a panel proposal and no other substantiation was provided for removing the text other than in Proposal 6-6a.
Panel Meeting Action: Accept in Principle in Part
The panel rejects the added reference to items (1) through (5) because they are already part of the requirement.
Panel Statement: See panel action and statement on Comment 6-4. The panel retains the sentence structure using parentheses for clarity.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-6 Log #1588 NEC-P06 **Final Action: Accept in Principle**
(310.4)

Submitter: Alan Manche, Schneider Electric/Square D Co.
Comment on Proposal No: 6-6a
Recommendation: The panel should reconsider and reject proposal 6-6a.
Substantiation: The parenthetical phrase "(electrically joined at both ends to form a single conductor)" does provide clarity to this section. This wording was added to the 1971 NEC to enhance the clarity of parallel conductor installations. The removal of this wording will likely be interpreted that parallel conductors are not required to be joined at both ends or at least create unnecessary confusion.
The panel should consider the wording in 230.2 which states: "…underground sets of conductors, 1/0 AWG and larger, running to the same location and connected together at their supply end but not connected together at their load end shall be considered to be supplying one service."
The phrase in 310.4 provides a consistent and practical approach, as found in 230.2, in order to help the user of the code understand the requirement clearly.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-4.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-7 Log #697 NEC-P06 **Final Action: Reject**
(310.4 Exception No. 4)

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 6-7
Recommendation: Revise proposal Exception No. 4:
Under engineering supervision, grounded neutral conductors in sizes 2/0 AWG and 1 AWG shall be (delete "larger") permitted ....(remainder unchanged).
Substantiation: Since conductors 1/0 AWG and larger are already permitted in parallel per 310.10, there is no need to require engineering supervision for conductors larger than 1 AWG.
Panel Meeting Action: Reject
Panel Statement: Retaining the word "larger" maintains clarity and consistency.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-8 Log #2117 NEC-P06 **Final Action: Accept in Principle**
(310.4(6) (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-10
Recommendation: Accept the proposal.
Substantiation: The panel statement is not responsive. Referring to the installation described in the substantiation, the following four conditions are true about the conductors run in parallel:
1) They all have the same length.
2) They all have the same conductor material.
3) They are all the same size in circular mil area.
4) They all have the same insulation type.
Therefore the panel statement is incorrect, and the issue raised in the proposal deserves to be addressed. This submitter had never previously considered this type of installation, and at first believed it would probably violate something in 300.3, but a close reading of that section does not support that conclusion. The proposal is simple, straightforward, and should be accepted.
Panel Meeting Action: Accept in Principle
Revise the third paragraph of 310.4 to read as follows: "Where run in separate raceways or cables, the raceways or cables shall have the same physical characteristics. Where conductors are in separate raceways or cables, the same number of conductors shall be used in each raceway or cable. Conductors of one phase, neutral, or grounded circuit conductor shall not be required to have the same physical characteristics as those of another phase, neutral, or grounded circuit conductor to achieve balance."
Panel Statement: The panel agrees that the installation described in the proposal could cause unequal division of current. The action taken by the panel will address the submitter's concerns.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-9 Log #52 NEC-P06 **Final Action: Reject**
(310.6)

Submitter: Clifford J. Normand Milford, OH
Comment on Proposal No: 6-12
Recommendation: Leave the existing 310-6 the way it was in the existing code allowing for non-shielded cable permitted for use up to 8000 volts. If the committee feels that a change is necessary the use of non shielded cable should be permitted for use up to 5000 volts. This will allow use on 4160 volt systems.
Substantiation: My company operates several paper mills in the U.S. Some locations utilize 4160 volts for medium voltage motors. A typical mill would utilize over 150 MV motors. All of the motor feeders and MCC feeders were installed with non-shielded cables. A survey of these facilities has shown that there have not been any cable failures on cables installed in the early 1960's thru the 1980's due to lack of shielding. These cables have been installed in all types of locations in paper mills and lumber mills where the environment is less than ideal including areas of high humidity, high temperatures (over 100 deg. F), etc. Our experience does not show ANY justification for the proposed change to require shielded cables for 4160 volt applications. Economics would have long ago dictated us to convert to shielded cable if we would have experienced outages in our 24/7 operations. This proposal appears to be a

convenience item not a safety item. The additional problem of terminating shielded cable in motor wiring boxes will cause a major problem especially for modifications to existing installations with no justification in our experience for increased reliability or safety.

Panel Meeting Action: Reject

Panel Statement: It is the panel's decision that cables rated above 2400 volts be shielded. The submitter of the original proposal has provided substantiation to support the 2400 volt limitation.

While the submitter has indicated that he has not experienced problems in his facility, problems have been experienced in other installations.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Reject this comment.

The panel should have Accepted this comment and Rejected Proposal 6-12 due to insufficient substantiation. The panel has made a significant change in the Code based on the one incident provided by the submitter of Change Proposal 6-12. They have chosen to ignore the substantial satisfactory experience stated in Comments 6-9, 6-10, 6-13, 6-14, 6-19, 6-20, 6-21, and 6-22. The "Engineering Notes" from the Okinite Company dated 7/5/95 by J.R. Cancelosi provided at the panel meeting by Mr. Zimmock contains a final paragraph which states in part "Non-shielded 5 kV cable has been used successfully for many years. Its advantages of ease of splicing and terminating and smaller termination compartments will continue to make it a popular choice." The panel also chose to ignore this statement of experience with this type of 5 kV cable. The panel also ignored Mr. Wetherall's comment in his negative vote on Proposal 6-12 which stated that "However, 5 kV nonshielded cable is still being produced and no problems have been brought to UL's attention.". When properly installed, this 5 kV unshielded cable is safe and performs well. Only two comments were submitted in support of the panel action.

LIGGETT: Appropriate substantiation has not been provided to warrant the limitation of unshielded cables to 2400 volts. Only one instance was presented showing a problem. All other substantiation provided was antidotal. In the one case submitted appropriate installation practices would have solved the problem. Many comments were submitted from organizations and companies with hundreds of years of cumulative experience with no documented evidence of safety or operability problems at 4160 volts. These comments were generally made by industrial facilities that used non-sielded 5 kV cable extensively and employee trained competent personnel for the installation and maintenance of their electrical systems. Some of the substantiation in comments supporting the limitation indicated problems arising from improper installations by unqualified personnel. Any aspect of dealing with electricity is hazardous when not installed properly. The NEC cannot be written to account for improper installations made by unqualified personnel. By requiring shielding, proper installation becomes even more critical and if the installation is made by the same unqualified personnel the safety of the installation decreases. Improper termination of the shield will increase the likelihood of the installation failing. It was stated in the panel meeting that there is a problem that some equipment may not have adequate space to terminate shielded cables.

MCCLUNG: The panel should have accepted this comment or have accepted this comment in principal and granted an exception to industrial establishments for allowing the use of 5000/8000 volt non-shielded cable where the conditions of maintenance and supervision ensure that only qualified persons service the installation as was proposed by Mr. McClung's affirmative comment on Proposal 6-49 and Mr. Daly's Comment 6-17.

There was insufficient substantiation provided in Proposal 6-12 to make such a significant change in the NEC. This change was based on one installation problem provided by the submitter and supported by visual data (i.e. photographs). The problem was that arcing occurred when the individual non-shielded conductors of a three conductor (3/C) cable were separated from the overall sheath or jacket, leading to ultimate failure. This most likely occurred at a termination point and could have caused by improper installation. The submitter explained that there were numerous other instances of this type of problem, but provided no specifics beyond the one incident. Also, the submitter made an indirect reference that this type problem mainly occurs in commercial installations.

During the comment period, NFPA received 8 comments (6-9, 6-10, 6-13, 6-14, 6-19, 6-20, 6-21 and 6-22) recommending the rejection of the original proposal (Proposal 6-12). These comments were from industrial users and their substantiation showed that industry has successfully and safely used non-shielded cable for over 40 years. There were only two comments supporting the original proposal and they came from a cable manufacturer and Copper Association . No other comments were received in support. Even cable manufacturers, many or whom have individual members on the panel, could not agree on the voltage limitation of non-shielded cables (i.e. 2.4 kV, 5 kV, 8 kV) but voted in support of the panel's actions (by directed vote of sponsoring association). It was interesting to note that Mr Zimnock, who supported the original proposal, provided a copy of "Engineering Notes" from the Okonite Company dated 7/5/95 authored by Mr. J. R. Cancelosi at the panel meeting. It contained information on shielded versus non-shielded cable. In the final paragraph of the document, it stated "Non-shielded, 5 kV cable has been used successfully for many years. Its advantages of ease of splicing and terminating and smaller termination compartments will continue to make it a popular choice."

The panel chose to ignore this new information as well as Mr. Wetherell's negative comment on the Proposal 6-12 in which he stated, "I'm told that the 8 kV products is no longer produced so eliminating it should not cause any problems. However, 5 kV non-shielded cable is still being produced and no problems have been brought to UL's attention."

With this new information, the panel should reconsider their support for the original proposal (6-12) and either reject it or accept Mr.Daly's Comment 6-17 to provided an exception for industrial establishments as was suggested above by Mr. McClung in his affirmative comment to Proposal 6-49.

Another suggestion that was not considered by the panel, as expressed in Comment 6-52 by Mr. Stewart for industrial establishments, was to permit the use of 5000 volt non-shielded cables provided the insulation and jacket thickness are rated for wet locations and the cable is armored. In essence, this would require the industrial community to use the heavier wall thickness (i.e. increased insulation and jacket thickness associated with the 2001 to 5000 volt wet rating) on conductors and therefore, provide more protection against possible arcing.

As the data provided has shown, non shielded cable can be successfully and safely installed on 5 kV industrial systems. The NEC should not eliminate this practice. However, it looks like this practice has not been followed in commercial installations. This is even more of a reason to grant industrial establishments and exception. I believe this practice could be successful in commercial installations if the installers have the proper training, but as indicated by the submitter in the original proposal this does not seem to be the case in the "commercial world."

Comment on Affirmative:

ZIMNOCH: The original proposals (6-12 and 6-49) address a serious safety issue that exists in the field. When 5kV non-shielded cables are operated at 4160 volts, the outside surface of the cable is not at zero potential; a standing voltage exists. Several panel members related instances where personnel were seriously injured or killed as a result of contact with 5 kV non-shielded cables operating at 4160 volts. A current ICEA Standard includes the following. "Cables without insulation shields have electric fields that extend partially within the insulation and whatever exists between the insulation and ground. If the field is sufficiently intense, it will cause the air near the cable to ionize and form corona which can damage the cable insulation or it can cause the insulation itself to breakdown."

Other panel members stated that they had not heard of problems in the field. Not being aware of a problem does not mean one does not exist. Many end users have experienced problems.

Motor termination boxes and the like can be manufactured to accommodate shielded cable terminations, in fact, equipment manufacturers (motors, switchgear, etc.) have indicated that they do not have any problems with going to shielded cable above 2400 volts.

Due to the seriousness of this safety issue, the panel would be remiss in not correcting this known field hazard.

If the original proposals were instituted, nonshielded cables would still exist, but would be limited to 2400-volt operation.

6-10 Log #67 NEC-P06 **Final Action: Reject**
(310.6)

Submitter: Michael V. Glenn, Longview Fibre Co.

Comment on Proposal No: 6-12

Recommendation: Reject this proposal.

Substantiation: I request the panel reconsider its action on this proposal and reject this proposal based on inadequate and nonspecific substantiation and on a proven safe installation and service record for these types of installations. The submitter does not state what voltage level was present or the specifics as to what caused the arcing. It could be poor workmanship, a code violation, non-listed cable, or many other things. Our cable manufacturer states that they have not had any problems with their listed cables in these applications. In our mill, we have used 5KV non-shielded cable for 2.4KV applications consisting of several hundred motor feeders and installations with no cable problems or cable failures over the past 35 years. Our record would indicate that this practice is safe and adequate. Any panel action should be specific to the factually substantiated problem rather than an all inclusive and restrictive requirement eliminating a proven safe installation procedure. I request the panel consider all there of the negative panel member comments and reject this proposal.

Panel Meeting Action: Reject

Panel Statement: The submitter can still use the 2400 volt nonshielded cable as described in his substantiation. See panel action on Comment 6-15 regarding the removal of subparagraph (c).

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Reject this comment.

See my Explanation of Negative Vote on Comment 6-9.

LIGGETT: See my explanation of negative vote on Comment 6-9.

MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.

Comment on Affirmative:

ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-11 Log #569 NEC-P06 **Final Action: Accept**
(310.6)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-12
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the recommendation of the TCC to reconsider. See the panel action and statement on Comments 6-15 and 6-17.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-12 Log #903 NEC-P06 **Final Action: Accept**
(310.6)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 6-12
Recommendation: This is as recommended in Mr. Zimnoch's affirmative comment. As written, this applies only to 5001 - 8000 volt cables. Delete item "C".
Substantiation: The use of the currently allowed 5KV cables above 2400 volts has been and still is a problem. The cables without a jacket have a very high failure rate.
The cables with 90 mils insulation thickness and a jacket are mechanically very weak and are very subject to mechanical damage. However, if very carefully installed they will work in a dry location.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Accept this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
Comment on Affirmative:
MCCLUNG: This comment may or may not be valid depending upon whether or not the panel chooses to reverse its decision on the non-shielded cable (i.e. limit it to 2.4 kV, 5 kV or 8 kV). See my Explanation of Negative Ballot on Comment 6-9.
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-13 Log #919 NEC-P06 **Final Action: Reject**
(310.6)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 6-12
Recommendation: This proposal should have been rejected.
Substantiation: Insufficient substantiation was provided to require this change. Although the change would correct the problems illustrated in the proposal documentation, different work practices in the installation would also fix the problem without limiting a widely used and accepted installation method. This change would create other installation problems in some cases. This proposal should be rejected until further study can be done to understand the implications of this change.
Panel Meeting Action: Reject
Panel Statement: It is the panel's decision that cables rated above 2400 volts be shielded. The submitter has provided no technical substantiation to the contrary. The submitter of the original proposal has provided substantiation to support the 2400 volt limitation.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.
Comment on Affirmative:
KENT: Although there is merit to the fact that some establishments have used the cable without incident, the purpose of the code is the safeguarding of persons and property. The use of this cable has unnecessary risk in use and should be eliminated for safety concerns.
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-14 Log #1087 NEC-P06 **Final Action: Reject**
(310.6)

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute
Comment on Proposal No: 6-12
Recommendation: Reject the Proposal.
Substantiation: This proposal should have been rejected. The submitter describes an isolated instance of a problem and has not provided adequate technical substantiation that the problem as described by the submitter is common throughout the industry. Many unshielded cables are installed and operating and the experience shows this is not a widespread problem.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-13.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-15 Log #2379 NEC-P06 **Final Action: Accept**
(310.6)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 6-12
Recommendation: The Proposal should have been Accepted in Part in accordance with Zimnoch's Comment on Affirmative.
In the Exception, delete "(c)" in its entirety and renumber "(d)" as "(c)".
Substantiation: See Mr. Zimnoch's Comment on Affirmative in the ROP.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Accept this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
Comment onAffirmative:
MCCLUNG: This comment may or may not be valid depending upon whether or not the panel chooses to reverse its decision on the non-shielded cable (i.e. limit it to 2.4 kV, 5 kV or 8 kV). See my Explanation of Negative Ballot on Comment 6-9.
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-16 Log #2971 NEC-P06
(310.6)

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle" and the Technical Correlating Committee understands that Proposal 6-12 is modified by the Panel Action on Comment 6-15.
Submitter: Arthur V. Pack, Jr., The Okonite Co.
Comment on Proposal No: 6-12
Recommendation: I support the panel action to accept this proposal.
Substantiation: It is a fact that unshielded cables operating above 2000 volts have surface electrical discharge. Installation geometry and/or transient overvoltage can initiate electrical arcing. This condition is inherently unsafe. The use of shielded cables will prevent this condition.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Accept this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: The panel should have rejected this comment or accepted this comment in principle and granted an exception to industrial establishments for allowing the use of 5000/8000 volt non-shielded cable where the conditions of maintenance and supervision ensure that only qualified persons service the installation as was proposed by Mr. McClung's affirmative comment on Proposal 6-49.
See my Explanation of Negative Ballot on Comment 6-9, 2nd through 6th paragraphs for remainder of information.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-17 Log #2380 NEC-P06 **Final Action: Reject**
(310.6 and Table 310-63)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 6-49
Recommendation: The Proposals should have been Accepted in Principle in Part.
Revise 310.6 as follows:
Change the existing Exception to Exception No. 1.
Add:
Exception No. 2: In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, nonshielded cables shall be permitted up to:
(a) 5000 volts to permit terminating cable in boxes and enclosures having restricted space that does not provide sufficient space for stress relief cones.
(b) 8000 volts for leads from 13,800 volt line-to-line transformer neutrals to impedance ground devices.
(c) 8000 volts for leads from the neutral point on a 13,800 volt line-to-line transformer, generator, or zig-zag grounding transformer to an impedance ground device.
Substantiation: This proposed wording will address Mr. McClung's comment on his Affirmative vote on Proposal 6-49. The Exception is more appropriate in 310.6 rather than as a footnote to Table 310.63.
Panel Meeting Action: Reject
Panel Statement: It is the panel's decision that cables rated above 2400 volts be shielded. The submitter has provided no technical substantiation to the contrary. The submitter of the original proposal has provided substantiation to support the 2400 volt limitation.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: The panel should have accepted this comment or accepted this comment in principal and granted an exception to industrial establishments for allowing the use of 5000 volt non-shielded cable where the conditions of maintenance and supervision ensure that only qualified persons service the installation as was proposed by Mr. McClung's affirmative comment on Proposal 6-12.
See my Explanation of Negative Ballot on Comment 6-9, 2nd through 6th paragraphs for remainder of information.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-18 Log #486 NEC-P06 **Final Action: Reject**
(310.6 Exception)

Submitter: James R. Sicard, Shell Oil Co.
Comment on Proposal No: 6-49
Recommendation: The panel action should have been to reject Proposal 6-49.
Substantiation: The submitter failed to supply sufficient technical substantiation for the proposed change in proposal 6-12, therefore, the changes to Table 310.63 should also be rejected. A large petrochemical company that has industrial facilities located throughout the United States has installed 5Kv nonshielded cable at 4160 volts in those industrial facilities for over 20 years. This petrochemical company does not have any history of 5Kv cable failures relating to the cable being nonshielded. A safe and reliable installation of 5Kv nonshielded cable can be achieved through work practices that result in proper installation and termination of this cable. The submitter failed to supply sufficient technical substantiation for the proposed change. (See companion comment on Proposal 6-12).
Panel Meeting Action: Reject
Panel Statement: It is the panel's decision that cables rated above 2400 volts be shielded. The submitter of the original proposal has provided substantiation to support the 2400 volt limitation.
While the submitter has indicated that he has not experienced problems in his facility, there have been problems experienced in other installations.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: The panel should have accepted this comment or have accepted this comment in principal and granted an exception to industrial establishments for allowing the use of 5000/8000 volt non-shielded cable where the conditions of maintenance and supervision ensure that only qualified persons service the installation as was proposed by Mr. McClung's affirmative comment on Proposal 6-49. This would have kept the 2001 to 5000 or 5001 to 8001 volt columns in Table 310.63 as they appear in the 2002 NEC.
There was insufficient substantiation provided in Proposals 6-12 and 6-49 to make such a significant change in the NEC. This change was based on one installation problem provided by the submitter and supported by visual data (i.e. photographs). The problem was that arcing occurred when the individual non-shielded conductors of a three conductor (3/C) cable were separated from the overall sheath or jacket, leading to ultimate failure. This most likely occurred at a termination point and could have caused by improper installation. The submitter explained that there were numerous other instances of this type of problem, but provided no specifics beyond the one incident. Also, the submitter made an indirect reference that this type problem mainly occurs in commercial installations.
During the comment period, NFPA received 8 comments (6-18, 6-48, 6-49, 6-50, 6-51, 6-52, 6-53, and 6-54) recommending the rejection of the original proposal (Proposal 6-49). These comments were from industrial users and their substantiation showed that industry has successfully and safely used non-shielded cable for over 40 years. There was only one comment supporting the original proposal. Even cable manufacturers, many or whom have individual members on the panel, could not agree on the voltage limitation of non-shielded cables (i.e. 2.4 kV, 5 kV, 8 kV) but voted in support of the panel's actions (by directed vote of sponsoring association). It was interesting to note that Mr Zimnock, who supported the original proposal, provided a copy of "Engineering Notes" from the Okonite Company dated 7/5/95 authored by Mr. J. R. Cancelosi at the panel meeting. It contained information on shielded versus non-shielded cable. In the final paragraph of the document, it stated "Non-shielded, 5 kV cable has been used successfully for many years. Its advantages of ease of splicing and terminating and smaller termination compartments will continue to make it a popular choice."
The panel chose to ignore this new information as well as Mr. Wetherell's negative comment on the Proposal 6-12 in which he stated, "I'm told that the 8 kV products is no longer produced so eliminating it should not cause any problems. However, 5 kV non-shielded cable is still being produced and no problems have been brought to UL's attention."
With this new information, the panel should reconsider their support for the original proposal (6-49) and reject it and provided an exception for industrial establishments as was suggested above by Mr. McClung in his affirmative comment to Proposal 6-49.
Another suggestion that was not considered by the panel was to eliminate the 2001-5000 Volt, Dry Location, Single Conductor (insulation and jacket thickness) columns and the Wet or Dry Locations Multi-conductor Insulation* from Table 310.63 (i.e. eliminate the 90 mil wall non-shielded cable constructions). This would require all non shielded cables to have the heavier wall thickness (i.e. wet or dry location single conductor insulation thickness) and therefore provide more protection against possible arcing.
As the data provided has shown, non shielded cable can be successfully and safely installed on 5 kV industrial systems. The NEC should not eliminate this practice. However, it looks like this practice has not been followed in commercial installations. This is even more of a reason to grant industrial establishments and exception. I believe this practice could be successful in commercial installations if the installers have the proper training, but as indicated by the submitter in the original proposal this does not seem to be the case in the "commercial world."
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-19 Log #487 NEC-P06 **Final Action: Reject**
(310.6 Exception)

Submitter: James R. Sicard, Shell Oil Co.
Comment on Proposal No: 6-12
Recommendation: The panel action should have been to reject Proposal 6-12.
Substantiation: A large petrochemical company that has industrial facilities located throughout the United States has installed 5Kv nonshielded cable at 4160 volts in those industrial facilities for over 20 years. This petrochemical company does not have any history of 5Kv cable failures relating to the cable being nonshielded. A safe and reliable installation of 5Kv nonshielded cable can be achieved through work practices that result in proper installation and termination of this cable. The submitter failed to supply sufficient technical substantiation for the proposed change.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-9.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-20 Log #522 NEC-P06 **Final Action: Reject**
(310.6 Exception)

Submitter: David Soffrin, American Petroleum Institute
Comment on Proposal No: 6-12
Recommendation: The panel action should have been to reject Proposal 6-12.
Substantiation: The submitter failed to supply sufficient technical substantiation for the proposed change. Companies within the petroleum and chemical industry have over 20 years of successful history using unshielded 5kV Type MC cable on 2400V and 4160V distribution systems and utilization equipment. Proper routing and termination techniques are required for both shielded and unshielded cable in order to obtain a safe and reliable installation. The submitter failed to demonstrate why the absence of a shield at 4kV has resulted in widespread cable failure throughout the industry.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-9.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-21 Log #733 NEC-P06 **Final Action: Reject**
(310.6 Exception)

Submitter: Steven Kovacs, ConocoPhillips - Bayway Refinery
Comment on Proposal No: 6-12
Recommendation: The panel action should have been to reject Proposal 6-12.
Substantiation: The submitter failed to supply sufficient technical substantiation for the proposed change. Unshielded 5kV cables have been used successfully in the petroleum industry since the late 40's. At this Refinery, we have over 40 years of successful history using unshielded 5kV cables on 2400V and 4160V distribution systems and utilization equipment, without the type of problems the submitter states. The substantiation states that "Commercial specifiers, etc." This seems to indicate that this problem is in the commercial application, not in industrial applications. Proper installation techniques are required for both shielded and unshielded cables to obtain a safe and reliable installation. The submitter did not demonstrate that the absence of a shield at 5kV has resulted in widespread cable failures throughout the industry.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-9.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.
Comment onAffirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-22 Log #3636 NEC-P06 **Final Action: Reject**
(310.6 Exception)

Submitter: Paul E. Guidry, Fluor Daniel, Inc.
Comment on Proposal No: 6-12
Recommendation: This proposal should have been rejected. There was insufficient substantiation provided.
If any changes are made, I support the move to revise references to 8KV - change to 5KV.
Substantiation: Unshielded cable used at the SKV level has been used for many years with a very good track record. I believe the motivation behind the proposal is a commercial issue - not a safety issue as the submitter claimed. The UL representative, Mr. Wetherell, also noted in his comment that no problems have been brought to UL's attention.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-13.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-9.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-23 Log #1137 NEC-P06 **Final Action: Accept in Principle in Part**
(310.8(D))

Submitter: Paul Dobrowsky Holley, NY
Comment on Proposal No: 6-13
Recommendation: Reconsider the modification made to 310.8(D)(3) and use the language provided in the proposal.
Substantiation: The revision raises a question regarding listed for the application. Which application? Presently available commonly used electrically insulating tape is available that is sunlight resistant. It is also suitable for use outdoors.
If only non listed sleeving exists then an existing product could be evaluated and listed or one could be developed. Removing the term would delay being able to use a product after it was listed for the use.
Panel Meeting Action: Accept in Principle in Part
Revise 310.8(D) to read as follows:"Locations Exposed to Direct Sunlight. Insulated conductors or cables used where exposed to direct rays of the sun shall comply with one of the following:
(1) Cables listed, or listed and marked, as being sunlight resistant
(2) Conductors listed, or listed and marked, as being sunlight resistant.
(3) Covered with insulating material, such as tape or sleeving, that is listed, or listed and marked, as being sunlight resistant."
Panel Statement: The revised wording addresses the submitter's comment and provides greater clarity. The panel rejects the use of the word "identified" to maintain consistency with the terms used in the current Code.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-24 Log #2120 NEC-P06 **Final Action: Accept in Principle**
(310.8(D))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-13
Recommendation: Accept the panel action in principle. Revise as follows:
Insulated conductors and cables exposed to direct rays of the sun shall meet not less than one of the conditions in (1) through (3):
(1) Cables and their enclosed conductors listed for sunlight resistance
(2) Conductors listed and marked as sunlight resistant
(3) Conductors or cables covered with tape or sleeving that is listed for the application and identified as being weather resistant.
Substantiation: The panel action includes the terminology "the following" while the Style Manual discourages the use of prepositions to refer to text locations, in preference to actual citations. The first list item is modified to take into account the comments in the voting. The second item restores the term "marked" which is correct in this context. The word "identified" has to be understood in the context of the Article 100 definition, which in this context, adds nothing to the requirement for a listing. It is used correctly in item (3), where the UL Green Book provides the necessary information. In the case of individual conductors, it appears the panel wants a visual indication of suitability, and that would be a factory applied marking. Item 3 was reworded to exclude the wording "such as", which is frowned on in the Style Manual.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-23.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-25 Log #2381 NEC-P06 **Final Action: Accept in Principle**
(310.8(D))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 6-13
Recommendation: I agree with the Panel Action to Accept in Principle in Part but incorporate the comments made in the voting.
Revise 310.8(D) to read:
(D) Locations Exposed to Direct Sunlight. Insulated conductors and cables used where exposed to direct rays of the sun shall be listed and identified as being sunlight resistant or covered with insulating material, such as tape, that is listed for the application and identified as being weather resistant.
Substantiation: I have incorporated the comments made in the voting by Edwards and Wetherell.
A list is not necessary. The wording proposed above would require all insulated conductors and cables that are exposed to the direct rays of the sun to be listed and identified as being sunlight resistant. This would also include the individual conductors in a cable if they are going to be exposed to the sun.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-23.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-26 Log #2867 NEC-P06 **Final Action: Reject**
(310.10, FPN 2)

Submitter: Brandon Wiltse Tampa, FL
Comment on Proposal No: 6-15
Recommendation: Accept this proposal in principle and add a new fine print note number 2 to 310.10.

FPN No. 2: See Annex H for information on conductor heating and temperature limits under short-circuit conditions.

Create a new Annex H and move the remainer of the proposed text and the substantiation as revised into a new Annex H.
Move the remaining text of the proposal and the substantiations as revised into a new annex H.

Annex H Conductor Heating and Temperature Limits under Short-Circuit Conditions. This annex is not a part of the requirements of this code but is included for informational purposes only.

There are numerous locations throughout the NEC that remind or require the safe application of conductors so that their ~~short-circuit~~ (temperature ratings) are not exceeded. These locations include but are not limited to 110.10; 240.1 FPN; 240.92(B)(1)(3); 240.92(D); 240.100(A); 240.100(C); 250.4(A)(5); 250.4(B)(4); and Table 250.122 Note. The following ~~physics~~ formulas ~~submitted with this proposal~~ are provided as a guide for the performance of conductors under short circuits conditions. These formulas represent ~~are~~ the accepted basis for conductor short-circuit temperatures throughout the world. They are found in the ANSI/IEEE Red, Gray, Buff and Blue Books and in the Canadian Electrical Code. Similar versions of these formulas are found in IEC60204-1 (IEC Machinery Standard), SAE HS-1738 (Automotive Industry Machinery Standard), and IEC 60364-4-43 (Installation Standard). ~~The NEC is only major installation guide throughout the world that does not supply its reader with these necessary physics formulas so that cables can be applied within their short-circuit (temperature) limitations. Let's catch up with the rest of the world and provide this information for the users of the NEC.~~

Conductor heating under short-circuit conditions is determined by (1) or (2):

(1) Short-Circuit Formula for Copper Conductors

$(Is/As)t=0{,}0297 \log 10 ((T_2 +234)/(T_1 + 234)$

where

I = short-circuit current in amperes
A = conductor area in circular mils
t = time of short-circuit in seconds
T_1 = initial conductor temperature in degrees Celsius
T_2 = final conductor temperature in degrees Celsius
Copper conductor with paper, rubber, varnished cloth insulation $T_2 = 200$
Copper conductor with thermoplastic insulation $T_2 = 150$
Copper conductor with crosslinked polyethylene insulation $T_2 = 250$
Copper conductor with ethylene propylene rubber insulation $T_2 = 250$

(2) Short-Circuit Formula for Aluminum Conductors

$I^2/A^2t = 0{,}0125 \log 10 ((T_2 + 228)/(T_1 + 228))$

where

= short circuit current in amperes
A = conductor area in circular mils
t = time of short-circuit in seconds
T_1 = initial conductor temperature in degrees Celsius
T_2 = final conductor temperature in degrees Celsius
Aluminum conductor with paper, rubber, varnished cloth insulation $T_2 = 200$
Aluminum conductor with thermoplastic Insulation $T_2 = 150$
Aluminum conductor with crosslinked polyethylene Insulation $T_2 = 250$
Aluminum conductor with ethylene propylene rubber insulation $T_2 = 250$

Substantiation: Recognizing the importance of this information and the desire of the panel not to place these formulas into the requirements of 310.10, the original proposal was revised to recommend placement of the material in a new Annex H.

The FPN was added to inform the user of the location of the new annex material.

The lead paragraph, in the proposed Annex H, is a revised version of the substantiation provided in the original proposal and, therefore, received public review. The title and lead statement for proposed Annex H was provided to comply with the NEC style manual.

Panel Meeting Action: Reject
Panel Statement: The information that the submitter proposes to have placed in the NEC, as the submitter has stated, is found in other sources, but it would not be appropriate for placement in the NEC because the NEC is not intended to be used as a design manual.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-27 Log #2411 NEC-P06 **Final Action: Reject**
(310.11(A)(6) (New))

Submitter: Leif O. Pihl, IBEW LU 292
Comment on Proposal No: 6-16
Recommendation: Since the Code Making Panel feels that multiconductor cables are so difficult to mark with the conductor's colors, this is an easy fix: Change the Proposal's Exception No. 2 to No. 3, Change the Proposal's Exception No. 1 to No. 2, and add a new Exception No. 1, so that the text will read as follows:

(6) Color of the insulation, as a full word or as an abbreviation.

Tracer color(s) shall follow the primary color, separated by a slash ('/') or an equivalent separation.

Exception No. 1: The color is not required to be marked on the outer jacket of multiconductor cables.

Exception No. 2: A conductor's tracer's color label is not required if the primary color is green and the tracer color is yellow.

Exception No. 3: A conductor's tracer's color label is not required if the tracer color is only black or only white.

FPN: Below are some examples of possible color labels, including the full name, a possible abbreviation, and an example primary color with a tracer color.

BLACK, [BLK.], <BLK/ORG>,
WHITE, [WHT], <WHT/ORG>,
RED, [RED], <RED/ORG>,
BLUE, [BLU], <BLU/ORG>,
GREEN, [GRN], <GRN/ORG>,
YELLOW, [YEL], <YEL/ORG>,
ORANGE, [ORG], <ORG/PRP>,
BROWN, [BRN], <BRN/ORG>,
PURPLE, [PRP], <PRP/ORG>,
PINK, [PNK], <PNK/ORG>,
GRAY, [GRY], <GRY/ORG>,
TAN, [TAN], <TAN/ORG>.

Substantiation: I say the following with no intended sarcasm, this is most sincere: Thank you for placing such a mimimal objection to this proposal's acceptance. I hope the above revision meets with your approval, and the revision is accepted. From just the stories I alone have heard, misidentification of conductor insulation color is a significant safety issue, I look forward to this problem being fixed.
On a different issue, the Panel's Statement of "In addition, alternative markings are available from manufacturers upon request" does not make any sense at all. By the time that the insulation's color marking is needed, the opportunity to special-order specially marked conductors is long gone into the distant past. "Alternative Markings" do not increase safety; the use of color markings need to be standard across all conductors.
Panel Meeting Action: Reject
Panel Statement: The submitter has identified a potential issue that certainly can be a problem in some cases. Marking the color on the insulation may not correct the problem identified by the submitter. The panel's statement of the original proposal pointed out that there are alternative methods of identification for conductors as a solution for this problem.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-28 Log #149 NEC-P06 **Final Action: Reject**
(310.12)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 6-18
Recommendation: Accept with one tweak:
Replace "~~According to~~" with "in the same manner as an equipment grounding conductor, as specified in".
Substantiation: The submitter has a valid point. He also is not unaware that 250.119 presently applies only to grounding conductors, not grounding electrode conductors. I hope my tweak will satisfy any concerns about confusion that might create. I don't believe the CMP considers it harmful to color a GEC green. However, I have been forbidden to do so by an Authority Having Jurisdiction, based on 250.119 plus the lack of explicit NEC permission to do so. As to location in 250.64, with conductor installation rules, rather than 310.12 with conductor identification, that's up to the Technical Correlating Committee.
Panel Meeting Action: Reject
Panel Statement: Requirements for identification of grounding electrode conductors are contained in Article 250.

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

6-29 Log #148 NEC-P06 **Final Action: Hold**
(310.12(C))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 6-20
Recommendation: Delete "~~in any manner~~" and add "Exception: Where all conductors in an enclosure are the same size and insulation type, a white conductor shall be permitted to be reidentified as a non-grounded conductor without regard to 310.11(B)(1)."
Substantiation: In this circumstance, loss of the markings will produce no hazard. Contrariwise, if the section of wire that happens to be available in the enclosure happens to be the portion containing the markings, it could be unnecessarily burdensome on installers to have to re-pull in order to avoid an apparent conflict between the two NEC sections (presuming small-gage conductors).
Panel Meeting Action: Hold
Panel Statement: The panel is holding the comment for further study because it presents new material that has not had public review.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-30 Log #700 NEC-P06 **Final Action: Accept in Principle**
(310.13)

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 6-21
Recommendation: Accept proposal as revised:
These conductors shall be permitted for use in any of the wiring methods recognized as suitable, in ~~Chapter 3~~ this code and as specified in their respective tables.
Substantiation: Chapter 3 wiring methods do not cover individual conductors installed as separate overhead conductors in accordance with 225.6; 300.37; 527.4(C) Exception. Panel Statement for Proposal 3-7 on Section 300.3(A) Exception (New) agreed that overhead spans without a messenger support are not covered in Chapter 3. some of the conductors in Table 310.13 are suitable for this use.
Panel Meeting Action: Accept in Principle
Revise the second paragraph of 310.13 to read as follows:
"These conductors shall be permitted for use in any of the wiring methods recognized in Chapter 3 and as specified in their respective tables or as permitted elsewhere in this Code."
Panel Statement: Adding the words "or as permitted elsewhere in this Code" addresses the concerns of the submitter with regard to overhead spans.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-31 Log #1298 NEC-P06 **Final Action: Reject**
(Table 310.13)

Submitter: David Sroka Turner Falls, MA
Comment on Proposal No: 6-26
Recommendation: Add to Table 310-13:
"Trade Name - Thermal Rated, Ceramifiable.
Type Letter - RHH.
(Note: Middle of the table should be submitted by the manufacturer.)
Outer Covering - EMT or rigid galvanized steel conduit."
Substantiation: I respectfully ask the panel to reconsider their position that Thermal-Rated RHH is best addressed in Chapters 5 through 7.
Having the new type RHH in the same table as MI seems very appropriate for comparison purposes. Especially, since this cable is seeing more and more usage. It is obviously not the same as MI cable and the differences should be readily available in the code.
Also, note that even though the table is in "General Wiring", MI cable has a note for "Special Applications" use. Refer also to Table Note 2.
Panel Meeting Action: Reject
Panel Statement: Type RHH conductors are already included in the table. Special characteristics of the materials can be addressed as an optional marking of the conductor. Refer to 310.11(D), which addresses optional marking.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

(Note: The sequence no. 6-32 was not used)

6-33 Log #2121 NEC-P06 **Final Action: Accept**
(Table 310.13)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-23
Recommendation: Reject the proposal.
Substantiation: This application almost certainly refers to wiring within open spaces of equipment, because it is never used for open wiring on insulators. As such is it unlikely to be "exposed" as defined in Article 100. The only substantiation for this proposal was a cookie-cutter generic argument made in a blizzard of proposals throughout the Code. This particular usage should have specific, detailed substantiation before being changed.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-34 Log #17 NEC-P06 **Final Action: Accept in Principle**
(Table 310.15, 310.18)

Submitter: Stanley J. Folz, Folz Electric, Inc.
Comment on Proposal No: 6-45
Recommendation: The panel should reconsider and reject this proposal.
Substantiation: I commend the submitter for his in-depth testing. However, this testing was performed in Las Vegas, Nevada. I would recommend that the submitter take his findings to the local Authority Having Jurisdiction and have the local electrical ordinance modified to include his findings. The panel and submitter have to know that the NEC is an international code and the conditions that rooftop conductors experience are extremely varied the world over. To set a standard that most likely will provide increased safety in the Southwest would provide no additional safety in Alaska.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-37.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
MCCLUNG: See my Explanation of Negative Vote on Comment 6-37.

6-35 Log #2382 NEC-P06 **Final Action: Accept**
(310-15(B)(2)(a))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 6-31
Recommendation: The Proposal should continue to be rejected.
Substantiation: CMP 7 has addressed the issue in accepting Proposal 7-150a.
If CMP 6 decides to Accept the Proposal, they need to review the CMP actions on Proposals 1-67 (Rejected) and 15-73 (Accepted) which would move the definition of "bundled" from 520.2 to Article 100. This definition is not appropriate for 310.15(B)(2)(a).
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-36 Log #3231 NEC-P06 **Final Action: Accept**
(310.15(B)(2)a.)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 6-31
Recommendation: The Panel should continue to reject this proposal.
Substantiation: Article 334.80 clearly defines the requirements for "ampacity" ratings of types NM, NMC, and NMS non-metallic sheath cable. Any stipulations associated with non-metallic sheath cable should be contained in this article. To begin listing requirements for specific cable types under article 310.15 in lieu of the article in which the cable type is expressly addressed, will create confusion and unduly lengthen article 310. Furthermore, with the concealed installation methods typically associated with non-metallic sheathed it would create the potential to allow greater ampacities to be impressed upon the cable then the installer intended or code allows. There is no way of knowing or being aware of cables being imbedded or surrounded by thermal insulation. Therefore, the only prudent option is to derate non-metallic sheath cable based on the 60-degree ampacity for all applications. This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-37 Log #3637 NEC-P06 **Final Action: Accept in Principle**
(310-15(B)(2)(c))

Note: The Technical Correlating Committee directs that FPN No. 2 be revised to read as follows:
"FPN No. 2: Conductors installed in conduit exposed to direct sunlight in close proximity to rooftops have been shown, under certain conditions, to experience a temperature rise of 17 degrees C (30 degrees F) above ambient temperature on which the ampacity is based."
The Technical Correlating Committee is concerned that a reference to an unnamed study would create confusion.
Submitter: Joel A. Rencsok, Three Phase Engineering
Comment on Proposal No: 6-45
Recommendation: New Section 310.15(B)(2)(c) should be deleted.
Substantiation: The panel has not studied the problems this addition will create. Equipment manufactured today will not allow a 17°C increase in ambient derate: ie Arizona is 45°C ambient. Add 17°C to this we have 62°C requirement to derate the conductors. At 75°C 500 kcmil - 380 A derate required = 33 percent = 125.4 ampere are you sure you want this. If 90°C allowed: = 58 percent = 250 A.
Panel Meeting Action: Accept in Principle
Delete new 310.15(B)(2)(c) of the panel meeting action in Proposal 6-45.
Add a new FPN No. 2 to 310.10 to read as follows: "FPN No. 2: One study has shown that conductors installed in conduit exposed to direct sunlight in close proximity to rooftops can experience a temperature rise of 17 degrees C (30 degrees F) above ambient temperature on which the ampacity is based." Renumber the existing FPN as FPN No. 1.
Panel Statement: While recognizing the study presented to the panel indicates potential for a problem, a more extensive study and evidence needs to be presented before requirements can be added to the Code to address this concern. The panel has chosen to add an FPN instead of a requirement.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: The comment should have been accepted. Proposal 6-45 should have been rejected completely. Insufficient substantiation has been provided for the addition of the FPN. One study with limited variations in the conditions does not provide ample justification for this addition. If there is a problem, then a fact-finding study should be conducted to determine the extent of the problem. The FPN will lead to confusion in the field.
MCCLUNG: The panel action to accept comment 6-37 in principle and to delete new Section 310-15(B)(2)(c) [created in the proposal stage] and replace it with a new FPN No. 2 to 310.10 was a step in the right direction. However, the panel action should have been to accept comment 6-37, period, thus eliminating any requirement or reference to requirement for adding 17°C to the ambient temperature when conductors are installed in raceways outdoor or on rooftops that are exposed to the direct sunlight.
The action to include even a fine print note based on a single installation study case (i.e. conduit installed within 0.5 inches of a black rooftop in Las Vegas, NV) is flawed. The study did not consider other type installations on rooftops, different types or color of rooftops; conduit installed a greater distance away for the rooftop or in different location across the country. Even though the submitter explained that you could develop corollary data for other locations in the country based on this test, the fact is, no other data was provided except the data in this single study. The panel felt that this study indicated a potential problem but no long term effects such as the degradation of the conductors or other failures were included in the study. In essence, there needs to be more extensive testing done including the long term aging effect on the conductors before an assessment can be made and the proper ambient temperature addition (i.e. conductor de-rating) applied. The wording in the proposed Section 310-15(B)(2)(c) and in the FPN may cause unnecessary de-rating and thus, requiring the use of larger conductors.
Ampacity de-rating factors for ambient temperatures other that those that the tables are based are already included in the NEC. It falls to the design community to make proper application.
Inserting this type language (as proposed by the panel action) into the NEC, based on a single data point, is setting a bad precedence for future cycles.
Comment on Affirmative:
KENT: Although I recognize there is an issue with solar heating, it is true the study presented was only for one geographical location. The determination of time and temperature factors needs to be studied further if this is to become code text. I support the Fine Print Note to this section to call attention to the fact that solar heating of conduits is something all installers should consider when installing conduits in direct sunlight.
ZIMNOCH: The effect of solar heating of raceways on rooftops should not be overlooked. The current ampacity tables for cables in air do not take solar heating into account. Additional heat in raceways accelerates the degradation of wire and cable insulation, which shortens life and jeopardizes reliability.
Some comments addressed the fact that the study was done in Las Vegas and does not apply to other areas of the country. IEEE 835-1994 "IEEE Standard Power Cable Ampacity Tables" uses a factor of 95 watts per square foot for horizontal installations and 65 watts per square foot or vertical, regardless of the installation's location. It also lists various emissivity and absorptivity for cable jackets and raceway types. The research presented to the panel verifies these factors.
Additionally the increased heat measured in the raceways occurs in a matter of hours, thus making it applicable to all rooftop applications that are not shaded.

6-38 Log #696 NEC-P06 **Final Action: Reject**
(310.15(B)(3))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 6-35
Recommendation: Accept proposal as revised:
For the purpose of determining their allowable imparity, individual bare or covered conductors contained in a raceway, ~~cable~~ auxiliary gutter, or cable tray with insulated conductors shall be considered to have a temperature rating equal to the lowest temperature rating of the insulated conductors.
Substantiation: For overhead individual conductors present wording limits ampacity to those of the insulated conductors. A bare copper 6 AWG installed and overhead individual insulated copper conductors 6 AWG 90 c has an ampacity of 80 per Table 310.17 or 155 where the insulated conductors are Type Z per Table 310.19. Table 310.21 indicates the ampacity of a bare 6 AWG copper conductor in free air is 124 amperes. The present wording requires a bare 500 kcmil copper service conductor installed with 350 kcmil insulated ungrounded aluminum conductors, to compensate for harmonic currents, to be limited to the ampacity of the 350 kcmil conductors.
Panel Meeting Action: Reject
Panel Statement: The current text is clear. This provision applies to applications other than those included in the recommendation. The substantiation of overhead conductors does not apply in auxiliary gutters, raceways, or cable tray.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-39 Log #2123 NEC-P06 **Final Action: Accept**
(310.15(B)(6))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-38
Recommendation: Continue to reject the proposal.
Substantiation: One technical assumption underlying this code provision is derived from the inherent conductor loading limitations on true single-phase distributions. Although there will be three current carrying conductors, the actual current flowing (and I2R heating) can never exceed full-load current loading on two conductors. Either full current will flow from one line to neutral, or from line to line. As current flows line to neutral from both lines, it cancels in the neutral. For example, on a 100A circuit operating 120/240V, the worst case heating is given by either 100A in Line 1 or 2 and 100A in the neutral, or 100A line to line. If all the load is line to neutral, then the worst case is still two conductors (lines 1 and 2, 100A each, with 0A net in the neutral). If there is some of each, the result can't exceed two full conductors. For example, 50A line 1 to neutral and 50A line to line results in 100A line 1, 50A neutral, and 50A line 2. 50A on two lines produces less heat than 100A on one line because heating is a function of current squared.
On the other hand, a feeder consisting of two phase conductors and a neutral originating in a three-phase wye distribution will always have a heavily loaded neutral, which is why it must always be counted in mutual conductor heating considerations, per 310.15(B)(4)(b). One way to look at this code provision is as a bonus over Table 310.16 values based on what will be the heating effect of only two current-carrying conductors. This assumption is completely invalid on three-phase wye distributions.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-40 Log #2130 NEC-P06 **Final Action: Hold**
(310.15(B)(6))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-41
Recommendation: Accept the panel action in principle. Clarify the permissible application of the multiple feeder allowances as one of the following four options:
1) "… the main power feeder shall include the feeder(s) serving only loads associated with a single dwelling unit and running to but not originating in the lighting and appliance branch-circuit panelboard(s) serving the dwelling unit." OR
2) "… the main power feeder shall include the feeder(s) serving only loads associated with a single dwelling unit and running to the lighting and appliance branch-circuit panelboard(s) serving the dwelling unit." OR
3) "… the main power feeder shall include the feeder(s) serving only dwelling loads and running between the main disconnect and the lighting and appliance branch-circuit panelboard(s) serving the dwelling unit." OR
4) "… the main power feeder shall include the feeder(s) serving only dwelling loads and running to but not originating in the lighting and appliance branch-circuit panelboard(s) serving a particular dwelling unit."

Substantiation: By clarifying that this note applies to dwelling units within multifamily housing, which is well advised, the proposal raises important questions as to exactly which panelboard feeders are within the scope of this allowance. Options 1 and 2 exclude feeders that are comprised of dwelling loads, but that serve multiple dwelling units. Options 3 and 4 allow such a feeder. Options 1 and 2 as a group and options 3 and 4 as a group sort out whether this allowance applies to subpanel feeders within a dwelling unit. Dwelling unit subpanel loads do not present the same diversity as dwelling unit panels serving the entire dwelling unit, and thereby undercut one of the traditional supporting assumptions underlying these allowances. However, all of these interpretations are possible given the ambiguous "(s)" endings on the word "feeder" and "panelboard." CMP 6 needs to clarify exactly which feeders qualify for this allowance.
Panel Meeting Action: Hold
Panel Statement: The panel is holding the comment for further study, because it presents new material that has not had public review.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-41 Log #3038 NEC-P06 **Final Action: Accept**
(310.16)

Submitter: David Brender, Copper Development Assn. Inc.
Comment on Proposal No: 6-12
Recommendation: This comment is submitted in support of the Panel Action. Panel member Komassa states that "this is not a widespread problem." The word "widespread" is subjective, but beyond this phrase, statements made to me by three leading manufacturers of unshielded MV cable state that they have, indeed, experienced arcing and damage. Some personnel injury may have resulted. Generally, the manufacturers do not publicize these events. Similarly, Mr. Wetherell's comment may be factually true, but does not reflect actual field experience, as few of these incidents are reported. Manufacturers make unshielded MV cable because their competition does, and they do not want to lose a bid. Lack of shielding is a safety problem recognized by manufacturers, and not correctable by maintenance and supervision. This Panel can correct this safety problem.
Substantiation: Conversations with several leading cable manufacturers have indicated a widespread, but generally unreported problem with unshielded MV cable. The manufacturers are reluctant to cite specific numbers or instances. There is a safety problem in the field, recognized by several manufacturers of the affected product, that can be addressed and corrected by this Panel.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Accept this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-9.
MCCLUNG: The panel should have rejected this comment or accepted this comment in principle and granted an exception to industrial establishments for allowing the use of 5000/8000 volt non-shielded cable where the conditions of maintenance and supervision ensure that only qualified persons service the installation as was proposed by Mr. McClung's affirmative comment on Proposal 6-49
See my Explanation of Negative Ballot on Comment 6-9, 2nd through 6th paragraphs for remainder of information.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-42 Log #2131 NEC-P06 **Final Action: Accept in Principle**
(Table 310.16, 310.17, 310.18, 310.19)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-45
Recommendation: Reject the proposal.
Substantiation: If the supporting substantiation for this proposal supported a generic temperature adder for raceways and cable assemblies located in direct sunlight, it would be very useful. However, the research was confined to a raceway spaced _ in. from a rooftop, which means that a substantial portion of the thermal gain probably occurred because of convective heating from the roof surface. The results that would be obtained from an increased spacing would probably differ significantly. The proposal submitter is to be congratulated on raising an important issue, but incorporating this in the NEC at this time is overly simplistic and requires further research.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-37.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Ballot on Comment 6-37.
Comment onAffirmative:
ZIMNOCH: See my comment on affirmative on Commen 6-37.

6-43 Log #2061 NEC-P06 **Final Action: Accept in Principle**
(310.16, Table 310-17, Table 310-18 and Table 310-19)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 6-45
Recommendation: This proposal should be rejected.
Substantiation: The Steel Tube Institute supports the concepts and principals of appropriate conductor de-rating, but does not find this proposal as stated to be adequately substantiated. In addition, the text has broad application and the specific requirement is likely not justified nationwide.
The specific use of 30º F as the temperature increase nationally is based on an experiment in one location (one of the hottest in the nation). The experiment was at one unique location with a narrow range of materials. Logic would dictate that the degree of thermal increase inside of a raceway is dependent on the size of the raceway, its materials, number of conductors, mounting, location – both environmental and geographic, installation orientation, whether it is painted, and perhaps other variables. This wide variety of conditions has not been documented. A third-party testing program with specific, repeatable criteria would be required to substantiate this proposal.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-37.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-37.
Comment on Affirmative:
ZIMNOCH: See my comment on affirmative on Commen 6-37.

6-44 Log #920 NEC-P06 **Final Action: Accept in Principle**
(Table 310.16, Table 310-17, Table 310-18 & Table 310-19)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 6-45
Recommendation: This proposal should be rejected.
Substantiation: The testing was not conducted on all raceway installation methods on rooftops. Not all raceways are installed within 1/2 in. of the rooftop. Raceways installed a distance greater than 1/2 in. may not be impacted as the ones tested. The type of roof and the color of the rooftop would impact the results of the test. Sufficient testing has not been performed and test data has not been provided to require change for all raceways on rooftops where exposed to direct sunlight. The wording proposed by the panel would require derating where it is unnecessary. No fact finding study has been produced to justify this change. Nor has any NRTL been involved in any study to verify the results of the experimentation mentioned in the proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-37.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-37.
Comment on Affirmative:
ZIMNOCH: See my comment on affirmative on Commen 6-37.

6-45 Log #68 NEC-P06 **Final Action: Accept in Principle**
(Table 310.16, Table 310.17, Table 310.18)

Submitter: Michael V. Glenn, Longview Fibre Co.
Comment on Proposal No: 6-45
Recommendation: Reject this proposal.
Substantiation: I request the panel reconsider its action on this proposal and reject this proposal based on inadequate and nonspecific substantiation and on a proven safe installation and service record for these types of installations. The submitter's comment that "recent experimentation shows that a significant temperature rise can be expected for any conductor within a conduit installed outdoors in direct sunlight. Data indicates that a rise of 30 F (17 C) can be expected for bright metal conduits in direct sun. Where this temperature rise is disregarded it could lead to overloaded conductors. Currently NEC does not address temperature rise from solar exposure." is not supported by substantiated case studies or documentation. The submitter's statement that this could

lead to overloaded conductors is vague and installation experience does not support his statement. In our mill, we have hundreds of roof top conduits and in the past 35 years we have not had a failure due to overheating or overloading. Our experience would suggest that a more thorough study is required before making such a drastic change to the code and that the existing provisions are adequate.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-37.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-37.
Comment onAffirmative:
ZIMNOCH: See my comment on affirmative on Commen 6-37.

6-46 Log #1088 NEC-P06 **Final Action: Accept in Principle**
(Table 310.16, Table 310.17, Table 310.18, and Table 310.19)

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute
Comment on Proposal No: 6-45
Recommendation: Reject the Proposal.
Substantiation: This proposal should have been rejected. The submitter's substantiation does not adequately distinguish conduits directly on the roof surface vs. supported some distance above the roof. The tests conducted were not thorough in that they were conducted in Las Vegas but not also in a northern climate. Test data shows a 30° F temperature differential during 3-4 afternoon hours but does not present evidence of degradation of conductor insulation. The submitter has supplied a detailed technical report; however, the test method is not an approved ANSI or NEMA test procedure for determining conductor derating due to direct sunlight on the raceway.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 6-37.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-37.
Comment onAffirmative:
ZIMNOCH: See my comment on affirmative on Commen 6-37.

6-47 Log #397 NEC-P06 **Final Action: Reject**
(Table 310.16, FPN (New))

Submitter: Mark Kucharski, R W Cooper & Associates
Comment on Proposal No: N/A
Recommendation: Add "FPN: See 110.14(C) for conductor temperature limitations due to termination provisions" to Table 310.16.
Add "FPN: See Table 310.15(B)(2)(a) for adjustment factors for more than three current carrying conductors in raceway or cable" to Table 310.16.
Substantiation: The temperature limitations associated with the ampacity of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor or device - NEC 110.14(C).
This article is commonly overlooked when evaluating circuit conductor size, which can result in overheating terminations and devices. Also often overlooked is the ampacity derivative required for more than three current carrying conductors. Recommended example: NEC 2002 Handbook page 104,105.
Panel Meeting Action: Reject
Panel Statement: The comment is rejected because it does not comply with the requirements of Section 4-4.5 of NFPA Regulations Governing Committee Projects. No proposal number was provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-48 Log #69 NEC-P06 **Final Action: Reject**
(Table 310.63)

Submitter: Michael V. Glenn, Longview Fibre Co.
Comment on Proposal No: 6-49
Recommendation: Reject this proposal.
Substantiation: I request the panel reconsider its action on this proposal and reject this proposal based on inadequate and nonspecific substantiation and on a proven safe installation and service record for these types of installations. The submitter does not state what voltage level was present or the specifics as to what caused the arcing. It could be poor workmanship, a code violation, non-listed cable, or many other things. Our cable manufacturer states that they have not had any problems with their listed cables in these applications. In our mill, we have used 5KV non-shielded cable for 2.4KV applications consisting of several hundred motor feeders and installations with no cable problems or cable failures over the past 35 years. Our record would indicate that this practice is safe and adequate. Any panel action should be specific to the factually substantiated problem rather than an all inclusive and restrictive requirement eliminating a proven safe installation procedure.
Panel Meeting Action: Reject
Panel Statement: The submitter can still use the 2400 volt nonshielded cable as described in his substantiation.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-18.
Comment on Affirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-49 Log #570 NEC-P06 **Final Action: Accept**
(Table 310.63)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-49
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the recommendation of the TCC to reconsider. Refer to the panel action on Comments 6-55 and 6-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-18.
Comment onAffirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-50 Log #523 NEC-P06 **Final Action: Reject**
(Table 310.63)

Submitter: David Soffrin, American Petroleum Institute
Comment on Proposal No: 6-49
Recommendation: The panel action should have been to reject Proposal 6-49.
Substantiation: The submitter failed to supply sufficient technical substantiation for the proposed change in Proposal 6-12; therefore, Table 310.63 should not be modified. Companies within the petroleum and chemical industry have over 20 years of successful history using unshielded 5kV Type MC cable on 2400V and 4160V distribution systems and utilization equipment. Proper routing and termination techniques are required for both shielded and unshielded cable in order to obtain a safe and reliable installation. The submitter failed to demonstrate why the absence of a shield at 4kV has resulted in widespread cable failures throught the industry. (See companion Comment on Proposal 6-12.)
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 6-18.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Reject this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: See my Explanation of Negative Vote on Comment 6-18.
Comment onAffirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-51 Log #734 NEC-P06 **Final Action: Reject**
(Table 310.63)

Submitter: Steven Kovacs, ConocoPhillips - Bayway Refinery
Comment on Proposal No: 6-49
Recommendation: The panel action should have been to reject Proposal 6-49
Substantiation: The submitter failed to supply sufficient technical substantiation for the proposed change. Unshielded 5kV cables have been used successfully in the petroleum industry since the late 40's. At this Refinery, we have

over 40 years of successful history using unshielded 5kV cables on 2400V and 4160V distribution systems and utilization equipment, without the type of problems the submitter states. The substantiation states that "Commercial specifiers, etc." This seems to indicate that this problem is in the commercial application, not in industrial applications. Proper installation techniques are required for both shielded and unshielded cables to obtain a safe and reliable installation. The submitter did not demonstrate that the absence of a shield at 5kV has resulted in widespread cable failures throughout the industry.

(See companion comment on Proposal 6-12)

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 6-18.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Reject this comment.

See my Explanation of Negative Vote on Comment 6-9.

LIGGETT: See my explanation of negative vote on Comment 6-37.

MCCLUNG: See my Explanation of Negative Vote on Comment 6-18.

Comment onAffirmative:

ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-52 Log #904 NEC-P06 **Final Action: Accept in Part**
(Table 310.63)

Submitter: H. R. Stewart, HRS Consulting

Comment on Proposal No: 6-49

Recommendation: Editorial comment - On multiconductor insulation there is an "*". This should be added as currently in the 2002 NEC Table.

Add exception as follows:

In industrial establishments where conditions of maintenance and supervision ensure that only qualified persons service the installation, nonshielded cables may be permitted up to 5000 volts provided the insulation and jacket thickness are for wet locations thickness and the cable is armored.

Substantiation: This would permit the use of nonshielded cable with additional insulation and a surface discharge resistant jacket to be used provided it is the heavy insulation and jacketed in an armored cable. This is similar to Mr. McClung's comment 1) with affirmative ballot with added restrictions.

Panel Meeting Action: Accept in Part

The panel accepts the addition of the "asterisk". Refer to the panel action on Comment 6-55.

The panel rejects the addition of the exception.

Panel Statement: It is the panel's decision that cables rated above 2400 volts be shielded. The submitter has provided no technical substantiation to add the exception. The submitter of the original proposal has provided substantiation to support the 2400 volt limitation.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Accept this comment.

See my Explanation of Negative Vote on Comment 6-9.

LIGGETT: See my explanation of negative vote on Comment 6-37.

MCCLUNG: The panel accepted in part the editorial part of this comment but reject the part recommending an exception for the use of 5000 volt cable in industrial establishments. The panel instead should have accepted this comment or have accepted this comment in principal and granted an exception to industrial establishments for allowing the use of 5000/8000 volt non-shielded cable where the conditions of maintenance and supervision ensure that only qualified persons service the installation as was proposed by Mr. McClung's affirmative comment on Proposal 6-49 and the recommendation of Mr. Stewart in this comment. This would have kept the 2001 to 5000 or 5001 to 8000 volt columns in Table 310-63 as they appear in the 2002 NEC.

See my Explanation of Negative Ballot on Comment 6-18, 2nd through 6th paragraphs for the remainder of explanation.

Comment on Affirmative:

ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-53 Log #921 NEC-P06 **Final Action: Reject**
(Table 310.63)

Submitter: Dorothy Kellogg, American Chemistry Council

Comment on Proposal No: 6-49

Recommendation: This proposal should be rejected.

Substantiation: Insufficient substantiation was provided to require this change. Although the change would correct the problems illustrated in the proposal documentation, different work practices in the installation would also fix the problem without limiting a widely used and accepted installation method. This change would create other installation problems in some cases. This proposal should be rejected until further study can be done to understand the implications of this change.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 6-18.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Reject this comment.

See my Explanation of Negative Vote on Comment 6-9.

LIGGETT: See my explanation of negative vote on Comment 6-37.

MCCLUNG: See my Explanation of Negative Vote on Comment 6-18.

Comment onAffirmative:

ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-54 Log #1089 NEC-P06 **Final Action: Reject**
(Table 310.63)

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute

Comment on Proposal No: 6-49

Recommendation: Reject the Proposal.

Substantiation: This proposal along with Proposal 6-12, should have been rejected. The submitter describes an isolated instance of a problem and has not provided adequate technical substantiation that the problem as described by the submitter is common throughout the industry. Many unshielded cables are installed and operating and the experience shows this is not a widespread problem.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 6-18.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Reject this comment.

See my Explanation of Negative Vote on Comment 6-9.

LIGGETT: See my explanation of negative vote on Comment 6-37.

MCCLUNG: See my Explanation of Negative Vote on Comment 6-18.

Comment onAffirmative:

ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-55 Log #2383 NEC-P06 **Final Action: Accept**
(Table 310.63)

Submitter: James M. Daly, General Cable

Comment on Proposal No: 6-49

Recommendation: The Proposal should have been Accepted in Principle in Part.

In the Table heading, change "Insulation" to "Insulated Conductors Rated 2400 Volts".

Delete the heading over columns 2 through 13 that reads "2001-5000 Volts".

Replace the footnote to the Table that reads "* Under a common overall covering such as a jacket, sheath, or armor."

Substantiation: The proposed changes will incorporate Mr. Zimnock's comments in principle and correlate with the Panel Action on Proposal 6-12.

The Table heading in the 2002 Code read "Insulated Conductors" rather than "Insulation".

The conductors will be rated 2400 V; there are no conductor ratings between 2001 and 2400 V.

The footnote was inadvertently deleted. It was not part of the Proposal to delete it.

Panel Meeting Action: Accept

Panel Statement: The panel recognizes that this modifies the action on Comment 6-56.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

KOMASSA: I am voting Negative on the panel action to Accept this comment.

See my Explanation of Negative Vote on Comment 6-9.

LIGGETT: See my explanation of negative vote on Comment 6-37.

MCCLUNG: The panel should have rejected the comment with the exception of the editorial comment on the asterisk. See my Explanation of Negative Ballot on Comment 6-48 for remainder of information.

Comment onAffirmative:

ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-56 Log #3230 NEC-P06 **Final Action: Accept**
(310.63)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 6-49
Recommendation: The Panel should continue to accept this proposal.
Substantiation: We agree with the submitter's substantiation and his assessment that field installation of non-shielded cable above 2,000 volts creates a hazardous condition based on field observation. It has been our experience that insulation breakdown occurs when non-sheilded cable is installed by unqualified personnel. They perform installations of non-shielded medium voltage cable with false sense of security and the belief that it terminates and has the same support and bending radius requirements of low voltage cable.
This comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards Committee.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
KOMASSA: I am voting Negative on the panel action to Accept this comment.
See my Explanation of Negative Vote on Comment 6-9.
LIGGETT: See my explanation of negative vote on Comment 6-37.
MCCLUNG: The panel should have rejected the comment. See my Explanation of Negative Ballot on Comment 6-18 for remainder of information.
Comment onAffirmative:
ZIMNOCH: See my explanation of affirmative vote on Comment 6-9.

6-57 Log #905 NEC-P06 **Final Action: Hold**
(Table 310.64)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 6-50
Recommendation: In second column over 2001-5000 volts, add "100 percent insulation".
Substantiation: This appears to have been left off. This corresponds with the revision Note 2 as made in Proposal 6-51. This makes it much clearer that 5KV shielded cables with 90 mils of insulation is a 100 percent insulation level.
Added note: I support the inclusion of the 173 percent insulation level in Table 310.64.
Panel Meeting Action: Hold
Panel Statement: The panel holds the comment for further study because it introduces material that has not had public review.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-58 Log #2132 NEC-P06 **Final Action: Reject**
(Table 310.64)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-50
Recommendation: Accept the proposal in principle. Revise the opening line to avoid the use of the word "following"; revise (4) and change the final note to (5), all to read as follows:
Cables in this category shall be permitted to be installed where (1) through (4) or where (5) apply:
(4) where the faulted section will be de-energized in an orderly shutdown that protects the integrity of the cable.
(5) as a component of and under the requirements governing 100 or 133 percent insulation level applications where additional insulation strength is desirable.
Substantiation: This wording avoids imprecise language including "adequate", conforms to the Style Manual preference to avoid prepositions in favor of citations to describe text locations, assures the cable integrity will not be compromised, and avoids the awkward final sentence beginning "also" by replacing it with a simpler presentation that fits in the list with parallel construction to the other items.
Panel Meeting Action: Reject
Panel Statement: The submitter's recommendation does not add clarity or further meaning to the list of items under the 173 percent insulation category. Proposed list item (5) cannot be used because it is not one of the conditions of use.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-59 Log #2133 NEC-P06 **Final Action: Hold**
(Table 310.64)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 6-51
Recommendation: Accept the proposal in principle. Reformat the note in a list format similar to that accepted under Proposal 6-50, as follows:
100 Percent Insulation Level. Cables in this category shall be permitted to be installed where (1) or (2) apply:
(1) on grounded systems, where relay protection is arranged to clear ground faults as rapidly as possible and in not less than 1 minute
(2) on ungrounded systems where the faulted section will be completely de-energized as rapidly as possible and in not less than one minute.
FPN: These cables are applicable to the great majority of installations on grounded systems.
133 Percent Insulation Level. Cables in this category shall be permitted to be installed where (1) and (2) or where (3) apply:
(1) where the fault clearing time requirements of the 100 percent level cannot be met
(2) where the faulted section will be de-energized in an orderly shutdown that protects the integrity of the cable.
(3) As a component of and under the requirements governing 100 percent insulation level applications where additional insulation strength is desirable.
FPN: This insulation level corresponds to that formerly designated for ungrounded systems.
Substantiation: This wording uses parallel language to that accepted for the 173 percent category, allowing a consistent presentation. It avoids imprecise language and transfers explanatory information to fine print notes where it belongs.
Panel Meeting Action: Hold
Panel Statement: The panel holds the comment for further study because it introduces material that has not had public review and would require the panel to restudy the text of the ROP.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-60 Log #3229 NEC-P06 **Final Action: Reject**
(Table 310.64)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 6-50
Recommendation: The Panel should reject this proposal.
Substantiation: We agree with the comments expressed in Mr. Laidler's negative vote. There does not appear to be any technical substantiation to warrant the 173 percent permission other than its used in industry. Not all "existing" practices are safe yet that often seems to be the basis under which expansive provisions enter the Code. Mr. Laidler's concerns warrant answers with regards to the prevalence of the present misuse of the Code and the reasons it is necessary.
This comment represents the official position of the International Brotherhood of Electrical Workers Codes & Standards Committee.
Panel Meeting Action: Reject
Panel Statement: The change is needed to allow an orderly shutdown in continuous process industries as noted in the substantiation of Proposal 6-50. This will also allow compliance with OSHA 1910.119 where shutdown of hazardous processes may require more time than is currently permitted.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
LAIDLER: I am voting to "Reject" this comment. During the panel discussion it was clearly indicated that safety could sometimes be better served with this new note to Table 310.64, by allowing more time for an orderly shutdown.

ARTICLE 312 — CABINETS, CUTOUT BOXES, AND METER SOCKET ENCLOSURES

9-5 Log #391 NEC-P09 **Final Action: Accept in Principle in Part**
(312.2(A))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 9-5
Recommendation: Revise panel action:
For connections to enclosures raceways or cables entering ~~above live parts~~ at other than the bottom of the enclosure shall use fittings listed for wet locations.
Substantiation: The proposed revision is simpler and more encompassing. Live parts is defined as energized conductive components which includes conductors. 312.11(A)(3) suggests live parts are exposed current-carrying parts. Exposed (as applying to live parts) is defined as not suitably guarded, isolated, or insulated. Suitable enclosures or insulation would imply there are no live parts per 312.11. This Comment is intended to simplify the requirement and avoid confusion.

Panel Meeting Action: Accept in Principle in Part

Accept in principle that the new requirement must address the fact that insulated conductors are live parts within the Article 100 definition.

The panel rejects the addition of fittings listed for wet locations for all entries below the level of live parts on the side of the enclosure.

Insert the words "the level of uninsulated" before "live parts" in the panel action on Proposal 9-5.

The wording of the last sentence in 312.2(A) shall read as follows: "For enclosures in wet locations, raceways or cables entering above the level of uninsulated live parts shall use fittings listed for wet locations."

Panel Statement: CMP 9 agrees that live parts include insulated conductors not intended to be included. CMP 9 prefers to continue to restrict the application of the requirement to instances where water could be entrained into such components.

The requirements are the same as found in the product standards, which have shown no issues with the entry of raceways or cables into the side of an enclosure below uninsulated live parts.

No substantiation was provided in the comment justifying a problem with water entry to require these fittings on the side of the enclosure.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-6 Log #884 NEC-P09 **Final Action: Reject**
(312.5(A) (New))

Submitter: Wayne H. Robinson, Prince George County Government

Comment on Proposal No: 9-6

Recommendation: New text:

(A) "Openings to be closed". Openings through which conductors enter shall be adequately closed by a listed fitting or connector.

Substantiation: Reviewing Mr. Hartwell's comments leaves one to believe the use of listed fittings and connectors meeting UL 486(A) standards and UL 467 Grounding standards can be ignored when applying the NEC. We in code enforcement need NEC requirements and UL standards applied to standardize installations and provide quality of workmanship 110.12. 250.64(B) only provides requirements other than adequately secured for grounding electrode conductors. Where are the support requirements? The use of listed fittings will resolve this issue and help with compliance of 110.3(A)(1) and provide necessary strain relief at the enclosure. The majority of AHJs require listed fitting or one which can be field tested or tagged. Sharp edges of enclosures can be detrimental to bare copper conductors. In addition, to maintain continuity at the enclosure and not cause the possibility of choke effect on GEC during severe faults, loss of grounded conductors or lightning strikes.

Panel Meeting Action: Reject

Panel Statement: CMP 9 reaffirms the action on Proposal 9-6. Grounding electrode conductors supported in accordance with 250.64(B) will not require strain relief at the enclosure, nor will they be abraded by the enclosure opening. The conductors will be bonded to the enclosure by other rules, eliminating magnetic choke effects.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-7 Log #2020 NEC-P09 **Final Action: Accept**
(312.21)

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

Comment on Proposal No: 9-14

Recommendation: Accept the panel action in principle. Add the words "employing a flush-type cover" at the end of the sentence.

Substantiation: This comment allows the new section to retain functional parity with 314.21. Snap switches, receptacles, etc. are rarely sold with the box; the enclosure is completed in the field using a faceplate. Although that is indeed comparable to a flush panelboard enclosure with the trim perched on the wall surface, such a requirement would be excessive in the case of a panelboard with a surface mounted cover that telescopes over the base. Many surface mounting panels are installed recessed to a greater or lesser degree.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

ARTICLE 314 — OUTLET, DEVICE, PULL, AND JUNCTION BOXES; CONDUIT BODIES; FITTINGS; AND MANHOLES

9-8 Log #679 NEC-P09 **Final Action: Accept**
(314 (New))

Note: The Technical Correlating Committee advises that Article title and scope are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee Accepts the Panel Action.

Submitter: Ron Morgan, Florida Electric Contracting Service Inc.

Comment on Proposal No: 9-15

Recommendation: Modify article title to include handhole enclosure.

Substantiation: This correlates with 1-109 Log #1403, 3-78 Log #1407; and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.

Panel Meeting Action: Accept

Panel Statement: CMP 9 notes that action on Proposal 9-15 modified the title of Article 314. The correct title is shown in the preprint on page 70-145. The correct title is Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Handhole Enclosures.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-9 Log #686 NEC-P09 **Final Action: Accept**
(314 (New))

Submitter: Kevin J. Nuss, Florida Electric Contracting Service Inc.

Comment on Proposal No: 9-15

Recommendation: Modify article title to include handhole enclosure.

Substantiation: This correlates with 1-109 Log #1403; 3-78 Log #1407; and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 9-8.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-10 Log #693 NEC-P09 **Final Action: Accept**
(314 (New))

Submitter: Donald J. Hicks, Florida Electric Contracting Service Inc.

Comment on Proposal No: 9-15

Recommendation: Modify article title to include handhole enclosure.

Substantiation: This correlates with 1-109, Log #1403; 3-78, Log #1407; and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 9-8.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-11 Log #874 NEC-P09 **Final Action: Accept**
(314)

Submitter: Steven Siems, Florida Electric Service Co. Inc. / Rep. Neca South Florida

Comment on Proposal No: 9-15

Recommendation: Modify Article Title to include handhole enclosure.

Substantiation: This correlates with 1-109, Log #1403; 3-78, Log #1407; and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 9-8.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-12 Log #881 NEC-P09 **Final Action: Accept**
(314)

Submitter: Harold K. Siems, Florida Electric Service Co. Inc.

Comment on Proposal No: 9-15

Recommendation: Modify Article title to include handhole enclosure.

Substantiation: This correlates with 1-109 Log #1403; 3-78 Log #1407 and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 9-8.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-13 Log #2851 NEC-P09 **Final Action: Accept**
(314)

Submitter: Jose Gonzalez, Miami Dade Bldg. Department

Comment on Proposal No: 9-15

Recommendation: Modify Article title to include handhole enclosure.

Substantiation: This correlates with 1-109 Log #1403; 3-78 Log #1407; and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.

Panel Meeting Action: Accept

Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-14 Log #3079 NEC-P09 **Final Action: Accept**
(314)

Submitter: Steven Gilbert, Miami Dade Building Department
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include "handhole enclosure."
Substantiation: This correlates with 1-109 Log 1403, 3-78 Log 1407, and 16-86 Log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-15 Log #3085 NEC-P09 **Final Action: Accept**
(314)

Submitter: Billy Jackson, Miami Dade County Building Department
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include "handhole enclosure."
Substantiation: This correlates with 1-109 Log 1403, 3-78 Log 1407, and 16-86 Log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-16 Log #3459 NEC-P09 **Final Action: Accept**
(314)

Submitter: Arnold M. Velazquez, Arnold & Associates Inc.
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include handhole enclosures.
Substantiation: This correlates with 1-109 Log #1403, 3-78 Log #1407, and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-17 Log #462 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Kenneth L. Groves, Edwards Electric Corp.
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include handhole enclosure.
Substantiation: This correlates with Proposal 1-109, Log 1403, Proposal 3-78, Log 1407, and Proposal 15-86, Log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-18 Log #471 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: James G. DiLullo, Dynaelectric Company, Florida
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include handhole enclosure.
Substantiation: This correlates with Proposal 1-109, Log 1403, Proposal 3-78, Log 1407, and Proposal 16-86, Log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-19 Log #506 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Vernon Jay Franke, Jr., Construction Consultants of Florida Inc.
Comment on Proposal No: 9-15
Recommendation: Modify the Article Title to include Handhole Enclosure.
Substantiation: This correlates with Proposal 1-109 (Log 1403), Proposal 3-78 (Log 1407), and Proposal 16-86 (Log 1408) to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-20 Log #713 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Joseph DeRosa, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-15
Recommendation: Modify article Title to include handhole enclosure.
Substantiation: This correlates with proposal 1-109, log 1403, proposal 3-78, log 1407, and proposal 16-86, log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-21 Log #724 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Pascal McFadden, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-15
Recommendation: Modify the Article Title to include handhole enclosure.
Substantiation: This correlates with proposal 1-109, log 1403, proposal 3-78, log 1407, and proposal 16-86, log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-22 Log #1290 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Paul Yesbeck, Acolite Claude United Sign Co.
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include handhole enclosure.
Substantiation: This correlates with 1-109, Log 1403; 3-78, Log 1407 and 16-86, Log 1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-23 Log #1342 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Victor Lombardi, Miami-Dade County Building Department
Comment on Proposal No: 9-15
Recommendation: Modify Article Title to include handhole enclosure.
Substantiation: This correlates with 1-109 Log #1403, 3-78 Log #1407, and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-24 Log #3630 NEC-P09 **Final Action: Accept**
(314 Title)

Submitter: Stephen Kovach, Dade County Building & Zoning Dept.
Comment on Proposal No: 9-15
Recommendation: Modify Article title to include "handhole enclosure".
Substantiation: This correlates with 1-109 Log #1403; 3-78 Log #1407; and 16-86 Log #1408 to include the use of handhole enclosures and further define that equipment and installation techniques.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-8.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-25 Log #678 NEC-P09 **Final Action: Accept**
(314.1 (New))

Note: The Technical Correlating Committee advises that Article title and scope are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee Accepts the Panel Action.
Submitter: Ron Morgan, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109 Log #1403; and 3-78 Log #1407 NEC P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP 3 and CMP 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: The panel assumes the comment is a recommendation to continue to accept the panel action on Proposal 9-18.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-26 Log #685 NEC-P09 **Final Action: Accept**
(314.1 (New))

Submitter: Kevin J. Nuss, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109 Log #1403 and 3-78 Log #1407 NEC P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP 3 and CMP 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-27 Log #692 NEC-P09 **Final Action: Accept**
(314.1 (New))

Submitter: Donald J. Hicks, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109 Log #1403 and 3-78 Log #1407 NEC P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP 3 and CMP 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-28 Log #712 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Joseph DeRosa, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with proposal 1-109, log 1403 and proposal 3-78, log 1407, NEC Code-Making Panel 3, to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by Code-Making Panel 3 and Code-Making Panel 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-29 Log #873 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Steven Siems, Florida Electric Service Co. Inc. / Rep. Neca South Florida
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109 Log #1403 and 3-78 Log #1407 NEC P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP 3 and CMP 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-30 Log #880 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Harold K. Siems, Florida Electric Service Co. Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109 Log #1403; and 3-78 Log #1407 NEC P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP 3 and CMP 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-31 Log #1289 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Paul Yesbeck, Acolite Claude United Sign Co.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109, Log 1403 and 3-78, Log 1407 NEC P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP-3 and CMP-9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-32 Log #3460 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Arnold M. Velazquez, Arnold & Associates Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with 1-109, Log #1403 and 3-78 Log #1407 NEC-P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP-3 and CMP-9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-33 Log #463 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Kenneth L. Groves, Edwards Electric Corp.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with Proposal 1-109, Log 1403 and Proposal 3-78, Log 1407, NEC Code-Making Panel 3, to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by Code-Making Panel 3 and Code-Making Panel 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-34 Log #475 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: James G. DiLullo, Dynaelectric Company, Florida
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with Proposal 1-109, Log 1403 and Proposal 3-78, Log 1407, NEC Panel 3, to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by Code-Making Panel 3 and Code-Making Panel 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-35 Log #505 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Vernon Jay Franke, Jr., Construction Consultants of Florida Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handole enclosures" to the existing text.
Substantiation: This correlates with Proposal 1-109 (Log 1403) and Proposal 3-78 (Log 1407) for Code-Making Panel 3 to establish a definition of a hand-hole enclosure and to describe installation techniques. This is a cooperative effort by Code-Making Panels 3 and 9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-36 Log #725 NEC-P09 **Final Action: Accept**
(314.1)

Submitter: Pascal McFadden, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures" to existing text.
Substantiation: This correlates with proposal 1-109, log 1403 and proposal 3-78, log 1407, Code-Making Panel 3, to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by Code-Making Panel 3 and Code-Making Panel 9 to allow handhole enclo-sures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-37 Log #1343 NEC-P09
(314.1)

Submitter: Victor Lombardi, Miami-Dade County Building Department
Comment on Proposal No: 9-18
Recommendation: Add "handhole enclosures'" to existing text.
Substantiation: This correlates with 1-109 Log #1403 and 3-78 Log #1407 NEC-P03 to establish a definition of a handhole enclosure and to describe installation techniques. This is a cooperative effort by CMP-3 and CMP-9 to allow handhole enclosures.
Panel Meeting Action: Accept
Panel Statement: See panel action and statement on Comment 9-25.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-38 Log #1027 NEC-P09 **Final Action: Accept in Principle**
(314.4)

Note: The Technical Correlating Committee directs that Proposal 9-21 and Comment 9-38 be reported as "Hold". The Technical Correlating Committee has concerns that the reference to the 250.112(i) requirement may not adequately address all of the relevant Article 250 grounding issues.
Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 9-21
Recommendation: This proposal should have been rejected or accepted in principal by deleting the entire section.
Substantiation: Article 250 does not require all metal boxes to be grounded. In particular, metal boxes used for Class 2, Class 3, Power-limited fire alarm, and boxes used for communications are usually not required to be grounded (See 250.112(I)). This proposal would override those rules and require ground-ing even where there is no shock hazard and there is no grounding means available in the wiring method. Since the apparent intent of the proposal is to comply with the NEC Style Manual, the entire section should be deleted as nothing is added by this section that is not covered by Article 250. Otherwise, the specific applicable sections would have to be listed and this would be unnecessarily cumbersome.
Panel Meeting Action: Accept in Principle
Modify the sentence to read: All metal boxes shall be grounded except where system grounding is not required as described in 250.112(I).
Panel Statement: The reference to 250.112(I) satisfies the submitter's concern and confines ungrounded boxes to the specific power- limited applications. The grounding requirement must be maintained in Article 314 because con-cealed boxes could otherwise qualify for exemption from equipment grounding due to limitations in 250.110 and 250.112.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-39 Log #879 NEC-P09 **Final Action: Reject**
(314.15)

Submitter: Harold K. Siems, Florida Electric Service Co. Inc.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring technques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-40 Log #2856 NEC-P09 **Final Action: Reject**
(314.15)

Submitter: Jose Gonzalez, Miami Dade Bldg. Department
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-41 Log #3084 NEC-P09 **Final Action: Reject**
(314.15)

Submitter: Steven Gilbert, Miami Dade Building Department
Comment on Proposal No: 9-23
Recommendation: I agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-42 Log #26 NEC-P09 **Final Action: Accept in Principle in Part**
(314.15 Exception (New))

Note: The Technical Correlating Committee understands that the panel action does not make any text modifications to 314.15.
Submitter: Alfonso Fernandez-Fraga, Initial Engineers, P.A.
Comment on Proposal No: 9-23
Recommendation: Add new exception to read:
Exception: Approved handhole enclosure provided with conductors, splices, tapes and terminations listed for the environment in which they are installed need not be designed to prevent the entrance or accumulation of moisture.
Substantiation: Delete the word "approved" and add a definition for "hand-hole enclosure". As long as the word "approved" remains, the enclosure is subject to unspecific scrutiny by the Authority Having Jurisdiction. Thousands of installations exist with open-bottom boxes and submersive (listed) con-nectors and fuse holders. We need language that makes such an installation unequivocally acceptable.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Accept in Principle in Part
The panel accepts the information about conductors, splices, and terminations and rejects the creation of the exception to 314.15.
Panel Statement: See panel action and statement on Comments 9-56 and 9-111.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-43 Log #603 NEC-P09
314.15 Exception (New)) **Final Action: Accept**

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-23
Recommendation: The Technical Correlating Committee directs that the Panel clarify the Panel Action on this Proposal and identify the exact text of the exception. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The material has been relocated to 314.30. Refer to the action on Comment 9-111 for the final text.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-44 Log #464 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Kenneth L. Groves, Edwards Electric Corp.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-45 Log #473 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: James G. DiLullo, Dynaelectric Company, Florida
Comment on Proposal No: 9-23
Recommendation: I agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-46 Log #504 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Vernon Jay Franke, Jr., Construction Consultants of Florida Inc.
Comment on Proposal No: 9-23
Recommendation: I agree with the proposed Exception.
Substantiation: This Exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-47 Log #677 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Ron Morgan, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-48 Log #684 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Kevin J. Nuss, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-49 Log #691 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Donald J. Hicks, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-50 Log #711 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Joseph DeRosa, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-23
Recommendation: I agree with the proposed Exception.
Substantiation: This Exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-51 Log #726 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Pascal McFadden, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-23
Recommendation: I agree with the proposed Exception.
Substantiation: This Exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-52 Log #872 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Steven Siems, Florida Electric Service Co. Inc. / Rep. Neca South Florida
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-53 Log #1288 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Paul Yesbeck, Acolite Claude United Sign Co.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-54 Log #1330 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Herbert P. Spiegel, Corona Industrial Electric
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-55 Log #1344 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Victor Lombardi, Miami-Dade County Building Department
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-56 Log #2021 NEC-P09
(314.15 Exception (New))

Note: The Technical Correlating Committee directs that this Comment be reported as "Reject" since none of the changes were accepted. The proposed Exception was deleted.
Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-23
Recommendation: Accept the panel action in principle. Add an additional sentence to the exception as follows:
"The conductors and any splices or terminations if present shall be listed as suitable for direct burial."
Substantiation: The panel action on this proposal presumed this information was being addressed in 300.15. That turns out not to be the case. This is a logical location to include this material, since the requirement follows directly from the lack of a bottom to the enclosure, as recognized in this exception. This comment uses the term "listed" because that is the requirement in 110.14(B).
Panel Meeting Action: Accept in Principle
Delete the exception to 314.15 that was created in Proposal 9-23.
Panel Statement: The exception as created in Proposal 9-23 does not deal with the main body of the text in 314.15 (A), which deals with boxes, conduit bodies, and fittings. The provisions for handholes in the exception is relocated to 314.30. See Comment 9-111.
The new location for this rule avoids the problem and centralizes in one place all rules for handhole enclosures. The previously accepted language providing an exception to the rule for the prevention of moisture accumulation is not an issue in the new location and does not need to be repeated.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-57 Log #3090 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Billy Jackson, Miami Dade County Building Department
Comment on Proposal No: 9-23
Recommendation: I agree with the proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-58 Log #3461 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Arnold M. Velazquez, Arnold & Associates Inc.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-59 Log #3634 NEC-P09 **Final Action: Reject**
(314.15 Exception (New))

Submitter: Stephen Kovach, Dade County Building & Zoning Dept.
Comment on Proposal No: 9-23
Recommendation: Agree with proposed exception.
Substantiation: This exception recognizes the established use of bottomless enclosures as long as the wiring techniques inside are listed or approved for the environment.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-56.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-60 Log #3895 NEC-P09 **Final Action: Accept in Principle**
(314.15(C))

Submitter: Tom Baker, Puget Sound Electrical Training
Comment on Proposal No: 9-32
Recommendation: Add new section (C):
(C) Open Bottom Handhole Wiring
(1) Single conductors, cables, taps or splices installed in an open bottom junction box or handhole must be suitable for direct burial. However, an open bottom box manufactured specifically for electrical use will be permitted to be used as an electrical junction box to enclose single conductors, cables, taps, or splices rated for wet locations, only under the following conditions:
(a) In vehicular traffic areas the box must be rated for not less than H-20 loading and be provided with a bolted, hinged, or slide-on lid embossed with the identification "ELECTRIC" or "ELECTRICAL".
(b) In incidental vehicular traffic areas (e.g., parks, sports fields, sidewalks, grass lawns, etc.) the box must be rated for not less than H-10 loading and be provided with a bolted, hinged, or slide-on lid embossed with the identification "ELECTRIC" or "ELECTRICAL."
(c) In nonvehicular traffic areas (e.g., flower beds, patio decks, etc.) the box must be designed for the purpose and be provided with a lid embossed with the identification '"ELECTRIC" or 'ELECTRICAL."
(d) All conductors must be installed in approved electrical raceways that enter vertically from the open bottom of the enclosure. These raceways must be fitted with a bushing terminal fitting, or seal incorporating the physical protection characteristics of a bushing and project not less than 5 cm (2 in.) above the bottom surface material. The bottom surface material must be pea gravel or sand a minimum of cm (2 in.) thick or more if required by the box manufacturer.
Substantiation: Open bottom handholes are commonly used for traffic signal/roadway lighting pull and junction boxes. Currently the NEC does not recognize this wiring method, but it can be a safe wiring method if installed properly, and if the metal frame-lid (if metal) are bonded to an equipment grounding conductor. Washington State allows this common wiring method in its Washington Administrative Code 296-46B-314, listed above. For traffic signal and roadway wiring, an open bottom handhole provides a system that protects the junction box from vehicle damage. As Proposal 9-18 has been accepted by the TCC to include handholes in the title and scope of Article 314, this comment provides a suggested method for installation. The Washington State WAC takes into consideration:
- Use of wet location cables
- Traffic loading to prevent damage from vehicles
- Identification of the handhole
- Entrance of raceways into the handhole
- Bottom surface material

An additional consideration would be the minimum distance from the handhole lid to the raceway ends to prevent damage to the conductors from the lid. Most of the open bottom handholes are concrete with metal frames and lids.
Panel Meeting Action: Accept in Principle
Panel Statement: CMP 9 notes that this comment applies to Proposal 9-23 rather than Proposal 9-32.
See panel action and statement on Comment 9-56, 9-111, 9-112 which meets the intent of the submitter.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-61 Log #524 NEC-P09 **Final Action: Reject**
(314.16(B))

Submitter: H. Lester Browne, H. Lester Browne Electrical Consulting & Educational Services
Comment on Proposal No: 9-34
Recommendation: Add text to read as follows:
314.16 Number of Conductors in Outlet, Device, and Junction boxes, and Conduit Bodies.
Boxes and conduit bodies shall be of sufficient size to provide free space for all enclosed conductors. In no case shall the volume of the box, as calculated in 314.16(A), be less than the fill calculation as calculated in 314.16(B). The minimum volume for conduit bodies shall be as calculated in 314.16(C).
The provisions of this section shall not apply to terminal housings supplied with motors.
FPN: For volume requirements of motor terminal housings, see 430.12.
Boxes and conduit bodies enclosing conductors 4 AWG or larger shall also comply with the provisions of 314.28.
(B) Box Fill Calculations. The volumes in paragraphs 314.16(B)(1) through (5), as applicable, shall be added together. No allowance shall be required for small fittings such as locknuts and bushings.
(1) Conductor Fill. Each conductor that originates outside the box and terminates or is spliced within the box shall be counted once, and each conductor that passes through the box without splice or termination shall be counted once.

The conductor fill shall be computed using Table 314.16(B). A conductor, no part of which leaves the box, shall not be counted.

Exception: An equipment grounding conductor or conductors or not over four ~~luminaire~~ (fixture~~)~~ wires smaller than 14 AWG, or both, shall be permitted to be omitted from the calculations where they enter a box from a domed ~~luminaire~~ (fixture~~)~~ or similar canopy and terminate within that box.

(2) Clamp Fill. Where one or more internal cable clamps, whether factory or field supplied , are present in the box, a single volume allowance in accordance with Table 314.16(B) shall be made based on the largest conductor present in the box. No allowance shall be required for a cable connector with its clamping mechanism outside the box.

(3) Support Fittings Fill. Where one or more ~~luminaire~~ (fixture~~)~~ studs or hickeys are present in the box, a single volume allowance in accordance with Table 314.16(B) shall be made for each type of fitting based on the largest conductor present in the box.

(4) Device or Equipment Fill. For each yoke or strap containing one or more devices or equipment, a double volume allowance in accordance with Table 314.16(B) shall be made for each yoke or strap based on the largest conductor connected to a device(s) or equipment supported by that yoke or strap. For devices or equipment supported or not supported by a strap or yoke and greater than 130 CM^3 (8 $in.^2$) a reduction 100% of the device's or equipment's total displacement shall be taken from the boxes volume. The total volume of the device shall not exceed 35% of the boxes interior volume.

Substantiation: The requirements in 314.16 have not addressed the problem or devices and equipment larger than the standard switch or duplex outlet. Often the box fill is greatly exceeded because of the volume presented by the device or equipment. Crowding of conductors in boxes presents a heating problem which, in time, causes deterioration of the insulation. The crowding also causes damage to the conductors because of pinching and severe bending. This has been creating ground faults and equipment failure. These are not always evident at check-out but after time, often when most needed, such as alarms, the failure occurs or is manifested. When the device or equipment is part of a life safety system failure may result in additional loss of life.

The integrity of a system depends on proper installation. This is not accomplished when the device or equipment is installed in a box which does not provide enough room for the device or equipment and the conductors. It has been my experience that electrical inspectors seldom check for this. They see the rough-in with no idea of the size of the device or equipment intended to be installed in a box. At the final inspection they see a device or piece of equipment installed without knowing the details or condition of the conductors in the box behind the device or equipment.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 9-62.

Furthermore, the panel rejects the change within Comment 9-61 from "luminaire" to "fixture". "Luminaire" is the accepted terminology.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-62 Log #1382 NEC-P09 **Final Action: Reject**
(314.16(B))

Submitter: John McCamish, IBEW #48

Comment on Proposal No: 9-34

Recommendation: Accept original proposal as submitted.

Substantiation: The panel states that devices shown do not have a yoke or strap and, therefore, rejected the proposal, which is incorrect. The definition of a yoke is simply a clamp or connection that unite or join something. The panel also states that the manufacturer should recommend box sizes. In fact, they do, and these recommendations are incorrectly based upon the current requirements of 314.16(B). These box sizes are based upon the associated conductor attached to the equipment without regard for the actual physical size of the equipment. In this manner, very small conductors result in very small boxes without adequate space for the equipment. The NEC is responsible for establishing minimum requirements, yet Panel 9 is avoiding a serious safety concern. Mr. Hartwell states that "of sufficient size" in parent language of 314.16 can always be used to address "the problem", therefore acknowledging the problem exists. He further states that equipment occupying two device spaces should be counted twice, thereby agreeing with the intent of the proposal. If the parent language alone is sufficient, then why have the requirements of 314.16(B)(1) through (5)?

Panel Meeting Action: Reject

Panel Statement: CMP 9 recognizes problems as addressed by several comments on 314.16(B)(4) with regard to equipment installed within a box. Sizes of devices such as receptacles and switches are clearly governed by the product standards. However, special systems equipment, intended to be mounted within boxes such as fire alarm apparatus, nurse call systems, and telecommunications components larger than conventional devices requires additional consideration.

Manufacturers of this type of equipment should recommend a box size that complies with the requirements in 314.16, that the boxes "provide free space for all enclosed conductors" in their equipment installation instructions.

CMP 9 has created a task group to review and expand 314.24 in the 2008 cycle to address these issues.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-63 Log #3298 NEC-P09 **Final Action: Reject**
(314.16(B))

Submitter: Jim Bosshart, Aurora Electric

Comment on Proposal No: 9-34

Recommendation: Accept original proposal as submitted.

Substantiation: The code section should be amended as recommended and submitted as to follow the intent and main backbone of the entire NEC. The intent of every section of the NEC is to provide for

a) Adequate free air space around equipment and wiring;

b) Separation of conductors and their enclosures for heat and wire bending space;

c) access for safe installation, maintenance and removal procedures.

The NEC has always kept the minimums to safe and adequate levels. Today's manufacturers and wiring installations dictate we install devices in boxes that are located in the branch circuit layouts, to incorporate relays, dimmers, remote signaling devices, lights, etc. The NEC, not the manufactures, is burdened with the responsibility to ensure compliance with the intent of the NEC. As larger products become smaller, or new products are inserted into field branch circuitry boxes the NEC must not allow contractors, electricians, manufacturers or loopholes in the code to determine what is "sufficient". They all will have very different criteria and motives than NEC to determine sufficiency in this code section. This amendment will allow the code to keep pace with the times, give positive standards to manufacturers and installers and not sacrifice the backbone of the NEC.

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 9-62.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

9-64 Log #147 NEC-P09 **Final Action: Accept in Principle**
(314.16(B)(1))

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

Comment on Proposal No: 9-27

Recommendation: Modify to:

"Each unbroken conductor 300 mm (12 in.) or shorter shall be counted once; each unbroken conductor length greater than 300 mm (12 in.) shall be counted one additional time for each additional full 150 mm (6 in.).

Substantiation: This eliminates the unnecessary term "loop," and conservatively requires installers to make allowance only for extra-extra-long unbroken conductors, but makes the allowances proportional to their excess length. No reason was put forth for treating them differently depending on whether they originate in or terminate in the enclosure or not.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action on Comment 9-65, which meets the intent of the submitter. The panel believes that counting every 6-inch segment of conductor is excessive.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

CROUSHORE: Code-Making Panel 9 unanimously rejected original Proposal 9-77. Acceptance of this comment reverses prior panel action without any technical substantiation in support of the change. The Code does not permit an installer to leave additional wire in the box and does permit the installer to use a box larger than minimally required by the box fill calculations in 314.16. However, the box volume calculations represent the minimum amount of space required for the existing conductors, devices, clamps, support studs, etc. that are in the box. The code cannot adequately anticipate any future wiring additions contemplated by the owner or installer with respect to additional box space required by those additions. On the original wiring installation, the installer may choose to use a box larger than originally required as a design consideration for future additions to the wiring system. In any case, the first sentence of 314.16 (Boxes and conduit bodies shall be of sufficient size to provide free space for all enclosed conductors) provides clarification on the installation of the extra length of conductor within the box.

9-65 Log #2022 NEC-P09 **Final Action: Accept**
(314.16(B)(1))

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

Comment on Proposal No: 9-27

Recommendation: The proposal should be accepted in principle. Add the following sentence after the present first sentence: "A looped, unbroken conductor not less than twice the minimum length required for free conductors in 300.14 shall be counted twice."

Substantiation: This revision properly distinguishes between a small loop left to assist wire pulling and dressing, and a large loop left to allow cutting in the middle and then adding a splice or a device. For such cases, the original proposal substantiation was correct. In my comment on vote I indicated a desire to use a generic 12-in. length specification, however, I am persuaded that the need (per 300.14) for additional length to make a future connection occurs often enough that we should use the full 300.14 provisions in this action.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
CROUSHORE: See my Explanation of Negative Vote on Comment 9-64.

9-66 Log #3395 NEC-P09 **Final Action: Reject**
(314.16(B)(1))

Submitter: Michael L. Last Na'alehu, HI
Comment on Proposal No: 9-29
Recommendation: Request reconsideration to add text as per proposal. This request is based upon the statement of Problem and Substantiaiton for Comment indicated below:
Substantiation: Insulation displacement connectors are so designed that in order to physically make a splice, no additional conductor length is required. The method of attachment is such that no supplementary conductor(s) is (are) utilized or required. While an insulation displacement connector will occupy space in a box, it could be less then that required by other splicing means. Also, as stated in 314.16(B)(1), "a conductor, no part of which leaves the box, shall not be counted." And such conductor would occupy more space than insulation displacement connector.
Panel Meeting Action: Reject
Panel Statement: The devices that this panel is familiar with require that the conductors be extended from the back of the box so the contact can be "set". This requires an additional length of conductor plus the volume taken by the device.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-67 Log #3396 NEC-P09 **Final Action: Reject**
(314.16(B)(1) Exception)

Submitter: Michael L. Last Na'alehu, HI
Comment on Proposal No: 9-30
Recommendation: Request reconsideration to add text as per proposal. This request is based upon the statement of Problem and Substantiaiton for Comment indicated below:
Substantiation: Insulation displacement connectors are so designed that in order to physically make a splice, no additional conductor length is required. The method of attachment is such that no supplementary conductor(s) is (are) utilized or required. While an insulation displacement connector will occupy space in a box, it could be less then that required by other splicing means. Also, as stated in 314.16(B)(1), "a conductor, no part of which leaves the box, shall not be counted." And such conductor would occupy more space than insulation displacement connector.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-66.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-68 Log #3397 NEC-P09 **Final Action: Reject**
(314.16(B)(2))

Submitter: Michael L. Last Na'alehu, HI
Comment on Proposal No: 9-32
Recommendation: Request reconsideration to add text as per proposal. this request is based upon the statement of Problem and Substantiaiton for Comment indicated below:
Substantiation: Insulation displacement connectors are so designed that in order to physically make a splice, no additional conductor length is required. The method of attachment is such that no supplementary conductor(s) is (are) utilized or required. While an insulation displacement connector will occupy space in a box, it could be less then that required by other splicing means. Also, as stated in 314.15(B)(1), "a conductor, no part of which leaves the box, shall not be counted." And such conductor would occupy more space than insulation displacement connector.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-66.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-69 Log #3398 NEC-P09 **Final Action: Reject**
(314.16(B)(2))

Submitter: Michael L. Last Na'alehu, HI
Comment on Proposal No: 9-33
Recommendation: This Log #2066 was a proposal but it was not acted on due to the erroneous assumption that it was a duplicate of Proposal 9-32 (Log 2065)-Request consideration.
Substantiation: None.
Panel Meeting Action: Reject
Panel Statement: CMP 9 did give further consideration to the Proposal Log #2066, which dealt with insulation displacement connectors as follows: "(2) Insulation Displacement Connectors. The use of insulation displacement connectors on a conductor shall be considered a splice of the conductor. Each conductor that passes through the box and has an insulation displacement connector attached shall be counted twice."
The panel agrees that the conductor bearing the insulation displacement device should be counted twice, but rejects the concept of calling out insulation displacement connectors as being different from other types of splicing devices.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-70 Log #146 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 9-34
Recommendation: Revise text to read as follows:
"For each yoke or strap occupying the spaces allotted for the straps of two or more standard devices, the box fill allowance calculated in accordance with Table 314.16(B) shall be multiplied by the number of spaces occupied."
Substantiation: The submitter's problem is real, and manufacturers do not normally indicate the size of box to be used nor could they, not knowing how many conductors it will contain. I do not fully follow his substantiation, nor are his images part of the ROP, but I have seen range receptacles that needed a much larger box than the table suggests. Depth is another issue, but until manufacturers add specifications so that it becomes a 110.3(B) issue, the proposed change will at least help.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
HARTWELL: This comment addresses a question that the proposal does not, but that should be the subject of further panel consideration in the 2008 cycle, namely, how to count device allowances for multigang devices, such as range, dryer, and welder receptacles. I believe a double allowance should be taken for such devices for each gang occupied by the device (typically resulting in a quadruple allowance). For a 3-pole, 4-wire grounding device wired to 26 AWG, 18 AWG, and 110 AWG equipment grounding conductors, that would mean 35.5 cu. inches, or 40.5 cu. in. if there is a clamp in the box. A 4 11/16 in. square by 2 1/8 in. deep box could accommodate this easily, especially after a mud ring goes on. The panel was told that some nonmetallic boxes intended for such use have smaller volumes that would be invalidated by this sort of rule change. Nevertheless, I think such a requirement makes common sense. It would be worded as follows:
"For large devices or equipment installed within a box and using multigang yokes or straps, or requiring comparable mounting space, a double volume allowance shall be made for each gang or equivalent space."

9-71 Log #1272 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Scott R. Creighton, Creighton Engineering Inc.
Comment on Proposal No: 9-34
Recommendation: Accept original proposal as submitted.
Substantiation: 314.18(B)(4) is antiquated in terminology and fails to address current technology. The methodology of equating 2 wire count as "equivalent" to a device (volume) is insufficient in maintaining the original intent of the code. Boxes become too full when providing a larger device and code acceptable wires such that boxes are overcrowded. The issues of excess heat and damage to conductors or devices readily occurs with today's devices. This problem will not go away by foisting it off onto manufacturers to require larger boxes because competitive pricing dictates the poor condition. A code change is needed to alleviate this fire safety issue.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-72 Log #1273 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Douglas S. Barnard, IBEW Local Union #73
Comment on Proposal No: 9-34
Recommendation: Accept the original proposal as submitted.
Substantiation: In deciding not to accept this proposal, it appears the panel is allowing semantics, the definition of a yoke, to detract from addressing the true issue, which is providing safe wiring space for non-standard size electrical devices. An issue, which in this instance is currently inadequately addressed by the NEC, based on the size and number of conductors attached to the device without any regard for the actual size or space requirements of the device. Creating a situation that is further complicated by manufacturers recommending box sizes for their devices in compliance with those NEC requirements.

It is the responsibility of the NEC to establish minimum requirements for safe electrical installations. I would, therefore, request that Code-Making Panel 9 carefully review the proposal, to address the problem Mr. Hartwell acknowledges exists in his reference to "of sufficient size" from 314.16. The NEC as a living document provides for and mandates revision to meet the continually changing need of providing safe electrical installations. A need, which this proposal meets in the development of a more appropriate criterion for determining the required size box, for non-standard size devices.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-73 Log #2835 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: James Hoctor, LifeLine Safety Consultants
Comment on Proposal No: 9-34
Recommendation: Accept original proposal, as submitted.
Substantiation: As a safety/risk management specialist, amateur electrician and rationale evaluator, I cannot comprehend why this proposed code revision has not been objectively evaluated and enthusiastically adopted, in the distant past. Extensive knowledge concerning electrical principles is not required to formulate that conclusion. A code allowance that creates hazardous conditions (excessive heat generation, ground fault/electrical short conditions, etc.) through the installation of electrical apparatus, in an unreasonably limited space, is inexcusable, especially when the relevant equipment is intended to provide warning concerning an emergency situation. An equipment malfunction precludes that potentially lifesaving advisement. The malfunction period is extended during the performance of lengthy system evaluation and repair procedures. These dangerous conditions are avoidable by reconsideration and subsequent adoption of this timely, potentially lifesaving code revision.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-74 Log #2945 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Allen C. Shallbetter, Washington State University
Comment on Proposal No: 9-34
Recommendation: Accept original proposal as submitted.
Substantiation: 2002 NEC 314.16(B)(4) refers to devices or equipment mounted in the box by means of a yoke or strap, but I find no definition of exactly what constitutes a yoke or strap. The fill allowance for devices mounted on a yoke or strap of double the volume indicated in Table 314.16(B) does not allow adequate space for the installation of large devices such as fire alarm horn/strobes and speaker/strobes. I believe that the committee's contention that these devices are not strap or yoke mounted is not correct, particularly in light of the absence of a definition of a yoke and/or strap in Article 100. These devices have a mounting plate (to which the components are attached) that mounts the device to the box. I see no significant difference, other than size of the device, between this mounting scheme and that of a switch or receptacle. I have experienced the problems associated with applying the current 314.16(B)(4) to these types of devices. On one of our recent construction projects, the fire alarm contractor mounted speaker/strobes in a standard electrical box as was indicated by the manufacturer as an acceptable mounting option. In the process of "stuffing" the devise with attached 4-#14 solid THHN conductors and 2-#14 Twisted Shielded Pair cables into the box, solder connections to the terminal strip on the device were fractured on some devices. On other devices, wires were pinched in the box causing intermittent ground faults on the system. When we requested that the boxes be replaced with larger ones, he argued that the box size met the requirements of the code; which it did, according to the fill calculations of 314.16(B)(4). Thus, we bore the expense of a costly contract change order to get boxes that would truly accommodate the devices. Many of these larger volume devices are life safety devices and I feel that it is imperative that the NEC provides specific direction to insure that this type of device is installed in boxes that will provide adequate clearance for the devices and all associated wiring. I urge the committee to accept the proposal as submitted by Mr. Hagarty.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-75 Log #3287 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: James Macklin Lewiston, ID
Comment on Proposal No: 9-34
Recommendation: Accept original proposal as submitted.
Substantiation: NEC 314.16(B)(4) does not address problems I have experienced in the field with fire alarm systems. The problems are shorting caused by pinched protective sheathing and ground faults. Article 314.16(B)(4) allows too many conductors in the small installation boxes creating overcrowding. When audio visual notification appliances are installed in the same box the problem of overcrowding is compounded. I believe that the construction of the audio visual appliances meet the definitions of yoke and strap. By accepting the proposal I believe that the reliability of fire alarm systems will improve dramatically. For the sake of life safety I urge that article 314.16(B)(4) incorporate the new wording of the original proposal as submitted.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-76 Log #3369 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Larry D. Elliott, E3 - Elliott Electrical Engineering
Comment on Proposal No: 9-34
Recommendation: We strongly agree with the new text as proposed originally proposed by Bob Hagarty in the ROP.
Substantiation: I am a consulting engineer and am acutely aware of the NEC shortcomings in the area of box fill. The revisions proposed by Bob Hagarty will be greatly welcomed in requiring what we are already having to require in our specifications for new fire signaling projects. The new text is long overdue.

Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-77 Log #3436 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Kip Conley, Power City Electric
Comment on Proposal No: 9-34
Recommendation: Accept original proposal as submitted.
Substantiation: As an electrical contractor, we have installed numerous fire alarm systems. The larger systems that require speaker strobes have often been plagued with ground faults or shorted conditions when mounting these devices to 4 square boxes. We believe that the NEC should add the requirement to use larger boxes, thus improving the installation methods of these life safety devices. We also believe strongly that this will provide cost savings for contractors and owners.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-78 Log #3469 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Robert Hagarty, RANDL Industries, Inc.
Comment on Proposal No: 9-34
Recommendation: Please accept original proposal as submitted.
Substantiation: By definition a yoke is: any frame connecting two parts; something that joins or unites; a clamp that holds two parts firmly in place. This is exactly how this equipment is constructed and a closer examination would reveal this fact. I respectfully believe the committee to be incorrect in stating the equipment in question do not have yokes.

The idea that a device or equipment must have a yoke or strap is irrelevant to the fact that devices and equipment are going to consume space and be attached to an outlet or device box. I think what is critical here is the fact that if any device or equipment is going to consume space in a device or outlet box it is imperative that the volume displacement be considered whether the device or equipment is supported or not supported by a yoke or strap.

As an alternative to the yoke issue I ask the committee to allow a variation of language, which does not depart from the original scope and concept of this proposal such as:

314.16(B)(4) ~~For each yoke or strap containing one or more devices or equipment, a double volume allowance in accordance with Table 314.16(B) shall be made for each yoke or strap based on the largest conductor connected to a device(s) or equipment supported by that yoke or strap.~~

314.16(B)(4) For each device(s) or equipment attached to an outlet or device box, the cubic inch displacement of the device(s) or equipment in the box shall be deducted from the volume of the box and shall not exceed 35%. The remaining volume of the box shall be used to determine conductor allowances in accordance with Table 314.16(B).

The committee's response that manufacturers should recommend box size is exactly the problem. They recommend box size based upon the existing code, which is the cause of the problems substantiated in this proposal. I originally submitted examples of proof that manufacturers typically recommend the size of box that code allows.

Mr. Hartwell stated this type of equipment should be considered as two and have a resulting quadruple conductor allowance. Unfortunately, even a quadruple allowance does absolutely nothing to resolve the problems.

Example, a piece of equipment 26 cu. in. size is installed in a 51 cu. in. box, if we divide 51 by 2 for a #14 awg conductor per Table 314.16(B) it equals 25 conductors. If we now take a quadruple conductor allowance as suggested it equals 21 #14 awg conductors. The equipment only requires a maximum of 8 conductors; therefore, there is no positive impact in regards to a quadruple allowance. It all relates back to the physical size of the device or equipment.

The concept of trying to relate the free air space of a conductor as required by Table 314.16(B) to the actual sizes of devices or equipment defies physical logic. Historically, when devices were of sizes approximating 3-4 cu. in. this method may have been marginally acceptable, but for the last 30 years has lost relevancy.

The purpose of the NEC according to Article 90.1(A) is the practical safeguarding of persons and property from the hazards arising from the use of electricity.

The code reference in question has the opposite effect by allowing devices and equipment to dramatically reduce the free air space requirements of Table 314.16(B) by as much as 50 percent and also allows the installation of oversized devices and equipment in undersized boxes which seems anything but practical.

The practicality of the free air space of two conductors remotely being equal to the physical sizes of today's devices and equipment has been lost.

The concept of basing device or equipment sizes upon the size of conductors terminated on those devices or equipment relative to box fill has long outgrown itself.

It is not practical to think an electrical inspector may be present during the installation process to determine whether or not a box is "of sufficient size" especially when the box is specified by the manufacturer.

It is not practical to use a method that causes ground faults and short circuits simply because there is not enough space for the device or equipment and conductors especially in a life safety system just when it may be needed to protect life and property.

I believe it is time for this code committee to acknowledge these facts and require device and equipment fill be determined by the actual volumes of the devices and equipment in conjunction with a maximum allowable percentage of box fill by devices and equipment.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-79 Log #3896 NEC-P09 **Final Action: Reject**
(314.16(B)(4))

Submitter: Mark R. McKay, SimplexGrinnell
Comment on Proposal No: 9-34
Recommendation: Accept original proposal as submitted.
Substantiation: The back boxes specified by manufacturers for the installation of specialty fire alarm devices such as speakers, speaker/strobes, chimes, relay modules, synchronization modules, multi-point input/output devices, interface devices, addressable circuit isolation devices, and over voltage modules is entirely inadequate for the number of wires that need to be terminated. It is common experience to find 30 percent of preinspection fire alarm field device failures to be the result of damaged conductors resulting from forced insertion of large electronic packages into boxes that are too small. Manufacturers are forced by market conditions to specify common trade boxes because they are "allowed" by the code. Wiring faults in a the field are not an issue for the device manufacturer so they continue to develop and sell larger packages. However, this arrangement is serious problem for the owner during installation and when future repairs need to be made.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-62.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-80 Log #145 NEC-P09 **Final Action: Reject**
(314.20)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 9-46
Recommendation: Accept through "enclosure" and delete the rest.
Substantiation: The basic issue is whether the installation is basically free of electrical/fire hazard. If the cover fits tightly, the box can be flush, sticking out, or recessed, and it will do its job sufficiently. No evidence has been offered to suggest otherwise.
Panel Meeting Action: Reject
Panel Statement: CMP 9 reaffirms its panel statement on Proposal 9-46. The submitter has not provided any additional technical substantiation in the comment to change the Code. The exception as discussed in the comment would not make a complete sentence and would violate the requirements of the NEC Style Manual. See panel action on Comment 9-83.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-81 Log #2561 NEC-P09 **Final Action: Accept**
(314.20)

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 9-43
Recommendation: Accept the Panel Action with the following amendment: Delete the term "domed cover".
Substantiation: This term is not defined in the NEC or other recognized industry standards for electrical boxes and covers.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-82 Log #2905 NEC-P09 **Final Action: Accept**
(314.20)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 9-43
Recommendation: The Panel's revised wording should be further revised by removing the references to "domed covers".
Substantiation: "Domed covers" are not defined in the NEC, the reader must assume that a domed cover is the in-use weatherproof covers design to protect the plug and receptacle in a wet locations when in used per 406.8(B). These covers are also know as "bubble covers" and "hooded covers".

Covers of any style does not need to be addressed in this section since this section is written to address the depth of boxes, plaster rings and extenders to the surface of the wall.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-83 Log #2023 NEC-P09 **Final Action: Accept**
(314.20 Exception (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-46
Recommendation: Accept the proposal in principle. Do not create an exception. In 314.20, insert the words "employing a flush-type cover or faceplate" after the word "boxes" in the first paragraph.
Substantiation: Just as in the case of surface panels that are recessed to some degree, it seems excessive to specify a surface-setback limitation for a box arrangement that assumes no surface treatment need be brought to it in the first place. For example, imagine a typical weatherproof aluminum metal box mounted on a wall with a surface cover. What is the point of a setback limitation on this box if now someone insulates the wall and it falls 1/2 inch behind the wall finish? 314.29 still requires the wiring to be accessible. I doubt this will be used too often, but I can find no safety reason to object to the practice.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-84 Log #144 NEC-P09 **Final Action: Accept in Principle**
(314.21)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 9-49
Recommendation: Accept, minus "~~is not recessed, and~~".

Substantiation: The CMP said in response to Proposal 9-47, that the safety purpose of this section, justifying its retention, is to prevent access to live parts. When a Listed cover mates tightly against the box, it prevents any such access, or the NRTL has fallen down on the job.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 9-85.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-85 Log #2025 NEC-P09 **Final Action: Accept**
(314.21 Exception (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-49
Recommendation: Accept the proposal in principle. Do not create an exception. Insert the words "around boxes employing a flush-type cover or faceplate" after the word "incomplete". Delete "or fitting" at the end of the sentence.
Substantiation: Just as in the case of surface panels that are recessed to some degree, it seems excessive to require surface repairs around a box arrangement that assumes no surface treatment need be brought to it in the first place. For example, imagine a typical weatherproof aluminum metal box mounted on a wall with a surface cover. What is the point of a wall repair requirement around this box if now someone insulates and finishes the wall, and the drywall work around the box is messy? The literal text of the current NEC would have no objection if the drywall were never installed, but if it were, then the repair would have to be complete. This doesn't make any sense. The "or fitting" deletion is because the fitting referred to is a conduit body, and conduit bodies never have flush covers, inky surface covers. Since this comment would limit the reach of this rule to locations where flush covers are anticipated, there is no point to retaining the reference.
Panel Meeting Action: Accept
Panel Statement: CMP 9 accepts the recommendation; however, it assumes that "inky" surface covers are "only" surface covers.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-86 Log #1928 NEC-P09 **Final Action: Reject**
(314.23(B)(1))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 9-50
Recommendation: Revise text to read as follows:
Exposed screw threads ~~Screws~~ shall not be permitted to pass through the box. ~~Unless exposed threads in the box are adequately protected to avoid abrasion of conductor insulation.~~
Substantiation: There are many various mounting methods for mounting of boxes, screws just being one of the methods. But, to allow screws with protection using approved means is vague and unclear as to how the protection shall be accepted by various jurisdictional locations. It is very difficult to install any device in the back 6 mm (1/4 in.) of a box. Please consider not allowing exposed screw threads only covered with an unknown material or device with conductors in a box, who knows how well the covering over threads will provide protection over the test of time and cause damage to conductors.
Panel Meeting Action: Reject
Panel Statement: There are many different methods to protect conductors from abrasion created by screw threads.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-87 Log #2351 NEC-P09 **Final Action: Reject**
(314.23(B)(1))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 9-50
Recommendation: Revise text to read as follows:
Exposed screw threads ~~Screws~~ shall not be permitted to pass through the box. ~~Unless exposed threads in the box are adequately protected to avoid abrasion of conductor insulation.~~
Substantiation: There are many various mounting methods for mounting of boxes, screws just being one of the methods. But, to allow screws with protection using approved means is vague and unclear as to how the protection shall be accepted by various jurisdictional locations. It is very difficult to install any device in the back 6 mm (1/4 in.) of a box. Please consider not allowing exposed screw threads only covered with an unknown material or device with conductors in a box, who knows how well the covering over threads will provide protection over the test of time and cause damage to conductors.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 9-86.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-88 Log #381 NEC-P09 **Final Action: Reject**
(314.27(C))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 9-56
Recommendation: Accept proposal.
Substantiation: The exception permits boxes other than those listed for floor applications (standard type boxes). These boxes do not contain instructions for their use in floors. The present requirements of 314.20 do not cover installations in floors. The proposal relates to the exception.
Panel Meeting Action: Reject
Panel Statement: The listed cover required in this application will have instructions for the installation of the outlet box.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-89 Log #2906 NEC-P09 **Final Action: Reject**
(314.27(C))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 9-55
Recommendation: This proposal should be accepted as written.
Substantiation: The exception of 314.27(C) states: "Where the authority having jurisdiction judges them free from likely exposure to physical damage, moisture, and dirt,…"
These areas obviously have potential safety problems that require the AHJ to determine whether the application is safe or not. Listed floor boxes are approved for physical damage, moisture and dirt. These areas are also cleaned by steam cleaning equipment. Listed floor boxes are required to past a scrub water requirement for this reason.
It is my understanding that this exception was allowed because at that time the only floor boxes available were the type for concrete encasement. These boxes were difficult to install and were costly. Today there are several styles of inexpensive, non-concrete encased, listed floor boxes that can be used in this application.
Panel Meeting Action: Reject
Panel Statement: The availability of a "new" product is not adequate substantiation that a problem exists with the current product or practice.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-90 Log #2907 NEC-P09 **Final Action: Reject**
(314.27(E) (New))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 9-59
Recommendation: This proposal should be accepted as written:
(E) Outlet Boxes in a Ceiling. Single gang outlet boxes not larger than 57mm x 100mm (2 1/2 in. x 4 in.) and round or octagonal outlet boxes not larger than 100mm (4 in.) in diameter are permitted to be installed in a ceiling for receptacles, smoke detectors or any device not defined as a luminaire and that weighs 3 kg (6 lbs) or less.
Substantiation: This was submitted for clarification. Even the Panel Statement admits that there is confusion by stating "CMP-9 recognizes confusion with regard to this issue and recommends coverage in the NECHB." The confusion can be addressed by accepting the proposed language. The NECHB is not an enforceable book and very few contractors and inspectors carries the NECHB with them. The new text makes it clear and user friendly that these types of boxes are permitted in the ceiling. Round or octagonal boxes listed as outlet boxes and are not marked for Luminaire support should not be excluded from this rule.
Panel Meeting Action: Reject
Panel Statement: The comment describes a single-gang outlet box, which is a contradiction in terms, and then limits the weight bearing capacity of a true outlet box, for which there is also no substantiation. The panel reaffirms that the NEC text as written does not prohibit the proposed installation.
Smoke detectors and carbon monoxide detectors are not luminaires or lampholders and are not required to be mounted to boxes designed for that purpose.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
HARTWELL: This section of the NEC is deficient in that it fails to address non-lighting equipment supported by an outlet box. I expect to propose the following wording for the 2008 cycle (The Exception is necessary because the device box Exception in 314.27(A) only applies to wall-mounted applications.):
"Add a new 314.27(E) as follows:
E. Utilization Equipment. Boxes used for the support of utilization equipment other than ceiling-suspended (paddle) fans shall meet the requirements of 314.27(A) and (B) for the support of a luminaire (fixture) of comparable size and weight.
Exception: Utilization equipment weighing no more than 3 kg (6 lb.) shall be permitted to be ceiling mounted."

16-7 Log #604a NEC-P16 **Final Action: Accept**
(314.28(A))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-61
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panels 3 and 16 for action in their respective articles. This action will be considered by Code-Making Panels 3 and 16 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: CMP 16 accepts the direction of the TCC to review Proposal 9-61.
CMP 16 agrees with CMP 9's rejection of Proposal 9-61.
This is a workmanship issue. The installation of communication raceways is covered in Proposals 16-81 and 16-82 with a reference to ANSI-NECA-BICSI-568-2001, Standard for Installing Commercial Building Telecommunication Cabling, in an FPN in 800.8 (New).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 15

3-91 Log #604 NEC-P03 **Final Action: Accept**
(314.28(A))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-61
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panels 3 and 16 for action in their respective articles. This action will be considered by Code-Making Panels 3 and 16 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the TCC and rejects the proposal.
Panel Statement: Section 725.3 exempts Class 1, 2, and 3 circuits from compliance with Article 300, and 760.3 exempts fire alarm circuits from compliance with Article 300, unless specifically referenced to a section with Article 300. If Chapter 3 wiring methods are used, Articles 725 and 760 require compliance with those requirements that are specific to that wiring method. This would include the requirements in 314.28(A) for sizing of pull and junction boxes, as well as conduit bodies. Since the cables used in these systems normally have much smaller internal conductors, the cable may be large but is much more flexible than power cables of a similar overall size. Where internal conductors are 4 AWG or larger, the cables must use the same dimensions as required for power conductors.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

9-91 Log #143 NEC-P09 **Final Action: Reject**
(314.29)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 9-69
Recommendation: Accept with the word "~~concealed~~" replaced with "hidden".
Substantiation: The CMP is correct that I misspoke when I talked of concealment generally being legal; I had in mind the colloquial rather than the Article 100 meaning of the term. Surely if Mr. Hartwell's contractors are not forced to rely on patience and luck to discover hidden j-boxes under loose aggregate, they shouldn't have to do so inside structures. Digging up gravel is less of an imposition than is chopping holes in walls and ceilings when circuit tracers are ineffective.
Panel Meeting Action: Reject
Panel Statement: The panel continues to reject the proposal because the NEC does not allow boxes to be installed in an area hidden by structural features. Wall and ceiling finishes should not be required to be removed if boxes are accessible, as required by 314.29 as presently worded. The present language in the exception to 314.29 does permit concealment of boxes.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-92 Log #466 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Kenneth L. Groves, Edwards Electric Corp.
Comment on Proposal No: 9-68
Recommendation: I agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-93 Log #474 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: James G. DiLullo, Dynaelectric Company, Florida
Comment on Proposal No: 9-68
Recommendation: I agree with the proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-94 Log #502 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Vernon Jay Franke, Jr., Construction Consultants of Florida Inc.
Comment on Proposal No: 9-68
Recommendation: I agree with the proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-95 Log #675 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Ron Morgan, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-96 Log #682 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Kevin J. Nuss, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-97 Log #689 NEC-P09 **Final Action: Accept**
(314.29 (New))

Submitter: Donald J. Hicks, Florida Electric Contracting Service Inc.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-98 Log #709 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Joseph DeRosa, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-68
Recommendation: I agree with the proposed text.

Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-99 Log #728 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Pascal McFadden, Florida Electric Contracting Service, Inc.
Comment on Proposal No: 9-68
Recommendation: I agree with the proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-100 Log #870 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Steven Siems, Florida Electric Service Co. Inc. / Rep. Neca South Florida
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-101 Log #877 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Harold K. Siems, Florida Electric Service Co. Inc.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-102 Log #1286 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Paul Yesbeck, Acolite Claude United Sign Co.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-103 Log #1345 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Victor Lombardi, Miami-Dade County Building Department
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-104 Log #2854 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Jose Gonzalez, Miami Dade Bldg. Department
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-105 Log #3082 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Steven Gilbert, Miami Dade Building Department
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-106 Log #3088 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Billy Jackson, Miami Dade County Building Department
Comment on Proposal No: 9-68
Recommendation: I agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-107 Log #3463 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Arnold M. Velazquez, Arnold & Associates Inc.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-108 Log #3633 NEC-P09 **Final Action: Accept**
(314.29)

Submitter: Stephen Kovach, Dade County Building & Zoning Dept.
Comment on Proposal No: 9-68
Recommendation: Agree with proposed text.
Substantiation: This recognizes the established use of bottomless enclosures as long as they are accessible.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-109 Log #923 NEC-P09 **Final Action: Accept in Principle**
(314.30)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 9-68a
Recommendation: As stated in the Explanation of Negative by Mr. Young, the panel should have voted to accept this proposal in part. The proposal as written should have been accepted as written with the words "shall be listed" removed from the first sentence of 314.40 making the first sentence read:
"314.30 Handhole enclosures. Handhole enclosures shall be designed and installed to withstand all loads likely to be imposed."
Substantiation: Technical substantiation was not provided in the original proposal showing the need for listing of these devices. This issue is similar to the Code-Making Panel 9's rejection of Proposal 9-60.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-111.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-110 Log #1028 NEC-P09 **Final Action: Accept in Principle**
(314.30)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 9-68a
Recommendation: This proposal should have been accepted in part. The requirement for listing should be deleted.
Substantiation: I agree with the Explanation of Negative by Mr. Young. The need for listing of these enclosures has not been demonstrated. Concrete boxes of this type have been used for many years for street lighting and similar installations. Similar products made by the same companies who make other precast concrete products are used without listing (most concrete rings that support

manholes and the manholes themselves are of this type and do not require listing). Many other types of boxes covered by Article 314 are not required to be listed. The only reason for requiring listing at this time (based on previous experience with these products) is to support the products of certain manufacturers. Often handholes that will easily withstand vehicle traffic are used in landscaped areas where they will not even be exposed to pedestrian traffic. The requirement to withstand loads likely to be imposed is adequate, consistent with substantial field experience, and not preferential to any particular manufacturer.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-111.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-111 Log #2026 NEC-P09 **Final Action: Accept in Principle**
(314.30 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-68a
Recommendation: Accept the proposal in principle. Delete the phrase "shall be listed and".
Substantiation: The listing requirement is excessive at this time, and varies from the official CMP 9 comment on Proposal 1-109 developed subsequently to the acceptance of this proposal with respect to the formal Article 100 definition of this equipment. That comment envisions the use of the adjective "identified" instead of "listed." This section should not impose a requirement that varies from the definition. The CMP 9 recommended definition follows: Handhole Enclosure. An enclosure identified for use in underground systems, provided with an open or closed bottom, sized to allow personnel to reach into, but not enter, for the purpose of installing, operating or maintaining equipment or cable or both.
Panel Meeting Action: Accept in Principle
Accept the recommendation of the comment as written. In addition, in the paragraph addressing covers, editorially change "their function" to "the function of the enclosure."
Include the action on Comments 9-56 and 9-112, so the new 314.30 will read as follows: 314.30 Handhole Enclosures. Handhole enclosures shall be designed and installed to withstand all loads likely to be imposed.
FPN: See ANSI/SCTE 77-2002, Specification for Underground Enclosure Integrity, for additional information on deliberate and nondeliberate traffic loading that can be expected to bear on underground enclosures.
(A) Size. Handhole enclosures shall be sized in accordance with 314.28(A) for conductors operating at 600 volts or below, and in accordance with 314.71 for conductors operating at over 600 volts. For handhole enclosures without bottoms where the provisions of 314.28(A)(2), Exception, or 314.71(B)(1), Exception No. 1; apply, the measurement to the removable cover shall be taken from the end of the conduit or cable assembly.
(B) Wiring Entries. Underground raceways and cable assemblies entering a handhole enclosure shall extend into the enclosure, but they shall not be required to be mechanically connected to the enclosure.
(C) Handhole Enclosures Without Bottoms. Where handhole enclosures without bottoms are installed, all enclosed conductors and any splices or terminations, if present, shall be listed as suitable for wet locations.
(D) Covers. Handhole enclosure covers shall have an identifying mark or logo that prominently identifies the function of the enclosure, such as "electric." Handhole enclosure covers shall require the use of tools to open, or they shall weigh over 45 kg (100 lb). Metal covers and other exposed conductive surfaces shall be bonded in accordance with 250.96(A).
Panel Statement: CMP 9 made an editorial change addressing covers to clarify the intent of the marking. The panel has also considered information in Comment 9-56 dealing with conductors, splices and terminations within a handhole enclosure. CMP 9 has included a requirement for conductors, splices, and terminations rated for wet locations, rather than the requirement for direct burial conductors, splices, and terminations. The two classifications differ only in that direct burial conductors, splices, and terminations must pass an impact loading test, which is not necessary for the inside of a handhole enclosure.
The fine print note was included from Comment 9-112.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-112 Log #3595 NEC-P09 **Final Action: Accept**
(314.30)

Submitter: Jeff Zager, Strongwell
Comment on Proposal No: 9-68a
Recommendation: Add Fine Print Note prior to subsection (A) to read:
FPN: See ANSI/SCTE 77-2002, Specification for Underground Enclosure Integrity, for additional information on deliberate and non-deliberate traffic loading that can be expected to bear on underground enclosures.
Substantiation: The proposed Fine Print Note closely follows the FPN in 110.71 for manholes. ANSI/SCTE 77 more fully explores the level of loading between pedestrian and truck traffic. This allows the end user to more closely match enclosure to application and save money while maintaining safety.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

ARTICLE 320 — ARMORED CABLE: TYPE AC

7-7 Log #906 NEC-P07 **Final Action: Accept in Principle**
(320, 320-2 & 320-10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-8
Recommendation: Reinstate the deleted text, to add back into the NEC as removed in this proposal.
Wording should be as in 320.10 in the 2002 NEC.
Substantiation: The deletion of Uses Permitted in all the wiring method sections creates a disaster waiting to happen.
It is much easier for users, installers and engineers and inspectors to have included both Uses Permitted and Uses Not Permitted.
This is in conflict with the NEC Style Manual and makes the NEC very "user unfriendly".
See comment with my negative ballot.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-8 Log #2035 NEC-P07 **Final Action: Reject**
(320.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-7
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.
The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.
Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: The panel accurately states that there are several methods of approving products however; the requirements for listing in the NEC is well established and accepted. Requiring a product to be listed would establish a benchmark for what these products should be capable of consistently delivering. The requirement for listing would not prohibit the AHJ from exercising its right to waive specific requirements of this code in accordance with Article 90.4.
CANGEMI: The proposal should be accepted. Most of the cables used today are listed. The panel affirms their position that a requirement for listing would exclude all other methods for acceptance, and would limit the discretion of the authority having jurisdiction to use means other than listing to determine acceptability for special circumstances. Listing is based on compliance with recognized product standards. Non-listed cables may not have been evaluated for compliance with such requirements, and in some cases lack of such compliance may make it difficult to determine acceptance in the field. For example, a non-listed cable may not function correctly with Listed termination fittings. Methods of acceptance other than listing may not be available to the authority having jurisdiction.
The authority having jurisdiction has always had the authority to exercise special judgement for special circumstances. A requirement for listing would not eliminate such authority.
SCHUMACHER: The panel is correct in saying that there are several methods of approving a product, but if a product is not required to be listed, the installer is not required to use any of them.
STEWART: Justification: We feel that the requirement of listing for wire and cable products is mandatory. Listing adds an additional measure of testing to approve the product for its use by an independent agency. This provides the installer a method to identify standard products.
Clarification: The 2003 NEC Style Manual, 3.2.5.3. Listed by a Nationally Recognized Testing Laboratory notes the use of terms "Nationally Recognized

Testing Laboratory" or "NRTL" shall be avoided. The definition of "listed" in Article 100 provides the details necessary for application of the NEC. The Nationally Recognized Testing Laboratory Program, also known as NRTL, is an OSHA program for the accreditation laboratories that test products for the workplace and is not to be applied generally in the NEC.

7-9 Log #3123 NEC-P07 **Final Action: Reject**
(320.6 (New))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-7
Recommendation: The proposal should be accepted.
Substantiation: Contrary to the panel statement, requiring listing as proposed would not prohibit the AHJ from exercising its right to waive specific requirements in this Code in accordance with 90.4. Requiring that this product be listed would establish a benchmark for what these products should be able to deliver consistently. For example, the reliability of metallic armor of Type AC cable, the connector, and the locknut of the connector all play a critical role in providing a permanent and effective grounding path to facilitate the operation of overcurrent devices. Requiring that these products be listed will go a long way toward achieving that goal. This Comment represent the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-8.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-10 Log #965 NEC-P07 **Final Action: Accept in Principle**
(320.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-10 to "Reject" Proposal 7-8 and that the action on Comment 7-14a includes the accepted wording for 320.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-8
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-11 Log #2093 NEC-P07 **Final Action: Accept in Principle**
(320.10)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-8
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA should be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-12 Log #2417 NEC-P07 **Final Action: Accept in Principle**
(320.10)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 7-8
Recommendation: Revise the existing text of the 2002 NEC as follows:
320.10 Uses Permitted. Type AC cable shall be permitted to be used in all buildings, structures, and locations unless prohibited or restricted by 320.12 or by other articles of this Code.
Substantiation: Deletion of the list of uses permitted may, in ways, be more user-freindly but we believe unless the above language is added it will create confusion and issues of differing interpretation and application of the Code. Having only a Section 320.12 that lists the uses not permitted still leaves open the question of, "What uses are permitted?"

The text proposed by this Comment clearly states the permitted uses and furthers the usability of the Code, which is the substantiation for the original proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-13 Log #2432 NEC-P07 **Final Action: Accept in Principle**
(320.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-8
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"320.10 Uses Permitted.
Where not subject to physical damage, Type AC cable shall be permitted as follows:
(1) In both exposed and concealed work
(2) In cable trays where identified for such use
(3) In dry locations
(4) Embedded in plaster finish on brick or other masonry, except in damp or wet locations
(5) To be run or fished in the air voids of masonry block or tile walls where such walls are not exposed or subject to excessive moisture or dampness".
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same

reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-14 Log #3125 NEC-P07 **Final Action: Accept in Principle**
(320.10)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-8
Recommendation: The proposal should be rejected.
Substantiation: The change accepted by CMP 7 negatively impacts usability. Additionally, we have concerns that not all of the changes are merely editorial in nature and without change in application. This Comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-14a Log #CC700 NEC-P07 **Final Action: Accept**
(320.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-8
Recommendation: Reinstate 320.10 to read as follows: "320.10 Uses Permitted.Type AC cable shall be permitted as follows and in other locations and conditions not prohibited by 320.12 or elswhere in the Code:

(1) In both exposed and concealed work
(2) In cable trays
(3) In dry locations
(4) Embedded in plaster finish on brick or other masonry, except in damp or wet locations
(5) To be run or fished in the air voids of masonry block or tile walls where such walls are not exposed or subject to excessive moisture or dampness

FPN: The "Uses Permitted" is not an all-inclusive list."

Substantiation: The deletion of 320.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness while making it clear that the list of "Uses Permitted" is not an all-inclusive list. The panel action on Proposal 7-9 was incorporated into the revised text.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:

DALY: NEMA does not find it appropriate to add the phrase "and in other locations and conditions not prohibited by 320.12 or elsewhere in the Code", and it should be deleted. NEMA considers this phrase to be new material, and is particularly concerned with the impact this could have on specialized Articles without having had appropriate review by other panels and other interested parties.

SCHUMACHER: I would like to congratulate Code-Making Panel 7 for all of the work that took place to reinsert XXX-10 back into the Code. This makes the NEC much more user-friendly, and keeps the code more accessible to the person in the field.

7-15 Log #220 NEC-P07 **Final Action: Accept in Principle**
(320.10, 322-10, 326-10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-15 to "Reject" Proposal 7-8 and that the action on Comment 7-14a includes the accepted wording for 320.10.
Submitter: Vincent Rodriguez, County of Clara, California Building Inspector/Electrical
Comment on Proposal No: 7-8
Recommendation: I recommend that the proposal to delete the "uses permitted" sections of various wiring methods be rejected.
Substantiation: As a senior electrical inspector, planchecker, and former electrical contractor, I have relied on the "uses permitted" sections. Deleting this section will make the code less clear, less user friendly, and add time, confusion, and extended debates on interpretation. The expanding or rewording of "uses not permitted" may be helpful, but deletion of "uses permitted" should not be done.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Committee Comment 7-14a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-16 Log #142 NEC-P07 **Final Action: Reject**
(320.10(6))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 7-10
Recommendation: Change 320.30(B)(1), adding "or under" after "in".
Substantiation: The term, "crawlspace," in the original substantiation was not intended to add crawlspaces deep enough to permit installers not just access but the ability to move through them so as to enable securing cables. In very shallow under-building spaces supporting may be impracticable, and so qualify under this clause. The issue of moisture, etc., is addressed by 320.10(3), which 320.30(B)(1) does not override.
Panel Meeting Action: Reject
Panel Statement: Section 320.30(B)(1) addresses the submitter's concern.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-17 Log #2094 NEC-P07 **Final Action: Accept in Principle**
(320.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-12
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA should be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-19a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-18 Log #2433 NEC-P07 **Final Action: Accept in Principle**
(320.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-12
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"320.12 Uses Not Permitted.
Type AC cable shall not be used as follows:
(1) In theaters and similar locations, except where permittedin 518.4
(2) In motion picture studios
(3) In hazardous (classified) locations except where permitted in
a. 501.4(B), Exception
b. 502.4(B), Exception No. 1
c. 504.20
(4) Where exposed to corrosive fumes or vapors
(5) In storage battery rooms
(6) In hoistways, or on elevators or escalators, except where permitted in 620.21
(7) In commercial garages where prohibited in 511.4 and 511.7"
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-19a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-19 Log #3124 NEC-P07 **Final Action: Accept in Principle**
(320.12)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-12
Recommendation: The proposal should be rejected.
Substantiation: We recognize the considerable effort put forth by the task group charged with integrating uses permitted/not permitted but, feel this change accepted by CMP 7, in conjunction with the action on proposal 7-8, negatively impacts usability. Additionally, we have concerns that not all of the changes are merely editorial in nature and without change in application. This Comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-19a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-19a Log #CC701 NEC-P07 **Final Action: Accept**
(320.12)

Note: The Technical Correlating Committee directs that item (4) of the 2002 NEC which reads: "(4) Where exposed to corrosive fumes or vapors." be retained in 320.12 as noted in the Explanation of Negative Vote.
Submitter: Code-Making Panel 7
Comment on Proposal No: 7-12
Recommendation: Revise 320.12 to read as follows: "320.12 Uses Not Permitted
Type AC cable shall not be used as follows:
(1) Where subject to physical damage.
(2) In damp or wet locations
(3) In air voids of masonry block or tile walls where such walls are exposed or subject to excessive moisture or dampness.
(4) Embeded in plaster finish on brick or other masonry in damp or wet locations".
Substantiation: The panel action on this panel comment will correlate with the panel action on Committee Comment 700, which added the "Uses Permitted" back into the Code. The panel actions on the following proposals were incorporated into this Committee Comment: 7-11, 7-12, and 7-13.
The panel actions on the following comments were incorporated into this Committee Comment: 7-17, 7-18, 7-19, and 7-20.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
SCHUMACHER: I think in the pressure of the moment, the panel inadvertently left out item No. 4: "Where exposed to corrosive fumes or vapors" in "Uses Not Permitted."

7-20 Log #2418 NEC-P07 **Final Action: Reject**
(320.12(1))

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 7-12
Recommendation: Revise the proposed text of the 2002 NEC ROP Draft as follows:
320.12 Uses Not Permitted. Type AC cable shall not be used as follows:
(1) Where subject to physical damage unless provided with suitable protection against physical damage by means such as construction methods, running boards, guard strips, elevation or isolation.
Substantiation: Within the context of the new format of specifying only "not permitted uses", simply stating that the cable shall not be used where subject to physical damage can be interpreted to mean that the cable could not be used even if protection was provided such as with a sleeve or being inaccessible based on distance or location such as 320.15.
Panel Meeting Action: Reject
Panel Statement: Once the cable is protected, it is no longer subject to physical damage. Adding information on how to protect against physical damage is not necessary.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-21 Log #2419 NEC-P07 **Final Action: Accept**
(320.30)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 7-19
Recommendation: Revise existing Section 320.30 from the 2005 NEC ROP Draft as follows:
320.30 Securing and Supporting.
(A) General. Type AC cable shall be supported and secured by staples, cable ties, straps, hangers, or similar fittings, designed and installed so as not to damage the cable~~, at intervals not exceeding 1.4 m (4 12 ft) and within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting~~.
(B) Securing. Unless otherwise provided, Type AC cable shall be secured within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting and at intervals not exceeding 1.4 m (4 1/2 ft) where installed on or across framing members.
(C) Supporting. Unless otherwise provided, Type AC cable shall be supported at intervals not exceeding 1.4 m (4 1/2 ft).
(1) ~~(A)~~ Horizontal Runs ~~Through Holes and Notches. In other than vertical runs,~~ Cables installed in wooden or metal framing members or similar supporting means ~~accordance with 300.4~~ shall be considered supported ~~and secured~~ where such support does not exceed 1.4 m (4 1/2-ft) intervals ~~and the armored cable is ecurely fastened in place by an approved means within 300 mm (12 in.) of ech box, cabinet, conduit body, or other armored cable termination.~~
(D)~~(B)~~ Unsupported Cables. Type AC cable shall be permitted to be unsupported where the cable:

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

(2) Is not more than 600 mm (2 ft) in length at terminals where flexibility is necessary; or

(3) Is not more than 1.8 m (6 ft) in length from the last point of cable support to the point of connection to a luminaire(s) [lighting fixture(s)] or other ~~piece of~~ electrical equipment and the cable and point of connection are within an accessible ceiling. For the purposes of this section, Type AC cable fittings shall be permitted as a means of cable support. [ROP 7-19]

If the proposed revisions are accepted, the section will read as follows:

(A) General. Type AC cable shall be supported and secured by staples, cable ties, straps, hangers, or similar fittings, designed and installed so as not to damage the cable.

(B) Securing. Unless otherwise provided, Type AC cable shall be secured within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting and at intervals not exceeding 1.4 m (4 1/2 ft) where installed on or across framing members.

(C) Supporting. Unless otherwise provided, Type AC cable shall be supported at intervals not exceeding 1.4 m (4 1/2 ft).

(1) Horizontal Runs. Cables installed in wooden or metal framing members or similar supporting means shall be considered supported where such support does not exceed 1.4 m (4 1/2-ft) intervals.

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

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

(2) Is not more than 600 mm (2 ft) in length at terminals where flexibility is necessary; or

(3) Is not more than 1.8 m (6 ft) in length from the last point of cable support to the point of connection to a luminaire(s) [lighting fixture(s)] or other electrical equipment and the cable and point of connection are within an accessible ceiling. For the purposes of this section, Type AC cable fittings shall be permitted as a means of cable support.

Substantiation: This Comment intends to incorporate the Panel's action on Proposal 7-19 and the organization concepts from Proposal 7-20. We believe organizing the requirements in the above format will add clarity and uniform interpretation and application of the Code. We also believe that we have addressed the concerns expressed by the Panel in their Statement on Proposal 7-20 by removing the word "connector" from (A) and keeping the supporting distance at 4-1/2 ft.

The new subsection (A) General is proposed to give a title to the opening paragraph and include requirements here that apply generally.

The requirements for securing and supporting are separated into (B) and (C) as they are really two different issues. Someone used an analogy of a person and a car to illustrate securing and supporting. When the person sits on the car seat, they are supported by it. When the seat belt is fastened around them they are secured. In addition, cables are not secured every 4-1/2 ft where they pass through holes in framing members as the present language in the opening paragraph requires (supported and secured...at intervals not exceeding 1.4 m). This requirement should only apply where the cables are installed across or on framing members not through them.

The words "Through Holes and Notches" is proposed to be deleted from the title of (C)(1) as the requirement should apply to installations in other locations such as in on racks or brackets.

The phrase "In other than vertical runs" is proposed to be deleted from (C)(1) as the title of the section is "Horizontal Runs."

The reference to installing the cable in accordance with 300.4 is proposed to be removed from (C)(1) as 320.17 requires the installation be in compliance with 300.4(A), (C) and (D).

The words "or similar supporting means" are proposed to be added to (C)(1) as there are a lot of suitable and acceptable methods of supporting cables such as by strut, pipe racks, and brackets. The words "in holes and notches" are proposed to be deleted as the rule should apply to all horizontal runs, not only where cables pass through holes and notches.

"Unless otherwise provided" is proposed to be added to (B) and (C) as the provisions for Unsupported Cable in (D) acts like an exception to the general requirement.

We are proposing the word luminaries become plural (luminarie(s) [lighting fixture(s)] and the words "piece of" be deleted in (B)(3) [(D)(3)] to clarify the subsection is not limited to a single luminaire or piece of equipment.

It appears the Panel intended a second sentence on AC fittings be added to (B)(3) [(D)(3) in our reorganized text]. However, the panel statement directs that recommended wording in (B)(3) [(D)(3)] be replaced by the text "For the purposes of this section, Type AC cable fittings shall be permitted as a means of cable support." (NFPA staff apparently interpreted this to be the Panel's intent as the sentence appears in the 2005 NEC ROP Draft document.) This Comment includes the text as it appears in the ROP Draft.

Finally, these changes are primarily editorial and not substantive and no new concepts have been introduced that would require this Comment to be held for further study.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-22 Log #3690 NEC-P07 **Final Action: Reject**
(320.30)

Submitter: George W. Flach, National Armored Cable Manufacturers Assn.
Comment on Proposal No: 7-20
Recommendation: Reconsider the proposal and Accept in Part the portion of the proposal that that would change support requirements from 4 1/2 feet to 6 feet in 320.30 and 320.30(A) in the 2002 NEC.

320.30 Securing and Supporting. Type AC cable shall be secured by staples, cable ties, straps, hangers, or similar fittings designed and installed so as not to damage the cable at intervals not exceeding 1.8 m (6 ft) ~~1.4 m (41/2 ft)~~ and within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting.

(A) Horizontal Runs Through Holes and Notches. In other than vertical runs, cables installed in accordance with 300.4 shall be considered supported and secured where such support does not exceed 1.8 m (6 ft) ~~1.4 m (41/2 ft)~~ intervals and the armored cable is securely fastened in place by an approved means within 300 mm (12 in.) of each box, cabinet, conduit body, or other armored cable termination.

Substantiation: The distance for supporting and securing AC should be changed to 6 feet the same as MC based on construction and performance similarities. The UL prescribed mechanical performance requirement that relate to supporting and securing for AC equals or exceeds those of MC. The armor of MC cable is required to support a 150-pound weight without the armor opening. AC must support a 300-pound weight without the armor opening up. Type AC must additionally support a 100-pound weight without elongating the armor more than 3-inches.
Panel Meeting Action: Reject
Panel Statement: The armour assembly of AC cable forms the equipment grounding conductor that should not be compromised. Substantiation has not been provided that evaluates the grounding performance of the cable, given the change in supporting requirements to 6 feet.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-23 Log #2089 NEC-P07 **Final Action: Reject**
(320.80(B)(3))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-22
Recommendation: The proposal should be rejected.
Substantiation: Thermal insulation severely degrades the ampacity of conductors. Mid-length conductor derating, whether as a consequence of the ambient temperature notes to Table 310.16, etc., or mutual conductor heating issues covered in 310.15(B)(2)(a), assumes free dissipation of heat from the raceway or cable assembly involved. If that assumption is invalid, then the calculations are invalid. This is true for all wiring methods.

For example, refer to the substantiation for this submitter's comment on Proposal 7-188. From that experimental data, it is obvious that the true ampacity of 2 AWG XHHW Aluminum made up as Type SE cable is about 60 amperes when it is embedded in cellulose insulation. In fact, the ampacity is probably even lower because the test set-up used only two current-carrying conductors and comparable table listings are based on three conductors. The table ampacity of the individual conductors in the 60°C column is 75 amperes. This is much higher than the actual ampacity as determined by test under the specified conditions of use.

If the proposal is accepted, code users will start their derating calculations in the 90°C column, and bundle many conductors together or run through high-temperature ambients, all apparently valid according to traditional procedures. Suppose, for example, cables accounting for nine 12 AWG current-carrying conductors are bundled through attic floor joists with an assigned design temperature of 45°C. The resulting ampacity (assuming THHN conductors) would appear to be 30A x 0.7 x 0.87 = 18A. The 60°C ampacity of 12 AWG conductors is 25A. Since the calculation result (18A) does not exceed 25A, it must be OK, right?

Wrong. This calculation completely ignores the effect of thermal insulation. The more technically correct answer is given by the existing 2002 NEC: Begin with the 60°C column: 25A x 0.7 x 0.71 = 12A. There is no consistent percent multiplier that can be applied to correct for thermal insulation. Because heat dissipation has to account for I2R losses, which are usually much higher for larger cables expected to carry much more current, one can't confidently predict the exact ampacity of a given application. However, one can predict with confidence that the thermal insulation effect will be significant. The 60°C rule provides a prescriptive approximation of how to counteract the effects of thermal insulation. It probably overstates the result in the smallest sizes of conductors, and understates it in the larger sizes, but it is the only game in town. If this proposal passes, we will only be left with 310.10, a rule that very few installers and inspectors know how to implement effectively. Acceptance of this proposal will create a grave safety hazard.
Panel Meeting Action: Reject
Panel Statement: The panel affirms its postion that the added sentence brings this section into harmomy with 334.80 on ampacity derating of Type NM cable.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 322 — FLAT CABLE ASSEMBLIES: TYPE FC

7-24 Log #2063 NEC-P07 **Final Action: Reject**
(322.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-24
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.

The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-8.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-25 Log #907 NEC-P07 **Final Action: Accept**
(322.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-25
Recommendation: Reinstate the deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 322.10 in the 2002 NEC.
Substantiation: See my comment on Article 320 Proposal 7-8.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-26 Log #961 NEC-P07 **Final Action: Accept**
(322.10)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-25
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-27 Log #2095 NEC-P07 **Final Action: Accept**
(322.10)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-25
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-28 Log #2437 NEC-P07 **Final Action: Accept**
(322.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-25
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"322.10 Uses Permitted.
Flat cable assemblies shall be permitted only as follows:
(1) As branch circuits to supply suitable tap devices for lighting, small appliance, or small power loads. The rating of the branch circuit shall not exceed 30 amperes.
(2) Where installed for exposed work.
(3) In locations where they will not be subjected to physical damage. Where a flat cable assembly is installed less than 2.5 m (8 ft) above the floor or fixed working platform, it shall be protected by a cover identified for the use.
(4) In surface metal raceways identified for the use. The channel portion of the surface metal raceway systems shall be installed as complete systems before the flat cable assemblies a pulled into the raceways."
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-29 Log #2096 NEC-P07 **Final Action: Accept in Principle in Part**
(322.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-27
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle in Part

The panel does not accept inclusion of the words "as follows". The remainder of the comment is accepted.
Panel Statement: See panel action on Proposal 7-26.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-30 Log #2436 NEC-P07 **Final Action: Reject**
(322.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-26
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"324.12 Uses Not Permitted.

Flat cable assemblies shall not be used as follows:

(1) Where subject to corrosive vapors unless suitable for the application
(2) In hoistways or on elevators or escalators
(3) In any hazardous (classified) location
(4) Outdoors or in wet or damp locations unless identified for the use"

Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-29.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 324 — FLAT CONDUCTOR CABLE: TYPE FCC

7-32 Log #485 NEC-P07 **Final Action: Accept**
(324)

Submitter: James T. Dollard, Jr., IBEW Local 98
Comment on Proposal No: 7-30
Recommendation: Continue to reject proposal 7-30.
Substantiation: This comment is the work of a task group assigned to address the request of Code-Making Panel 7 and the Technical Correlating Committee for comment from Code-Making Panel 10 on proposal 7-30. The task group consisted of the following members of Code-Making Panel 10: Charlie Blizard, Dennis Darling, Carl Fredericks, Clive Kimblin, George Ockuly, Gerry Williams, John Zaplatosch, Rich Lofton, Vince Saporita and Jim Dollard. After significant review and deliberation, the task group recommends that the proposal continue to be rejected. Code-Making Panel 10 agrees with the panel statement and action to reject proposal 7-30. Regarding the overcurrent protection aspects of this proposal, test results or other evidence were not provided to substantiate the effectiveness of the overcurrent measures proposed vs. the concerns cited in the substantiation. Also, no evidence was supplied to substantiate equal or improved performance in overcurrent or fire safety for installations that would be covered vs. present acceptable wiring methods for the same applications. It is recommended that the submitter obtain a Fact Finding Report to determine the possible safety issues associated with FCC cable located on the interior surfaces of walls and ceilings. In particular, the Fact Finding Report should include a study of the ASD's ability to address those issues. While AFCI and GFCI related portions of this proposal may be in the purview of other panels, the branch circuit aspects of this proposal would be within the purview of Code-Making Panel 10.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-33 Log #3666 NEC-P07 **Final Action: Hold**
(324 and 382)

Submitter: Robert J. Sexton, De Corp Americas Inc.
Comment on Proposal No: 7-30
Recommendation: DeCorp Americas, Inc., considering Panel 7 comments and in consultation with Underwriters Laboratories, has made dramatic improvements in AC FlatWire design since Proposal 7-30-(324) was submitted. The revised wire design has a layered construction (see Substantiation for additional description). This construction creates an inherently safe wire and wiring method when protected by a standard circuit breaker or other standard circuit protection.

The panel statement on Proposal 7-30-(324) commented that installation on walls and ceilings was not in the intended scope of Article 324. Considering the revised wire design and the panel comments and in consultation with representatives of Underwriters Laboratories, DeCorp believes that FlatWire wiring technology better fits within the scope of Article 382. As a result, DeCorp, as submitter, proposes to transition from Article 234 and modify Article 382 rather than Article 324.

The panel statement also commented that the electronic circuit protection features in the proposal would need to be reviewed by Panel 10. The revised FlatWire wiring technology eliminates the need for an Active Safety Device as originally proposed. Therefore, the Active Safety Device has been removed from the proposal, and a review by Panel 10 will not be necessary.

Proposed revisions to Article 382 are as follows:

Revise 382.1 as follows:

382.1 Definition.

Nonmetallic Extension. An assembly of ~~two~~ insulated conductors within a nonmetallic jacket of ~~an extruded~~ thermoplastic covering. The classification

includes surface extensions intended for mounting directly on the surface of walls or ceilings.

Revise 382.10 as follows:

382.10 Uses Permitted. Nonmetallic extensions shall be permitted only where all the conditions in 382.10(A), (B), and (C) are met.

(A) From an Existing Outlet. The extension is from an existing outlet on a 15- or 20-ampere branch circuit.

(B) Exposed and in a Dry Location. The extension is run exposed and in a dry location.

Exception: Extensions with an earthed metal shield or a grounding conductor covering the ungrounded conductor(s) may be blended into the surface by plaster finish, finishing compound, paint, or similar methods.

(C) Residential or Offices. For nonmetallic surface extensions mounted directly on the surface of walls or ceilings, the building is occupied for residential or office purposes and does not exceed three floors above grade.

FPN No. 1: See 310.10 for temperature limitation of conductors.

FPN No. 2: See 362.10 for definition of first floor.

Revise 382.30 as follows:

382.30 Securing and Supporting. Nonmetallic surface extensions shall be secured in place by approved means at intervals not exceeding 200 mm (8 in.), with an allowance for 300 mm (12 in.) to the first fastening where the connection to the supplying outlet is by means of an attachment plug. There shall be at least one fastening between each two adjacent outlets supplied. An extension shall be attached to ~~only~~ woodwork, ~~or~~ plaster finish, gypsum wallboard, masonry, or similar building surfaces and shall not be in contact with any metal work or other conductive materials other than with metal plates on receptacles.

Substantiation: DeCorp Americas, Inc., has made dramatic improvements in AC FlatWire design since Proposal 7-30-(324) was submitted. The revised wire design is inherently safe when protected by a standard circuit breaker. Any puncture of the wire results in the circuit breaker tripping. This eliminates the need for an Active Safety Device (enhanced GFCI) as originally proposed.

The revised wire design is a multi-layer design> the design consists of layers of insulation and flat conductors with the following configuration:————————————————-Insulation————————————————-
flat grounding conductor (ground)
————————————————-Insulation————————————————-
flat grounded conductor (neutral)
————————————————-Insulation————————————————-
flat ungrounded conductor (hot)
————————————————-Insulation————————————————-
flat grounding conductor (neutral)
————————————————-Insulation————————————————-
flat grounding conductor (ground)
————————————————-Insulation————————————————-
Connector for the FlatWire tie the grounded (neutral) connectors together and tie the grounding (ground) connectors together at each end of a run of wire.

Rationale or Changes to Article 382:

382.1 Definition – The FlatWire design has, when connected, the equivalent of two current carrying conductors meeting the intent of the definition. The word "two" should be removed from the definition to avoid varying interpretations and provide maximum design flexibility under this article. This wording was most likely put in place before grounding conductors were required. The word "extruded" should also be removed to allow maximum design flexibility.

382.10 Uses Permitted – The FlatWire design protects the ungrounded (hot) conductor with both the grounded (neutral) conductor and the grounding (ground) conductor. This enhances the level of inherent safety well beyond conventional two or three wire cables. The protection from electrical shock is comparable to Type MC Cable. This high level of safety should allow constructions of this type to be blended into the surface of walls and ceilings by plaster finish or similar methods.

382.30 Securing and Supporting – The intent of this section appears to be to allow installation on interior non-conducting surfaces. Additional building surface materials should be added to reflect modern construction techniques.

Additional Discussion of FlatWire and the Proposed Changes to Article 382.

FlatWire's extremely flat profile differentiates it visually from conventional wire and cable; whereas, the layered construction of FlatWire differentiates it in terms of safety from conventional wire and cable. These two aspects, flat profile and enhanced safety, provide opportunities and advantages not available with conventional wire and cable.

FlatWire's flat profile makes it possible for it to be easily installed using adhesive to the interior surfaces of buildings. This basic installation method meets the requirements of Article 382. The flat profile also creates the opportunity for FlatWire to be painted to match the wall or ceiling. This aesthetic enhancement also remains within the requirements of Article 382. The flat profile further makes it possible to cover the FlatWire with finishing compound prior to painting. This makes FlatWire an appealing method for providing power to devices without destruction of interior surfaces or the use of unsightly and unsafe extension cords. DeCorp proposes that Article 382 be changed to clearly allow the use of finishing compound to blend FlatWire (or similar constructions) into the surface of the wall or ceiling.

The proposed change to Article 382 allows cables to be blended into the wall or ceiling surface if the hot conductor is protected by an earthed metal shield or a grounding conductor. FlatWire is constructed such that the hot conductor is covered by both the neutral conductor and the ground conductor. This construction provides a level of safety far exceeding conventional unshielded cables. In fact, the protection from electrical shock provided by this construction is most comparable to metal-clad cable. It is the FlatWire's high level of safety that makes it suitable for it to be covered by finishing compound on walls and ceilings.

Covering FlatWire with finishing compound provides several safety related attributes. The finishing compound encloses the FlatWire in nonflammable material. The FlatWire does not propagate flame due to the insulating material and the large heat dissipating copper surfaces. Covering it with finishing compound further enhances the fire safety.

Finishing compound provides additional protection from physical damage to the FlatWire. FlatWire is very resistant to damage other than direct penetration. Although, the outer insulation is relatively thin, the first layer of copper is the safe grounding layer and is very resistant to abrasive type of abuse. Additionally, the flat copper conductors cannot be additionally thinned by impact in the way that round conductors may be. Covering the FlatWire with finishing compound provides an additional safety barrier to physical abuse. This is further enhanced when fiberglass mesh drywall tape is used over the FlatWire prior to applying the finishing compound.

Blending FlatWire into the wall surface with finishing compound removes the visual temptation for children to play with it. Conventional wisdom says that it is better for cables and cords to be visible so that a person will avoid penetrating them with an object such as a nail. However, this logic does not apply to small children or pets, which are attracted to what they can see; including cables and cords. Covering the FlatWire with finishing compound removes the visual attraction for a child or pet making it less likely that they will damage the FlatWire.

FlatWire Application Note.

FlatWire will be provided with connections and terminations Listed to applicable standards. FlatWire will be supplied from an existing outlet on a branch circuit. A FlatWire source connector will plug into an existing receptacle to supply the FlatWire. The FlatWire will be terminated with a connector and receptacles appropriate for the application. Initial FlatWire products will be supplied by a single receptacle and provide a single receptacle at the termination. Later products may allow provide multiple receptacles similar to standard current taps or special purpose terminations for specific device applications.

FlatWire Testing.

DeCorp is working with Underwriters Laboratories to develop a comprehensive test program for FlatWire. The goal of this test program is to demonstrate the safety of the FlatWire and lead to Listing. This test program will address all of the relevant safety issues as they apply to FlatWire and Article 382.

DeCorp believes that FlatWire systems meet the conceptual requirements of Article 382 and may be Listed without changes to Article 382. The proposed changes to Article 382 are for clarification and to clearly allow FlatWire to be blended into the surface of a wall or ceiling using various methods including the use of finishing compound.

DeCorp is continuing internal testing of FlatWire. I have submitted a test report on the initial penetration testing performed on prototype FlatWire.

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

Panel Meeting Action: Hold

Only the comment is held. The proposal goes forward.

Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

In addition, the panel recommends that this material become a proposal to Code-Making Panel 6, also relative to the parallel conductors and ampacity.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-34 Log #2036 NEC-P07 **Final Action: Accept**
(324.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-32
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.

The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI

Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.

7-34a Log #CC702 NEC-P07 **Final Action: Accept**
(324.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-34
Recommendation: Reinstate the text in 324.10 as follows: "324.10 Uses Permitted.
(A) Branch Circuits. Use of FCC systems shall be permitted both for general-purpose and appliance branch circuits and for individual branch circuits.
(B) Branch-Circuit Ratings.
(1) Voltage. Voltage between ungrounded conductors shall not exceed 300 volts. Voltage between ungrounded conductors and the grounded conductor shall not exceed 150 volts.
(2) Current. General-purpose and appliance branch circuits shall have ratings not exceeding 20 amperes. Individual branch circuits shall have ratings not exceeding 30 amperes.
(C) Floors. Use of FCC systems shall be permitted on hard, sound, smooth, continuous floor surfaces made of concrete, ceramic, or composition flooring, wood, and similar materials.
(D) Walls. Use of FCC systems shall be permitted on wall surfaces in surface metal raceways.
(E) Damp Locations. Use of FCC systems in damp locations shall be permitted.
(F) Heated Floors. Materials used for floors heated in excess of 30°C (86°F) shall be identified as suitable for use at these temperatures.
(G) System Height. Any portion of an FCC system with a height above floor level exceeding 2.3 mm (0.090 in.) shall be tapered or feathered at the edges to floor level.
(H) Coverings. Floor-mounted Type FCC cable, cable connectors, and insulating ends shall be covered with carpet squares not larger than 914 mm (36 in.) square. Those carpet squares that are adhered to the floor shall be attached with release-type adhesives.
(I) Corrosion Resistance. Metal components of the system shall be either corrosion resistant, coated with corrosion-resistant materials, or insulated from contact with corrosive substances.
(J) Metal-Shield Connectors. Metal shields shall be connected to each other and to boxes, receptacle housings, self-contained devices, and transition assemblies using metal-shield connectors."
Substantiation: Based on the action on Proposal 7-34, 324.10 was moved into 324.12. Based on the acceptance of Comment 7-35, the text as it presently exists in 324.10 is being reinstated.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:
SCHUMACHER: See of Explanation of Affirmative Vote on Comment 7-14a.

7-35 Log #2097 NEC-P07 **Final Action: Accept**
(324.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-34
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.
When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.
The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-36 Log #2435 NEC-P07 **Final Action: Accept**
(324.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-34
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"324.12 Uses Not Permitted.
FCC systems shall not be used:
(1) Outdoors or in wet locations
(2) Where subject to corrosive vapors
(3) In any hazardous (classified) location
(4) In residential, school, and hospital buildings"
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

(Note: The sequence no. 7-37 was not used)

12-3b Log #380 NEC-P12 **Final Action: Reject**
(324.23(E))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 12-11
Recommendation: Accept in principle, revise if necessary.
Substantiation: The substantiation is correct and the proposal provides for what is a very common installation. Widely accepted as practical. It is difficult to thread two or more conduits into one side of a box, and many times this is only accomplished when one or more conduit connections at the box is a nipple which is then connected by a threadless coupling to the extended conduit, which is essentially what is proposed, but literally complies with the present requirement. A requirement that is widely disregarded should be revised.
Panel Meeting Action: Reject
Panel Statement: There is no indication that this relates to any proposal under the jurisdiction of CMP 12.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

ARTICLE 326 — INTEGRATED GAS SPACER CABLE: TYPE IGS

7-38 Log #2067 NEC-P07 **Final Action: Reject**
(326.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-43
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.

The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Reject
Panel Statement: Type IGS cable has very limited applications. It is only used under engineering supervision. No product standard exists, since there is only one manufacturer.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 11 Negative: 3
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-39 Log #908 NEC-P07 **Final Action: Accept**
(326.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-44
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 326.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-40 Log #962 NEC-P07 **Final Action: Accept**
(326.10)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-44
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-41 Log #2098 NEC-P07 **Final Action: Accept**
(326.10)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-44
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-42 Log #2434 NEC-P07 **Final Action: Accept**
(326.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-44
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"326.10 Uses Permitted.
Type IGS cable shall be permitted for use under ground, including direct burial in the earth, as the following:
(1) Service -entrance conductors
(2) Feeder or branch-circuit conductors"
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-43 Log #3127 NEC-P07 **Final Action: Accept**
(326.10)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-44
Recommendation: The proposal should be rejected.
Substantiation: We recognize the considerable effort put forth by the task group charged with integrating uses permitted/not permitted, but feel this change accepted by CMP 7, in conjunction with the action on proposal 7-8, negatively impacts usability. Additionally, we have concerns that not all of the changes are merely editorial in nature and without change in application. This Comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-44 Log #2099 NEC-P07 **Final Action: Accept**
(326.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-45
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-45 Log #2444 NEC-P07 **Final Action: Accept**
(326.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-45
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"326.12 Uses Not Permitted.

Type IGS cable shall not be used as interior wiring or be exposed in contact with buildings."
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-46 Log #3126 NEC-P07 **Final Action: Accept**
(326.12)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-45
Recommendation: The proposal should be rejected.
Substantiation: We recognize the considerable effort put forth by the task group charged with integrating uses permitted/not permitted,but feel this change accepted by CMP 7, in conjunction with the action on proposal 7-8, negatively impacts usability. Additionally, we have concerns that not all of the changes are merely editorial in nature and without change in application. This Comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 328 — MEDIUM VOLTAGE CABLE: TYPE MV

7-47 Log #2037 NEC-P07 **Final Action: Reject**
(328.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-47
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.

The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-8.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:

BROWN: See my explanation of negative vote on Comment 7-8.

CANGEMI: See my explanation of negative vote on Comment 7-8.

SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.

STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-48 Log #909 NEC-P07 **Final Action: Accept in Part**
(328.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-49
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 328.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Part

The panel does not accept the words "as follows." In 328.10(3), change 392.3(B)(1) to 392.3(B)(2). The remainder of the comment is accepted.

Panel Statement: See panel action and statement on Committee Comment 7-51a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-49 Log #963 NEC-P07 **Final Action: Accept in Principle**
(328.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-49 to "Reject" Proposal 7-49 and that the action on Comment 7-51a includes the accepted wording for 328.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-49
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-51a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-50 Log #2100 NEC-P07 **Final Action: Accept in Principle**
(328.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-50 to "Reject" Proposal 7-49 and that the action on Comment 7-51a includes the accepted wording for 328.10.
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-49
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-51a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-51 Log #2443 NEC-P07 **Final Action: Accept in Principle**
(328.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-49
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"328.10 Uses Permitted.

Type MV cable shall be permitted for use on power systems rated up to 35,000 volts, nominal, as follows:

(1) In wet or dry locations
(2) In raceways
(3) In cable trays as specified in 392.3(B)(1)
(4) Direct buried in accordance with 300.50
(5) In messenger-supported wiring"

Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-51a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-51a Log #CC703 NEC-P07 **Final Action: Accept**
(328.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-49
Recommendation: Reinstate the text for 328.10 as follows: "328.10 Uses Permitted.

Type MV cable shall be permitted for use on power systems rated up to 35,000 volts nominal as shown below, and in other locations and conditions not prohibited by 328.12 or elsewhere in the Code:

(1) In wet or dry locations
(2) In raceways
(3) In cable trays as specified in 392.3(B)(2)
(4) Direct buried in accordance with 300.50
(5) In messenger-supported wiring".

FPN: The "Uses Permitted" is not an all-inclusive list."
Substantiation: The deletion of 328.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness while making it clear that the list of "Uses Permitted" is not an all-inclusive list. The panel actions on Proposals 7-48, 7-49, and 7-50 were incorporated into the revised text.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:

DALY: NEMA does not find it appropriate to add the phrase "and in other locations and conditions not prohibited by 328.12 or elsewhere in the Code", and it should be deleted. NEMA considers this phrase to be new material, and is particularly concerned with the impact this could have on specialized Articles without having had appropriate review by other panels and other interested parties.

SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-52 Log #2090 NEC-P07 **Final Action: Hold**
(328.12)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-52
Recommendation: Accept the proposal in principle. In (2), revise the wording to say: "(2) In cable trays, unless installed in accordance with 392.3(B)" Add a new (4) as follows: "(4) As exposed wiring outside of raceways, or cable trays where permitted by 392.3(B), unless in an area accessible to qualified persons only".
Substantiation: 392.3(B)(2) does not "specify" Type MV cable. The bottom line is that MV cable is only installable in cable trays under the conditions given in 392.3(B) in their entirety. This includes the industrial occupancy and qualified supervision provisions in the parent rule, and then the specific mention of Type MV cable. Even that provision [392.3(B)(2)] sends the reader back to 392.3(B)(1) that has the rest of the requirements. The reference will be misleading unless it points to all of 392.3(B).
The second change correlates the traditional permission for this wiring method [former 328.10(2)] with the rule in 300.37. NEC users should not assume that the outcome of Proposal 7-52 means that now Type MV cable is eligible for unprotected use in areas accessible to the public. This issue was addressed in comparable Proposal 7-172 for tray cable at 336.12(8) and this wiring method should carry a similar restriction.
Panel Meeting Action: Hold
The panel holds the comment only.
Panel Statement: The recommended item (4) introduces new material that has not had public review.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-53 Log #2103 NEC-P07 **Final Action: Accept in Part**
(328.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-52
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.
When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.
The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Part
The panel does not accept inclusion of the words "as follows"but accepts the remainder of the comment.
Panel Statement: See panel action and statement on Committee Comment 7-54a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-54 Log #2442 NEC-P07 **Final Action: Accept in Part**
(328.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-52
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"328.12 Uses Not Permitted.
Type MV cable shall not be used unless identified for the use as follows:
(1) Where exposed to direct sunlight
(2) In cable trays"
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Part
The panel does not accept inclusion of the words "as follows" but accepts the remainder of the comment.
Panel Statement: See panel action and statement on Committee Comment 7-54a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-54a Log #CC704 NEC-P07 **Final Action: Accept**
(328.12)

Note: The Technical Correlating Committee directs that the words "as follows" be deleted to be consistent with the action on Comment 7-54.
Submitter: Code-Making Panel 7
Comment on Proposal No: 7-52
Recommendation: Reinstate 328.12 Uses Not Permitted to read as follows:
"Unless identified for the use, Type MV cable shall not be used as follows:
(1) Where exposed to direct sunlight
(2) In cable trays, unless specified in 392.3(B)(2)
(3) Direct buried, unless in accordance with 300.50".
Substantiation: The panel action on this panel comment will correlate with the panel action on Committee Comment 703, which added the "Uses Permitted" back into the Code. The panel actions on the following proposals were incorporated into the Committee Comment: 7-51 and 7-53.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 330 — METAL-CLAD CABLE, TYPE MC

7-55 Log #2069 NEC-P07 **Final Action: Reject**
(330.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-54
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.
The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-8.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-56 Log #910 NEC-P07 **Final Action: Accept in Principle**
(330.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-55
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 330.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-60a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-57 Log #964 NEC-P07 **Final Action: Accept in Principle**
(330.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-57 to "Reject" Proposal 7-55 and that action on Comment 7-60a includes the accepted wording for 330.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-55
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code and that proposed wording in 336.12(3) (A) through (F) be deleted and the wording in 336.10(6) in the 2002 NEC remain in "Uses Permitted".
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-60a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-58 Log #2106 NEC-P07 **Final Action: Accept in Principle**
(330.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-57 to "Reject" Proposal 7-55 and that action on Comment 7-60a includes the accepted wording for 330.10.
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-55
Recommendation: Reject proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-60a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-59 Log #2420 NEC-P07 **Final Action: Accept in Principle in Part**
(330.10)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 7-55
Recommendation: Revise the existing text of the 2002 NEC as follows:
330.10 Uses Permitted. Type MC cable shall be permitted to be used in all buildings, structures, and locations unless prohibited or restricted by 330.12 or by other articles of this Code.
Substantiation: Deletion of the list of uses permitted may, in ways, be more user-friendly but we believe unless the above language is added it will create confusion and issues of differing interpretation and application of the Code. Having only a Section 330.12 that lists the uses not permitted still leaves open the question of, "What uses are permitted?"

The text proposed by this Comment clearly states the permitted uses and furthers the usability of the Code, which is the substantiation for the original proposal.
Panel Meeting Action: Accept in Principle in Part

The panel does not accept the words "to be used in all buildings, structures, and locations unless" and "or restricted," and the remainder of the recommended wording is Accepted in Principle.
Panel Statement: See panel action and statement on Committee Comment 7-60a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-60 Log #2441 NEC-P07
Final Action: Accept in Principle
(330.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-55
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"330.10 Uses Permitted.
(A) General Uses. Where not subject to physical damage, Type MC cables shall be permitted as follows:
(1) For services, feeders, and branch circuits
(2) For power, lighting, control, and signal circuits
(3) Indoors or outdoors
(4) Where exposed or concealed
(5) Direct buried where identified for such use
(6) In cable tray
(7) In any raceway
(8) As open runs of cable
(9) As aerial cable on a messenger
(10) In hazardous (classified) locations as permitted in Articles 501, 502, 503, 504 and 505
(11) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet location.
(12) In wet locations where any of the following conditions are met:
a. The metallic covering is impervious to moisture.
b. A lead sheath or moisture-impervious jacket is provided under the metal covering.
c. The insulated conductors under the metallic covering are listed for use in wet locations.
(13) Where single-conductor cables are used, all phase conductors and, where used, the neutral conductor shall be grouped together to minimize induced voltage on the sheath.
(B) Specific Uses. Type MC cable shall be installed in compliance with Articles 300, 490, 725 and 770-523 as applicable and in accordance with 330.10(B)(1) through (B)(4).
(1) Cable Tray. Type MC cable installed in cable tray shall comply with Article 392.
(2) Direct Buried. Direct-buried cable shall comply with 300.5 or 300.60 as appropriate.
(3) Installed as Service-Entrance Cable. Type MC cable installed as service-entrance cable shall comply with Article 230.

(4) Installed Outside of Buildings or as Aerial Cable. Type MC cable installed outside of buildings or as aerial cable shall comply with Article 225 and Article 396."

Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Committee Comment 7-60a.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-60a Log #CC705 NEC-P07 **Final Action: Accept**
(330.10)

Submitter: Code-Making Panel 7

Comment on Proposal No: 7-55

Recommendation: Reinstate 330.10 to read as follows: "330.10 Uses Permitted.

(A) General Uses. Type MC cable shall be permitted as follows and in other locations and conditions not prohibited by 330.12 or elsewhere in the Code:

(1) For services, feeders, and branch circuits.
(2) For power, lighting, control, and signal circuits
(3) Indoors or outdoors
(4) Exposed or concealed
(5) To be direct buried where identified for such use
(6) In cable tray where identified for such use
(7) In any raceway
(8) As aerial cable on a messenger
(9) In hazardous (classified) locations as permitted
(10) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations
(11) In wet locations where any of the following conditions are met:
a. The metallic covering is impervious to moisture
b. A lead sheath or moisture-impervious jacket is provided under the metal covering.
c. The insulated conductors under the metallic covering are listed for use in wet locations.
(12) Where single-conductor cables are used, all phase conductors and, where used, the neutral conductor shall be grouped together to minimize induced voltage on the sheath.

(B) Specific Uses. Type MC cable shall be permitted to be installed in compliance with Parts II and III of Article 725 and 770.52 as applicable and in accordance with 330.10(B)(1) through (B)(4).

(1) Cable Tray. Type MC cable installed in cable tray shall comply with 392.3, 392.4, 392.6, and 392.8 through 392.13.

(2) Direct Buried. Direct-buried cable shall comply with 300.5 or 300.50, as appropriate.

(3) Installed as Service-Entrance Cable. Type MC cable installed as service-entrance cable shall be permitted in accordance with 230.43.

(4) Installed Outside of Buildings or as Aerial Cable. Type MC cable installed outside of buildings or as aerial cable shall comply with 225.10, 396.10, and 396.12.

FPN: The "Uses Permitted" is not an all-inclusive list."

Substantiation: The deletion of 330.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness while making it clear that the list of "Uses Permitted" is not an all-inclusive list. The panel actions on Proposals 7-56, 7-57, 7-58, 7-59, 7-60, 7-61, 7-62, and 7-63 were incorporated into the revised text.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

Comment on Affirmative:

DALY: NEMA does not find it appropriate to add the phrase "and in other locations and conditions not prohibited by 330.12 or elsewhere in the Code", and it should be deleted. NEMA considers this phrase to be new material, and is particularly concerned with the impact this could have on specialized Articles without having had appropriate review by other panels and other interested parties.

SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-61 Log #2040 NEC-P07 **Final Action: Accept in Part**
(330.12)

Submitter: Patricia B. Horton, LCP Consulting

Comment on Proposal No: 7-64

Recommendation: If this proposal continues to be accepted (in principal) as revised by the CMP, add the following to complete bringing caveats in Uses Permitted into Uses Not Permitted.

• 330.12(2)(b) Change "exposed" to "subject to…"
• Add a number 6 to the list:
"In 300.22(B) applications unless it has a smooth or corrugated impervious metal sheath without an overall nonmetallic covering."
• Add a new number 7:
"In hazardous locations unless permitted elsewhere in the code."

Substantiation: These changes need to be included if the concept of permitting use unless it is expressly not permitted goes forward. (I do not agree with changing to that concept but feel compelled to comment in case it does.)

• The term "exposed" as defined in the NEC for wiring methods is inappropriate in this section.
• It is important to indicate that not all types of MC cable are permitted in 300.22(B) spaces.
• It is important to assure that users have to check Chapter 5 for permitted uses in hazardous locations as such use is limited. All sections applicable are too numerous to detail, and the Style Manual does not permit article references.

Panel Meeting Action: Accept in Part

Revise the wording in the comment to read as follows:The panel accepts changing "exposed" to "subject to..." in 330.12(2)(b). The panel does not accept the addition of a new (6) and (7).

Panel Statement: The suggested new number (6) is already identified in 300.22(B) and 330.116, and number (7) is already covered in 330.10(A)(10).

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-62 Log #2107 NEC-P07 **Final Action: Accept in Part**
(330.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America

Comment on Proposal No: 7-64

Recommendation: Reject this proposal.

Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.

Panel Meeting Action: Accept in Part

The panel retains the fine print note as shown in Proposal 7-64; however, the FPN will pertain to (2), and the panel accepts the remainder of the comment.

Panel Statement: Retaining the fine print note provides clarity to the requirements for encasement in concrete.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-63 Log #2440 NEC-P07 **Final Action: Accept in Part**
(330.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-64
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"330.12 Uses Not Permitted.

Type MC cable shall not be used where exposed to the following destructive corrosive conditions, unless the metallic sheath is suitable for the conditions or is protected by material suitable for the conditions:

(1) Direct burial in the earth
(2) In concrete
(3) Where exposed to cinder fills, strong chlorides, caustic alkalis, or vapors of chlorine or of hydrochloric acids"

Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept in Part

Panel Statement: See panel action and statement on Comment 7-62.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-64 Log #3675 NEC-P07 **Final Action: Accept in Principle**
(330.12, FPN)

Submitter: George Straniero, AFC Cable Systems
Comment on Proposal No: 7-64
Recommendation: The FPN should be revised as follows:
FPN to ~~(3)~~ (4): MC Cable that is identified for direct burial applications is suitable for installation in concrete.

Substantiation: The FPN is incorrectly referenced to (3) of 330.12. The FPN reference should be to (4) which addresses MC installed in concrete.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 7-62.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-65 Log #2421 NEC-P07 **Final Action: Accept in Part**
(330.12(1))

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 7-64
Recommendation: Revise the proposed text of the 2002 NEC ROP Draft as follows:

330.12 Uses Not Permitted. Type MC cable shall not be permitted under the following conditions or in the following locations:

(1) Where subject to physical damage unless provided with suitable protection against physical damage by means such as construction methods, running boards, guard strips, elevation or isolation.

Substantiation: Within the context of the new format of specifying only "not permitted uses", simply stating that the cable shall not be used where subject to physical damage can be interpreted to mean that the cable could not be used even if protection was provided such as with a sleeve or being inaccessible based on distance or location such as 330.17 or 330.23.

Panel Meeting Action: Accept in Part

Revise the wording in the comment to read as follows:"(1) Where subject to physical damage." The panel understands that the numbering of the list will be revised accordingly.

Panel Statement: The panel does not accept the remainder of the suggested wording in (1) because once the cable is protected, it is no longer subject to physical damage. Adding information on how to protect from physical damage is not necessary.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-66 Log #2071 NEC-P07 **Final Action: Reject**
(330.17)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-67
Recommendation: Reject this proposal.
Substantiation: The CMP has consistently rejected requiring a listing for MC Cable. The substantiation states "Listed Type MC Cable provides excellent protection". Without a requirement for listing, which requires compliance with a listing standard and third party certification, the proposal has not been justified. What if unlisted MC cable were used? Would that provide "excellent protection"?

Panel Meeting Action: Reject

Panel Statement: The panel action on Proposal 7-65 addressed the parts of 300.4 that are necessary to protect MC cable against physical damage. Authorities having jurisdiction use listings as one means of determining if the wiring method is suitable for the application.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:

CANGEMI: See my explanation of negative vote on Comment 7-8.

7-67 Log #2422 NEC-P07 **Final Action: Accept**
(330.30)

Submitter: J. Philip Simmons, Simmons Electrical Services / Rep. National Armored Cable Manufacturers Association
Comment on Proposal No: 7-73
Recommendation: Revise existing Section 330.30 from the 2005 NEC ROP Draft as follows:

330.30 Securing and Supporting.

(A) General. Type MC cable shall be supported and secured by staples, cable ties, straps, hangers, or similar fittings or other approved means, designed and installed so as not to damage the cable, ~~at intervals not exceeding 1.8m (6 ft). Cables containing four or fewer conductors sized to larger than 10 AWG shall be secured within 300 mm (12 in.) of every box, cabinet, fitting, or other cable termination.~~

(B) Securing. Unless otherwise provided, cables shall be secured at intervals not exceeding 1.8 m (6 ft). Cables containing four or fewer conductors sized no larger than 10 AWG shall be secured within 300 mm (12 in.) of every box, cabinet, fitting, or other cable termination.

(C) ~~(A)~~ Supporting. Unless otherwise provided, cables shall be supported at intervals not exceeding 1.8 m (6 ft).

(1) Horizontal Runs ~~Through Holes and Notches.~~ Cables installed in wooden or metal framing members or similar supporting means ~~In other than vertical runs, cables installed in accordance with 330.17~~ shall be considered supported ~~and secured~~ where such support does not exceed 1.8 m (6 ft) intervals.

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

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

(2) Is not more than 1.8m (6 ft) in length from the last point of cable support to the point of connection to ~~a~~ lummaire(s) [lighting fixtures(s)] or other ~~piece of~~ electrical equipment and the cable and point of connection are within an accessible ceiling.

For the purpose of this section, Type MC cable fittings shall be permitted as a means of cable support. [ROP 7-73]

If the proposed revisions are accepted, the section will read as follows:

330.30 Securing and Supporting.

(A) General. Type MC cable shall be supported and secured by staples, cable ties, straps, hangers, or similar fittings or other approved means, designed and installed so as not to damage the cable.

(B) Securing. Unless otherwise provided, cables shall be secured at intervals not exceeding 1.8 m (6 ft.). Cables containing four or fewer conductors sized no larger than 10 AWG shall be secured within 300 mm (12 in) of every box, cabinet, fitting, or other cable termination.

(C) Support. Unless otherwise provided, cables shall be supported at intervals not exceeding 1.8 m (6 ft.)

(1) Horizontal Runs. Cables installed in wooden or metal framing members or similar supporting means shall be considered supported where such support does not exceed 1.8 m (6 ft) intervals.

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

(1) Is fished between access points through concealed spaces in finished buildings or structures and supporting is impractical; or

(2) Is not more than 1.8 m (6 ft) in length from the last point of cable support to the point of connection to a luminaire (lighting fixture) or other piece of electrical equipment and the cable and point of connection are within an accessible ceiling. For the purpose of this section, Type MC cable fittings shall be permitted as a means of cable support.

Substantiation: We believe organizing the requirements in the above format will add clarity and uniform interpretation and application of the Code. We also believe that we have addressed the concerns expressed by the Panel in their Statement on Proposal 7-74 by removing the word "connector" from (A) and keeping the supporting distance at 6 ft.

The new subsection (A) General is proposed to give a title to the opening paragraph and include requirements here that apply generally.

This requirements for securing and supporting are separated into (B) and (C) as they are really two different issues. Someone used an analogy of a person and a car to illustrate securing and supporting. When the person sits on the car seat, they are supported by it. When the seat belt is fastened around them they are secured. In addition, cables are not secured every 6 ft. where they pass through holes in framing members as the present language in the opening paragraph requires (supported and secured...at intervals not exceeding 6 ft). This requirement should only apply where the cables are installed across or on framing members and not through them.

The words "Through Holes and Notches" is proposed to be deleted from the title of (C)(1) as the requirement should apply to installations in other locations such as in on racks or brackets.

The phrase "In other than vertical runs, cables installed in accordance with 330.17" is proposed to be deleted from (C)(1) as the title of the section is "Horizontal Runs" and the cable installation is required to comply with 330.17. Including the reference here is unnecessarily repetitious.

The words "or similar supporting means" are proposed to be added to (C)(1) as there are a lot of suitable and acceptable methods of supporting cables such as by strut, pipe racks and brackets. The words "in holes and notches" are proposed to be deleted as the rule should apply to all horizontal runs, not only where cables pass through holes and notches.

"Unless otherwise provided" is proposed to be added to (B) and (C) as the provisions for Unsupported Cables in (D) acts like an exception to the general requirement.

We are proposing the word luminaire become plural (luminaire(s) [lighting fixtures(s)]) and the words "piece of" be deleted in (B)(3) [(D)(3)] to clarify the subsection is not limited to connecting a single luminaire or piece of equipment.

Finally, these changes are primarily editorial and not substantive and no new concepts have been introduced that would require this Comment to be held for further study.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-68 Log #141 NEC-P07 **Final Action: Reject**
(330.30(B)(1))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 7-69
Recommendation: Accept new text as proposed.
Substantiation: The term, "crawlspace," in the original substantiation was not intended to add crawlspaces deep enough to permit installers not just access but the ability to move through them so as to enable securing cables. In very shallow under-building spaces supporting may be impracticable, and so qualify under this clause. The issue of moisture, etc., is addressed by 320.10(3), which 320.30(B)(1) does not override.
Panel Meeting Action: Reject
Panel Statement: The panel affirms its position that crawlspace, by definition, is accessible. The proposed wording does not enhance clarity. Additionally, the cable may be in contact with the earth and, thereby, subject to damp, wet, and corrosive conditions.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-69 Log #3492 NEC-P07 **Final Action: Reject**
(330.40)

Submitter: Frank Pologruto North Cape May, NJ
Comment on Proposal No: 7-77
Recommendation: I support this proposal.
Substantiation: 330.40 is short compared to 320.40 which explains the purpose of the fittings and clamps and boxes, which is more explanatory for that person who is reading this particular paragraph, especially the reference to 300.15.
Panel Meeting Action: Reject
Panel Statement: Fittings listed for use on MC cable incorporate the conductor protection, and a bushing is not required.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-70 Log #2558 NEC-P07 **Final Action: Accept in Part**
(330.108)

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 7-82
Recommendation: Revise as follows for clarity:
"Where MC cable is used for equipment grounding it shall comply with Section 250-118(11) and Section 250-122".
Substantiation: This revision specifies the actual sections of Article 250 that are needed to assure compliance. This clarification is necessary because of the variety of circumstances applicable to using MC cable as an adequate equipment grounding conductor. Section 250-118 clarifies the specific types of MC that can be "listed and identified" for grounding; Section 250-122 contains other important information and also reference 250-134(A), 250.4(A)(5) and 250.4(B)(4).
Panel Meeting Action: Accept in Part
In the recommendation, the panel does not accept the use of the word "Section" in two instances, and accepts the remainder of the recommended wording.
Panel Statement: To conform with the NEC Style Manual.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 332 — MINERAL-INSULATED, METAL-SHEATHED CABLE

7-71 Log #2041 NEC-P07 **Final Action: Reject**
(332.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-83
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.

The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.

Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-8.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-72 Log #911 NEC-P07 **Final Action: Accept in Principle**
(332.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-86
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 332.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on 7-75a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-73 Log #966 NEC-P07 **Final Action: Accept in Principle**
(332.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-73 to "Reject" Proposal 7-86 and that action on Comment 7-75a includes the accepted wording for 332.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-86
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-75a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-74 Log #2108 NEC-P07 **Final Action: Accept in Principle**
(332.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-74 to "Reject" Proposal 7-86 and that action on Comment 7-75a includes the accepted wording for 332.10.
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-86
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-75a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-75 Log #2439 NEC-P07 **Final Action: Accept in Principle**
(332.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-86
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"332.10 Uses Permitted.
Type MI cable shall be permitted as follows:
(1) For services, feeders, and branch circuits
(2) For power, lighting, control, and signal circuits
(3) In dry, wet, or continuously moist locations
(4) Indoors or outdoors
(5) Where exposed or concealed
(6) Embedded in plaster, concrete, fill, or other masonry, whether above or below grade
(7) In any hazardous (classified) location
(8) Where exposed to oil and gasoline
(9) Where exposed to corrosive conditions not deteriorating to its sheath
(10) In underground runs where suitably protected against physical damage and corrosive conditions"
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-75a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-75a Log #CC706 NEC-P07 **Final Action: Accept**
(332.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-86
Recommendation: Reinstate the following text: "332.10 Uses Permitted.
Type MI cable shall be permitted as follows and in other locations and conditions not prohibited by 332.12 or elsewhere in the Code:
(1) For services, feeders, and branch circuits

(2) For power, lighting, control, and signal circuits
(3) In dry, wet, or continuously moist locations
(4) Indoors or outdoors
(5) Where exposed or concealed
(6) Where embedded in plaster, concrete, fill, or other masonry, whether above or below grade
(7) In any hazardous (classified) location
(8) Where exposed to oil and gasoline
(9) Where exposed to corrosive conditions not deteriorating to its sheath
(10) In underground runs where suitably protected against physical damage and corrosive conditions.
(11) In or attached to cable tray
FPN: The "Uses Permitted" is not an all-inclusive list."

Substantiation: The deletion of 332.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness while making it clear that the list of "Uses Permitted" is not an all-inclusive list. The panel actions on Proposals 7-84 and 7-85 were incorporated into the revised text.

Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:

DALY: NEMA does not find it appropriate to add the phrase "and in other locations and conditions not prohibited by 332.12 or elsewhere in the Code", and it should be deleted. NEMA considers this phrase to be new material, and is particularly concerned with the impact this could have on specialized Articles without having had appropriate review by other panels and other interested parties.

SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-31 Log #2438 NEC-P07 **Final Action: Reject**
(332.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-88
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"332.12 Uses Not Permitted.

Type MI cable shall not be used where exposed to conditions that are destructive and corrosive to the metallic sheath unless additionally protected by materials suitable for the conditions."

Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Reject
Panel Statement: The panel understands that the requirements in the panel action on Proposal 7-88 meet the submitter's intent.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-76 Log #1257 NEC-P07 **Final Action: Accept in Principle**
(332.12)

Submitter: Barry F. O'Connell, Tyco Thermal Controls
Comment on Proposal No: 7-88
Recommendation: Revise text to read as follows:

(1) In underground runs unless adequately protected from physical damage.

Substantiation: In the proposal as worded, Uses Not Permitted seems overly restrictive.

MI has traditionally been allowed to be used "...in underground runs where suitably protected against physical damage and corrosive conditions".

- In the case of burying in concrete, no additional protection has been required. MI's sheath is considered equivalent to some level of conduit protection, and "suitably protected" meant simply a jacket to protect from corrosion.
- In addition, for MI (and other cable types), "suitable protection" also meant simply burying under a sufficient depth of soil as allowed by 300.5 (Table 300.5).

I would like to request a change in wording as shown. While "suitable" and "adequate" may seem equal in effect, the word "adequate" is already used in the code referring to physical protection:

300.4 Protection Against Physical Damage. Where subject to physical damage, conductors shall be adequately protected.

As things stand, Uses Not Permitted appears to deny using MI underground unless added protection from physical damage is employed: in concrete encasement, or buried in accordance with 300.4, this could be interpreted to mean MI + conduit, which it never has heretofore.

Panel Meeting Action: Accept in Principle

Revise the wording in the comment to read as follows: "(1) In underground runs unless protected from physical damage, where necessary."

Panel Statement: Use of the words "suitably" and "adequately" is not in compliance with the NEC Style Manual. The revised wording will permit the authority having jurisdiction to determine if additional protection is required.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-77 Log #1258 NEC-P07 **Final Action: Accept in Principle**
(332.12)

Submitter: Barry F. O'Connell, Tyco Thermal Controls
Comment on Proposal No: 7-87
Recommendation: The draft code correctly interpreted the Panel's intent as I understood it. The "severe physical damage" term is used in connection with EMT, busways, fittings, and is not appropriate for a tough cable such as M.I.
Substantiation: A point of clarification on the Panel Action: the wording indicated that EMT does not have the equivalent crush resistance as MI cable, with the intent I believe of not accepting the second part of the proposal. However, the Panel Action wording, however, included "and 2)", I think unintentionally.

I believe it should have read:

"The panel Rejects changing "conditions" to "agents", and Accepts in Principle the added phrase in the first sentence ~~and (2)~~."

Panel Meeting Action: Accept in Principle
Panel Statement: The panel understands that the submitter supports the panel action.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-78 Log #2109 NEC-P07 **Final Action: Reject**
(332.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-88
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by mem-

bers of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.

Panel Meeting Action: Reject

Panel Statement: The panel understands that the requirements in the panel action on Proposal 7-88 meet the submitter's intent.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-79 Log #520 NEC-P07 **Final Action: Reject**
(332.40(C) (New))

Submitter: David Sroka Turner Falls, MA

Comment on Proposal No: 7-91

Recommendation: Add a new 332.40(C) to read:

"332.40(C) Termination. MI cable sized #6 AWG and larger shall not terminate directly on circuit breaker or disconnect switch lugs. These lugs are listed for multi-stranded conductor use only per Table 8."

Substantiation: It is not common field knowledge that lugs are listed in accordance to stranding requirements set forth in Table 8. Therefore, incorrect installation (poor electrical contact) of large, solid conductors in mechanical lugs that are not made for this purpose occurs. A compression lug would be required for this use. No compression lugs are currently available (listed) for use with MI cable.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its position that the circuit breaker must be used in accordance with its listing. The recommendation is not currently precluded in the Code.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-80 Log #3332 NEC-P07 **Final Action: Reject**
(332.60(B))

Submitter: James Conrad, Rockbestors-Surprenant Cable Corp.

Comment on Proposal No: 7-92

Recommendation: Reject Proposal 7-92 ROP.

Substantiation: The terms "open runs" and "exposed" are not the same no matter how many times they are used in the NEC. The submitter has not thought through the effects this would have on conductor temperature when installed as open run, like on a messenger cable, versus exposed, like attached to a surface. There should be a study on these conditions before a change is made. There is no safety concern the way it is currently worded.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its support of the submitter's position as stated in his substantiation on Proposal 7-92. An open run is not defined in the Article 100 defintions and therefore should be eliminated.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-82 Log #3333 NEC-P07 **Final Action: Reject**
(332.104)

Submitter: James Conrad, Rockbestors-Surprenant Cable Corp.

Comment on Proposal No: 7-93

Recommendation: Reject proposal 7-93 ROP.

Substantiation: There is no UL standard to qualify this type of construction.

Panel Meeting Action: Reject

Panel Statement: The proposed material already exists in the 2002 NEC. UL utilizes CSA Standard C22.2 No. 124 for MI cable.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-81 Log #1256 NEC-P07 **Final Action: Accept**
(332.108)

Submitter: Barry F. O'Connell, Tyco Thermal Controls

Comment on Proposal No: 7-95

Recommendation: I support the panel action.

Substantiation: MI cable is designed to meet the requirements of 250.122, by the construction standard used by Underwriters Laboratories.

Panel Meeting Action: Accept

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

ARTICLE 334 — NONMETALIC-SHEATHED CABLE; TYPES NM, NMC, AND NMS

7-83 Log #2043 NEC-P07 **Final Action: Reject**
(334.2)

Submitter: William A. Wolfe, Steel Tube Institute of North America

Comment on Proposal No: 7-97

Recommendation: Accept this proposal in principal by accepting comment on Proposal 7-96.

Substantiation: The TCC is correct that the information regarding the appropriate locations for the cable types belongs in the definitions for clarity and user friendliness. Combining the two proposals satisfies the concerns of both submitters and picks up information formerly in Uses Permitted.

Panel Meeting Action: Reject

Panel Statement: Section 2.2.2 of the NEC Style Manual states: "Definitions shall not contain requirements or recommendations".

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-84 Log #2073 NEC-P07 **Final Action: Reject**
(334.2)

Submitter: William A. Wolfe, Steel Tube Institute of North America

Comment on Proposal No: 7-96

Recommendation: Accept this proposal in principal by combining with Proposal 7-97 from the TCC, as follows:

Type NM: Add "which is suitable for use in normally dry locations".

Type NMC: Add "which is suitable for use in dry, moist, damp or corrosive locations".

Type NMS: Add (within) "the same overall…..and suitable for use in normally dry locations".

Substantiation: The TCC (in Proposal 7-97) is correct that the information regarding the appropriate locations for the cable types belongs in the definitions for clarity and user friendliness. Combining the two proposals satisfies the concerns of both submitters and picks up information formerly in Uses Permitted.

Panel Meeting Action: Reject

Panel Statement: Section 2.2.2 of the NEC Style Manual states: "Definitions shall not contain requirements or recommendations".

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-85 Log #855 NEC-P07 **Final Action: Reject**
(334.10)

Submitter: Jamie McNamara Hastings, MN

Comment on Proposal No: 7-100

Recommendation: The panel should reconsider this proposal and accept it.

Substantiation: I do not agree with the submitter's substantiation in its entirety. The proposed text is clearer and more understandable for installers and electricians. The current text is ambiguous, confusing and, at times very controversial. In multifamily and other structures people can rarely agree on the permitted uses. It would be great to have clearly understandable text for the installer and Authority Having Jurisdiction alike. I have provided a letter to NFPA requesting some guidance on the current text for permitted and uses not permitted and the response from NFPA. My intent in requesting this information from NFPA was to get a clear understandng of permitted uses. Unfortunately, those I shared this information with get more confused and disenfranchised with the current text. If the current text is to remain so ambiguous, please respond with some clear text comments that are understandable to installers and electricians. I want to thank the panel members in advance for their time on such a highly charged and controversial topic.

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

Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position in support of the Standards Council decision in accepting Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.

The panel is not in agreement with the supporting material provided by the submitter, and it should not be considered as a formal interpretation of this section.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-86 Log #912 NEC-P07 **Final Action: Accept in Principle**
(334.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-99
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 334.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-91a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-87 Log #957 NEC-P07 **Final Action: Accept in Principle**
(334.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-87 to "Reject" Proposal 7-99 and that action on Comment 7-91a includes the accepted wording for 334.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-99
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-91a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-88 Log #2110 NEC-P07 **Final Action: Accept in Principle**
(334.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-88 to "Reject" Proposal 7-99 and that action on Comment 7-91a includes the accepted wording for 334.10.
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-99
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-91a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-89 Log #2506 NEC-P07 **Final Action: Accept in Principle**
(334.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-99
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"334.10 Uses Permitted.

Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

(1) One- and two-family dwellings.

(2) Multifamily dwellings permitted to be of Types III, IV, and V construction except as prohibited in 334.12.

(3) Other structures permitted to be of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

FPN No. 1: Building constructions are defined in NFPA 220-1999, Standard on Types of Building Construction, or the applicable building code, or both.

FPN No. 2: See Annex E for determination of building types [NFPA 220, Table 3-1].

(4) Cable trays, where the cables are identified for the use.

FPN: See 310.10 for temperature limitation of conductors.

(A) Type NM. Type NM cable shall be permitted as follows:

(1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3).

(2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC. Type NMC cable shall be permitted as follows:

(1) For both exposed and concealed work in dry, moist, damp, or corrosive locations, except as prohibited in 334.10(3).

(2) In outside and inside walls of masonry block or tile

(3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (1/16 in.) thick and covered with plaster, adobe, or similar finish

(C) Type NMS. Type NMS cable shall be permitted as follows:

(1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3)

(2) To be installed or fished in air voids in masonry block or tile walls

(3) To be used as permitted in Article 780
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-91a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-90 Log #2876 NEC-P07 **Final Action: Reject**
(334.10)

Submitter: Lawrence G. Perry, BOMA International
Comment on Proposal No: 7-106
Recommendation: Accept the proposal as submitted.
Substantiation: The panel ROP action was nonresponsive to a proposal seeking a specific technical revision to the code. The panel notes only that it "accepts the decision of the NFPA Standards Council." A review of the council decision (D#01-12) indicates not a single mention of substantiation for the introduction of new restrictions on the use of NM cable where it had previously been permitted. No technical justification or a new restrictions on the use of NM cable has been given by the panel or by the standards council.

Prior action by the council on a portion of the code does not change the future, ongoing responsibility of a panel to review and act.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position in support of the Standards Council decision in accepting Proposal 7-137 of the NEC 2001 Report on Proposals. The submitter's comment proposes to delete important provisions of that proposal that addressed the installation and permitted use of Type NM cable.

The Standards Council accepted the current text in the 2002 NEC as having been developed after extensive discussion of the technical issues by the task group and the panel. The panel further notes that the substantiation for those provisions was developed collectively from the many proposals submitted during the 2002 cycle and was derived from much of the work done by the NM cable task group.

The submitter has provided no technical documentation for deviating from the Standards Council action.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-91 Log #3427 NEC-P07 **Final Action: Accept in Principle**
(334.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-88 to "Reject" Proposal 7-99 and that action on Comment 7-91a includes the accepted wording for 334.10.
Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 7-99
Recommendation: This proposal should be rejected.
Substantiation: This proposal will create more problems than it will solve. The comments on Negative by Mr. Brown Mr. Schumacher, and Mr. Stewart should be more carefully considered. The explanation of negative by Gotham is also applicable here. The idea could work, but it must first be coordinated with UL listing information, which currently refers to Article 334. In particular, the language about "normally dry locations" has been completely lost, the remaining language "where exposed to excessive moisture or dampness" is too vague to be useful in enforcement.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-91a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-91a Log #CC707 NEC-P07 **Final Action: Accept**
(334.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-99
Recommendation: Reinstate the following text: "334.10 Uses Permitted.

Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

(1) One- and two-family dwellings.

(2) Multifamily dwellings permitted to be of Types III, IV, and V construction except as prohibited in 334.12.

(3) Other structures permitted to be of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as
identified in listings of fire-rated assemblies.

FPN No. 1: Types of building construction and occupancy classifications are defined in NFPA 220-1999, Standard on Types of Building Construction, or the applicable building code, or both.

FPN No. 2: See Annex E for determination of building types [NFPA 220, Table 3-1].

(4) Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.

FPN: See 310.10 for temperature limitation of conductors.

(A) Type NM. Type NM cable shall be permitted:

(1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3).

(2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC. Type NMC cable shall be permitted:

(1) For both exposed and concealed work in dry, moist, damp, or corrosive locations, except as prohibited in 334.10(3)

(2) In outside and inside walls of masonry block or tile

(3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (1 /16 in.) thick and covered with plaster, adobe, or similar finish

(C) Type NMS. Type NMS cable shall be permitted:

(1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3)

(2) To be installed or fished in air voids in masonry block or tile walls."
Substantiation: The deletion of 334.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness. The panel actions on Proposals 7-101, 7-109, 7-111, 7-112, 7-113, and 7-114 were incorporated into the revised text.

This wording is in conformance with the direction from the NFPA Standards Council regarding uses permitted.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:
SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-92 Log #3894 NEC-P07 **Final Action: Reject**
(334.10 & 334.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 7-100
Recommendation: CMP-7 Should acccept or Accept in principle Proposal 7-100.
Substantiation: CMP-7 Should acccept or Accept in principle Proposal 7-100. George Flach is absolutely correct. There is no Technical data introduced during the 2002 Code cycle and no supporting data for the 2005 cycle.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position in support of the Standards Council decision in accepting Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-93 Log #578 NEC-P07 **Final Action: Accept**
(334.10, 334.12, FPN No. 1)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 7-101
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered. The Technical Correlating Committee notes that NFPA 220 is the appropriate reference since that is the origin of Annex E. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel agrees that the correct reference is NFPA 220. Fine Print Notes 1 and 2 will remain as currently worded in the 2002 NEC.

The panel understands that the comment addresses 334.10(3), FPN No. 1 and No. 2.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-94 Log #2013 NEC-P07 **Final Action: Reject**
(334.10 and 334-12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 7-100
Recommendation: CMP-7 should accept in principle Proposal 7-100.

Substantiation: George Flach is absolutely correct. There is no technical data introduced during the 2002 Code cycle and no supporting data for the 2005 cycle.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position in support of the Standards Council decision in accepting Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-95 Log #3685 NEC-P07 **Final Action: Reject**
(334.10 and 334.12)

Submitter: George W. Flach, National Armored Cable Manufacturers Assn.
Comment on Proposal No: 7-100
Recommendation: Accept the proposal.
Substantiation: The proposal should be accepted on the basis of the original substantiation.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position in support of the Standards Council decision in accepting Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-96 Log #2091 NEC-P07 **Final Action: Reject**
(334.10 Exception (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-104
Recommendation: The proposal should be accepted in principle, changed to correlate with the removal of 334.10 and written in accordance with 2.6.1 of the NEC style manual, as follows: Insert a new exception after list item (2) as follows:
Exception to (1) and (2): Type NM, Type NMC, and Type NMS cables shall be permitted to be used in one and two-family dwellings, multi-family dwellings and other structures of Type I and II construction, provided that where such dwellings or structures exceed three floors above grade Type NM, NMC and Type NMS cables shall not be permitted to leave the floor or dwelling unit from which the cables originated. This exception shall only apply where the building is protected by an approved fire sprinkler system(s) installed on all floors as a complete system, or where the Type NM cable is concealed behind a thermal barrier as described in 362.10(2) or 362.10(5).
Substantiation: The reason Massachusetts has never developed specific affirmative substantiation for this wiring method is because there was never any compelling reason to restrict its use when the NEC instituted the three-story restriction. It was being used in high-rise construction at that time, and continues to this day. Indeed, it is being used without the fire-finish and/or sprinkler restrictions in this proposal. Regarding the comment in the voting, the submitter was in attendance at the NM Cable task group meeting and saw the material submitted at that time. The submitter recalls no information to the effect that Massachusetts has the highest percentage of apartment fires. The research data submitted to the NFPA Standards Council at the time of the appeal on Proposal 7-137 (2002 cycle) strongly suggests no loss correlation between Type NM cable and construction methods. In fact, the data suggests the reverse is true; nationally 1.7% of fires in apartments are attributable to fixed wiring, but the comparable statistics for Massachusetts and Michigan are 1.3% and 0.6% respectively. This is even more striking in view of the fact that Massachusetts has some of the oldest housing stock in the nation. As the discussions that took place in support of the development of NFPA 73 clearly showed, a principal factor in the likelihood of electrical fire origination is the age of the wiring system. I strongly doubt the existence of any data showing Type NM cable installed under the product standards of today creates a disproportionate fire risk.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that the submitter has not provided sufficient technical documentation that specifically addresses the basis for (1) the proposed limitation of the use of Type NM cable to the floor where it originates and (2) the need of utilizing an "approved fire sprinkler system(s)" to permit the intended use.
See also the panel action and statement on Comment 7-90.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-97 Log #2075 NEC-P07 **Final Action: Reject**
(334.10(2))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-107
Recommendation: If ANYTHING in the text of Proposal 7-137 (2002 NEC) from the NFPA Standards Council decision is changed, this proposal should be accepted.
Substantiation: We accept the Panel's statement, and the Standards Council decision, as long as no text is changed (including leaving the term "open runs" in 336-12(A)(1) – see Proposal 7-123). If any changes are made, the Panel Statement is not consistent with other actions.
We would suggest that the CMP include a statement "It is not the intent of the CMP that this section be interpreted to mean mixed occupancy buildings are classified as multi-family dwellings, even if they contain 3 dwelling units." This will prevent inaccurate interpretation, and provide legal support on the interpretation. (See Schumacher's negative comment.)
Panel Meeting Action: Reject
Panel Statement: The panel is unsure as to exactly what the submitter is requesting or the intent.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-98 Log #856 NEC-P07 **Final Action: Reject**
(334.12)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-116
Recommendation: The panel should reconsider this proposal and accept it.
Substantiation: Do to the limited mechanical strength of NM cables and its susceptibility to damage during and after installation. It is common to see the jacket of NM cable damaged and on occasion the conductor inside due to the current construction and installation practices. Installers do replace the cable or tape up damaged cables when they notice the cable is damaged, it is when it goes undetected we should have the most concern. NM cable has limited mechanical strength and damage resulting in grounds shorts or arcing faults at higher voltages increases the shock and fire hazards.
Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its postion that inadequate technical substantiation has been provided to support the reduction in voltage.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 12 Negative: 2
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: Studies have shown that fires can and do start in concealed spaces years after the initial installation of Type NM cable. The use of higher voltages only enhances the chances of fires.

7-99 Log #857 NEC-P07 **Final Action: Reject**
(334.12)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-118
Recommendation: The panel should reconsider this proposal and accept it in principle. It could be added to the current text of 334.12(A) as new number 11. It would not be appropriate to replace the existing text in 334.12(1) with the submitter's proposed text both are needed for clear understanding of the code.
Substantiation: This is nothing more than a clarification of the requirements for NM not to be damaged during installation (334.15(B)) protected from physical damage) and to closely follow the surface of the building finish (334.15(A) to follow surface). The submitter is correct in his substantiation, NM cable is impractical to install in any quantity in this type of construction (metal bar joists) without damaging the cable.
Panel Meeting Action: Reject
Panel Statement: The present text of 334.15(B) already covers requirements for protection from physical damage.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-100 Log #2111 NEC-P07 **Final Action: Accept in Principle**
(334.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-115
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles

that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Committee Comment 7-104a.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-101 Log #2504 NEC-P07 **Final Action: Accept in Principle**
(334.12)

Submitter: Wayne A. Lilly Bridgewater, VA

Comment on Proposal No: 7-115

Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:

"334.12 Uses Not Permitted.

(A) Types NM, NMC, and NMS. Types NM, NMC, and NMS cables shall not be used as follows:

(1) As open runs in dropped or suspended ceilings in other than one- and two-family and multifamily dwellings.

(2) As service-entrance cable.

(3) In commercial garages having hazardous (classified) locations as defined in 511.3.

(4) In theaters and similar locations, except where permitted in 518.4.

(5) In motion picture studios.

(6) In storage battery rooms.

(7) In hoistways or on elevators or escalators.

(8) Embedded in poured cement, concrete, or aggregate.

(9) In hazardous (classified) locations, except where permitted in the following:

a. 501.4(B), Exception

b. 502.4(B), Exception No. 1

c. 504.20

(10) Types NM and NMS. Types NM and NMS cable shall not be used as follows:

a. Where exposed to corrosive fumes or vapors

b. Where embedded in masonry, concrete, adobe, fill, or plaster

c. In a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish

d. Where exposed or subject to excessive moisture or dampness

Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Committee Comment 7-104a.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-102 Log #2908 NEC-P07 **Final Action: Hold**
(334.12)

Submitter: David H. Kendall, Carlon

Comment on Proposal No: 7-115

Recommendation: The Panel's revised wording should be revised further under Part B to state the following:

(4) Where exposed or subject to ~~excessive~~ moisture or dampness.

Substantiation: NM and NMS Cable is only permitted to be used in normally dry locations per 334.10(A)(1) and 334.10(C)(1). The 1999 NEC (336-4(a) and (b)) permitted NM and NMS Cable to be fished in voids of masonry block or tile walls where such walls were not subject to excessive moisture or dampness. The proposed language expands the use of NM and NMS cable into areas of dampness that could include under roofed open porches. See Locations in Article 100 for Damp.

Panel Meeting Action: Hold

The panel is holding the comment only.

Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 14

Vote Not Returned: 1 ANASTASI

7-103 Log #3225 NEC-P07 **Final Action: Reject**
(334.12)

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 7-116

Recommendation: The Panel should have accepted this proposal.

Substantiation: Due to the limited mechanical strength of NM cables and its susceptibility to damage during and after installation, it is common to see the jacket of NM cable damaged and on occasion the conductor inside due to the current construction and installation practices. Installers do replace the cable or tape up damaged cables when they notice the cable is damage, it is when it goes undetected we should have the most concern. NM cable has limited mechanical strength and damage resulting in grounds shorts or arcing faults at higher voltages increases the shock and fire hazards.

This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its position that inadequate technical substantiation has been provided to support the reduction in voltage.

Number Eligible to Vote: 15

Ballot Results: Affirmative: 12 Negative: 2

Vote Not Returned: 1 ANASTASI

Explanation of Negative:

BROWN: Limiting the voltage on NM cable to 150 volts to ground and/or 300 volts phase-to-phase is an additional safety enhancement and contributes to good code that protects life and property.

SCHUMACHER: See my Explanation of Negative Vote on Comment 7-98.

7-104 Log #3424 NEC-P07 **Final Action: Hold**
(334.12)

Submitter: Noel Williams, Noel Williams Consulting

Comment on Proposal No: 7-115

Recommendation: This proposal should be rejected or accepted in principle with the additional change:

Revise 334.12(B)(4) to read "In wet or damp locations."

Substantiation: This proposal will create more problems than it will solve. The comments on Negative by Mr. Brown, Mr. Schumacher, and Mr. Stewart should be more carefully considered. The explanation of negative by Gotham (ROP 7-8) is also applicable here. The idea could work, but it must first be coordinated with UL listing information, which currently refers to Article 334. In particular, the language about "normally dry locations" has been completely lost, and the remaining language "where exposed to excessive moisture or dampness" is too vague to be useful in enforcement. Wet and damp locations are well defined.
Panel Meeting Action: Hold
The panel is holding the Comment only.
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-104a Log #CC708 NEC-P07 **Final Action: Accept**
(334.12)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-115
Recommendation: Reinstate the wording in the proposal to read as follows: "334.12 Uses Not Permitted.
(A) Types NM, NMC, and NMS. Types NM, NMC, and NMS cables shall not be permitted:
(1) In any dwelling or structure not specifically permitted in 334.10(1), (2), and (3).
(2) Exposed in dropped or suspended ceilings in other than one- and two-family and multifamily dwellings.
(3) As service-entrance cable.
(4) In commercial garages having hazardous (classified) locations as defined in 511.3.
(5) In theaters and similar locations, except where permitted in 518.4(B).
(6) In motion picture studios.
(7) In storage battery rooms.
(8) In hoistways or on elevators or escalators.
(9) Embedded in poured cement, concrete, or aggregate.
(10) In hazardous (classified) locations, except where permitted by the following:
a. 501.4(B)(3)
b. 502.4(B)(3)
c. 504.20
(B) Types NM and NMS. Types NM and NMS cables shall not be used under the following conditions or in the following locations:
(1) Where exposed to corrosive fumes or vapors.
(2) Where embedded in masonry, concrete, adobe, fill, or plaster.
(3) In a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish.
(4) Where exposed or subject to excessive moisture or dampness."
Substantiation: The panel action on this panel comment will correlate with the panel action on Committee Comment 707, which added the "Uses Permitted" back into the Code. The panel actions on the following proposals were incorporated into this Committee Comment: 7-117, 7-122, 7-123, 7-129 and 7-130.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-105 Log #216 NEC-P07 **Final Action: Hold**
(334.12 Exception (New))

Submitter: Robert C. Duncan, Duncan Consulting, Inc.
Comment on Proposal No: 7-115
Recommendation: Add Exception under 334-12.
Exception: Type NM cable installed in a raceway system are permitted in Type I or II construction.
Substantiation: There is presently a listed NM Hybrid Cable on the market consisting of power, communications and signaling conductors under a common jacket. Without the Code permitting the use of this new type cable to be installed in raceways, the provisions of 780.6, 725.55 and 800.52 cannot be utilized.
Panel Meeting Action: Hold
The panel "holds" the comment only. The proposal remains Accepted in Principle in Part.
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-106 Log #2092 NEC-P07 **Final Action: Reject**
(334.12(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Massachusetts Electrical Code Advisory Committee
Comment on Proposal No: 7-120
Recommendation: The proposal should be accepted in principle, relocated based on the reorganization of 334.12 as item (4).
Substantiation: This proposal is not an attempt to expand the use of NM cable, or relax its installation requirements. It is simply an attempt to make the language match the intent. As was noted in other proposals (7-119 etc.) this wiring method should not be pulled over raw metal edges, or inadvertently used as webbing to support other items above a suspended ceiling. That was the concept behind the "in the open" prohibition. However, running this cable on a running board is perfectly safe, and has been done for generations in all jurisdictions. The proposal simply clarifies the intent, nothing more.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position in support of the Standards Council decision in accepting Proposal 7-137 of the NEC 2001 Report on Proposals, which was subsequently upheld by the NFPA Board of Directors.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-107 Log #2045 NEC-P07 **Final Action: Reject**
(334.12(A)(1))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-123
Recommendation: Reject this proposal.
Substantiation: The NM Cable Task Group for the 2005 cycle determined that no changes should be made to the Uses Permitted and Not Permitted for NM Cable. This is the only proposal that changes the text and intent for NM Cable as accepted by the Standards Council decision on this wiring method in the 2002 Code. It changes the intent without substantiation, as the open runs envisioned are not necessarily "on or attached to the surface", nor are they necessarily behind lift out panels.
The proponent's substantiation for change is not appropriate in this section.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its action to accept Proposal 7-123, and the panel agrees with the substantiation provided with Proposal 7-123.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-108 Log #2101 NEC-P07 **Final Action: Reject**
(334.12(A)(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-123
Recommendation: The proposal should be rejected.
Substantiation: Although probably unintended, this proposal has the effect of removing the wiring method from above any suspended ceiling with the exception of limited residential applications. By definition, the area above any suspended ceiling is exposed. If the proposal remains accepted, we end up with a verbal construction comparable to saying such and such wiring method is allowed to be used while immersed in water, but never below the water line. There has never been any substantiation produced to show that Type NM cable cannot be installed above suspended ceilings.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its action to accept Proposal 7-123, and the panel agrees with the substantiation provided with Proposal 7-123.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-109 Log #2880 NEC-P07 **Final Action: Reject**
(334.12(A)(1))

Submitter: Joseph A. Ross, Ross Seminars
Comment on Proposal No: 7-123
Recommendation: Reject Proposal 7-123.
Substantiation: The term "exposed (as applied to wiring methods)" permits Type NM cable to be installed where the cable closely follows the surface of the building finish or of running boards [334-15(A)] and in this manner behind panels designed to allow access. This has been permitted in the code for years.
To change "As opened runs in dropped..." to "Exposed in dropped..." is a major change and would prohibit the installation of Type NM cable from being installed in dropped or suspended ceilings in other than dwelling units.
Consider that NM cable installed as per 334.15(A), 2002 NEC above a sus-

pended ceiling is an "exposed" run but not an "open" (a whip, for example) run. Changing the term "open" to "exposed" is a drastic change with inadequate substantiation to restrict Type NM cable from being installed above a suspended ceiling of small insurance offices, real estate offices, barber shops, etc. etc.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its action to accept Proposal 7-123, and the panel agrees with the substantiation provided with Proposal 7-123.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-110 Log #3520 NEC-P07 **Final Action: Reject**
(334.12(A)(1))

Submitter: Henry A. Jenkins, Wake County, Inspections Development
Comment on Proposal No: 7-126
Recommendation: CMP 7 should have accepted this proposal and returned to the wording as it appeared in the 1999 NEC. During the 2002 Code cycle there was no supporting technical data or fact finding study to constitute the disallowing of NM the cable above a dropped or suspended ceiling in other than one- and two family and multifamily dwellings. Even in the submitter's substantiation he used the word "assumption" twice. CMP 7 rejected Proposal 7-137 during he 2002 cycle. This was also rejected by the TCC and NFPA members during the annual meeting. Proposal 7-137 did not past muster from the CMP 7 Task Group, however was accepted by the standards council. The standards council has no technical ability to overturn the panels, TCC's or the NFPA's members consensus due process.
Substantiation: One of the substantiation which has been sited by the Task Group is the contribution of PVC to the building or structure. This does not hold merit, for there is not an NEC section which prohibits the use of PVC conduit, ENT, or PVC jacketed Class 2 wiring above a dropped or suspended ceiling, which is not used for an air plenum and within a building construction type for which NM type cable can be used.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Committee Comment 7-104a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-111 Log #3022 NEC-P07 **Final Action: Reject**
(334.12(A)(2))

Submitter: Monte Ewing, State of Wisconsin
Comment on Proposal No: 7-99
Recommendation: Change "dwelling" to "residential" and "construction" to "occupancy". In non-residential occupancies.
Substantiation: NFPA 5000, ICC Codes, and local codes define residential occpancy uses. The reference to dwelling confuses building codes with NEC definitions where there are mixed uses such as one floor dormitories and one floor dwelling units or a hotel with mixed sleeping rooms and extended stay dwelling units.
Panel Meeting Action: Reject
Panel Statement: The terms "dwelling" and "construction" are more commonly used in the NEC, and building constructions are defined in NFPA 220. Proposal 7-99 deleted 334.10; it did not address 334.12(A)(2). The panel assumes that the submitter intended to refer to Proposal 7-115.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-112 Log #3021 NEC-P07 **Final Action: Reject**
(334.12(A)(2) Exception (New))

Submitter: Monte Ewing, State of Wisconsin
Comment on Proposal No: 7-99
Recommendation: Create an exception to read as follows:
Exception: Accessory building/detached garage where used in association with a residential dwelling unit.
Substantiation: The present code allows the use of NM cable exposed within a residential (dwelling) garage when it is attached to the residential building. But, when a detached garage is constructed for the same purpose and use, the NM cable is now required to be concealed behind a 15-minute finish. The occupancy hazard is the same so there shouldn't be a penalty for having a detached garage versus an attached garage.
Panel Meeting Action: Reject
Panel Statement: This is already allowed by 334.10(A)(1).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-113 Log #442 NEC-P07 **Final Action: Reject**
(334.12(A)(6))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 7-115
Recommendation: Revise (A)(6) of panel action:
(6) For use in hazardous (classified) locations of commercial garages as defined in 511.3.
Substantiation: Present wording appears to include all portions of commercial garages including office and storage spaces suitable cut off from classified areas. (A)(2) of panel action appears to permit installation such areas that comply with the 15 minute thermal rating. 511.3(A) and (A)(5) allow for unclassified locations. 513.7(A) Exception permits any wiring method permitted for unclassified locations. 501.4(B)(3) and 502.4(B)(3) nonincencive field wiring, permits any wiring method permitted for unclassified locations. 504.1 and 504.20 appear to permit this wiring method.
Panel Meeting Action: Reject
Panel Statement: This is already allowed by 334.12(A)(3).
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-114 Log #2559 NEC-P07 **Final Action: Hold**
(334.12(B)(4))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 7-115
Recommendation: Revise 334.12(B)(4) as revised by the Panel to read:
(4) In other than normally dry locations.
Substantiation: Because the text in the 2002 NEC in Uses Permitted has been deleted, 334.10(A) and (C) that permit NM and NMS to be used in normally dry locations, has been inadvertently changed. The Panel text in proposed (334.12(B)(4)) is insufficient.
In the 2002 NEC only NMC is permitted to be used in dry, damp, or moist locations (334.10(B)(1).
The specific use permitted for NM and NMS by the 2002 NEC, as well as previous codes, is "exposed or concealed in normally dry locations". In uses not permitted of the 2002 NEC, 334.12(a)(10)(d) does state "Where exposed or subject to excessive moisture or dampness," but that was used in conjunction with the normally dry permitted use, and actually emphasizes that NM and NMS are not to be used in other than dry installations.
NM has always been a dry location wiring method. The text accepted by the Panel changes that meaning without substantiation for doing so. The proposed text above corrects this oversight.
Panel Meeting Action: Hold
The panel is holding the comment only.
Panel Statement: This comment was held because it would introduce a concept that has not had public review by being included in a related proposal as published in the Report on Proposals.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-115 Log #2102 NEC-P07 **Final Action: Reject**
(334.15(B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-132
Recommendation: Reject the proposal.
Substantiation: The present methods in the NEC that are proposed for deletion have stood the test of generations, having survived essentially unchanged since long before the proposal submitter was born. This should remain with the AHJ to make a field evaluation of suitability. Heavy-wall black iron pipe will take considerably more abuse than even Schedule 80 RNC, particularly under cold conditions. The proposal also eliminates guard strips, which have also been used for generations. This proposal does not increase safety, nor do the technical changes imposed have even a smidgeon of technical substantiation or loss experience by way of justification. The submitter, a member of CMP 9, would like to point out that when the NM cable enters a box, it enters an enclosure that is not required to be listed. This proposal is not justified.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that pipe, guard strips, surface metal, or nonmetallic raceways that are not listed for areas of physical damage should not be referenced. These raceways and methods will not provide the physical strength required to protect the NM cable in an area that has been determined as an area of physical damage.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-116 Log #2909 NEC-P07 **Final Action: Accept in Principle**
(334.15(C))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 7-135
Recommendation: This proposal should be accepted as proposed.
(C) In Unfinished Basements. Where the cable is run at angles with joists in unfinished basements, it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables shall be run either through bored holes in joists or on running boards. NM cable used on a wall of a unfinished basement shall be installed in a listed conduit or tubing. Conduit or tubings shall utilize a nonmetallic bushing or adapter at the point where the cable enters the raceway. Metal conduit and tubings and metal outlet boxes shall be grounded.
Substantiation: I am sorry, 334.15(A) and (B) does not address the submitters concerns nor addresses conduits used on the wall of a unfinished basement. 334.15(C) addresses unfinished basements and should address the permitted wiring methods for unfinished basements. Inspectors and contractors are turning to this section for guidelines where NM cable runs down the wall to a light switch.
Contractors are arguing that NM Cable can be run down the unfinished basement wall to a switch without being installed in a raceway because 334.15(C) does not require it. The added text makes it clear that conduit or tubing is required for NM Cable to give it that extra protection and containment. In addition, 334.15(A) and (B) does not indicate the use of a bushing to protect the cable and the grounding of the metal raceways.
Panel Meeting Action: Accept in Principle
Revise the recommended text to read as follows: (C) In Unfinished Basements. Where the cable is run at angles with joists in unfinished basements, it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables shall be run either through bored holes in joists or on running boards. NM cable used on a wall of an unfinished basement shall be permitted to be installed in a listed conduit or tubing. Conduit or tubing shall utilize a nonmetallic bushing or adapter at the point where the cable enters the raceway. Metal conduit and tubings and metal outlet boxes shall be grounded.
Panel Statement: The panel recognizes that this wiring method is already permitted but not required.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

2-174 Log #577 NEC-P02 **Final Action: Accept**
(334.18 (New))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 7-136
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 2 for consideration of action in Article 210. This action will be considered by Code-Making Panel 2 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the TCC to consider the referred proposal and is rejecting the proposal.
Panel Statement: The submitter has not provided any technical substantiation to warrant the blanket expansion to all non-metallic sheathed cables in dwelling units. The panel has taken an occupancy approach to AFCI's. See panel action on Comment 2-91.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KING: I agree with the panel action to accept the direction of the Technical Correlating Committee but disagree with the panel action to reject the proposal. See my Explanation of Negative for Comment 2-91.

2-175 Log #858 NEC-P02 **Final Action: Reject**
(334.18)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-136
Recommendation: The panel should reconsider this proposal and accept it.
Substantiation: AFCIs are a proven safety feature and would protect people and property against the hazards of arcing faults and should be required on NM, NMC, and NMS cable. These wiring methods are inherently more susceptible to physical damage due to being nonmetallic cables. Panel 2 recognized the susceptibility of nonmetallic cables in accepting a proposal to change 210.12 to require cable wiring in dwelling unit bedrooms ahead of the AFCI to have a metallic sheath.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 2-174.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KING: See my explanation of negative vote on comment 2-176.

2-176 Log #3224 NEC-P02 **Final Action: Reject**
(334.18)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-136
Recommendation: The Panel should have accepted this proposal.
Substantiation: There is no restriction on the use of safety devices like AFCI (arc fault circuit interrupters) to an article that is currently requiring them. AFCI's are a proven safety feature and would protect people and property against the hazards of arcing faults and should be required on NM, NMC and NMS cable. These wiring methods are inherently more susceptible to physical damage due to being non-metallic cables. Panel 2 recognized the susceptibility of non-metallic cables in accepting a proposal to change 210.12 to require cable wiring in dwelling unit bedrooms ahead of the AFCI to have a metallic sheath.
This comment 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 Comment 2-174.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KING: I agree with the submitter's substantiation. Nonmetallic cables are more susceptible to physical damage than metal-jacketed cables. Construction materials such as metal framing studs can very easily damage nonmetallic cables as the cables are being installed creating an arc hazard. Screw and nail penetrations through nonmetallic cables concealed behind finished walls are a concern after construction is completed. Requiring AFCI protection for circuits supplying nonmetallic cables would reduce the number of fires due to arcing faults and could potentially save many lives.

7-117 Log #140 NEC-P07 **Final Action: Reject**
(334.30(B)(1))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 7-139
Recommendation: Accept as proposed.
Substantiation: The term, "crawlspace," in the original substantiation was not intended to add crawlspaces deep enough to permit installers not just access but the ability to move through them so as to enable securing cables. In very shallow under-building spaces supporting may be impracticable, and so qualify under this clause. The issue of moisture, etc., is addressed by 320.10(3), which 320.30(B)(1) does not override.
Panel Meeting Action: Reject
Panel Statement: Section 334.30(B)(1) addresses the submitter's concern.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-118 Log #139 NEC-P07 **Final Action: Reject**
(334.80)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 7-150a
Recommendation: Reword to "...carrying conductors ~~are bundled together and~~ pass through the same opening in..."
Substantiation: If the term "bundled" is understood by anybody to mean "together for at least 24 in.," especially if that definition ends up in Article 100, the intent of the submitter here might not be met if "bundled" is used. This revised wording describes the precise condition evaluated in the submitter's experiments.
Panel Meeting Action: Reject
Panel Statement: The panel affirms that the term "bundled" has different meanings in various articles of the NEC.

In 334.80, cables are not required to be physically bound together as required in 520.2. In 310.15(B)(2), reference is made to conductors that are stacked or bundled longer than 24 inches.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-119 Log #2104 NEC-P07 **Final Action: Reject**
(334.80)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Massachusetts Electrical Code Advisory Committee
Comment on Proposal No: 7-151
Recommendation: The proposal should be accepted.
Substantiation: The panel statement is correct but not on the issue. The reason for this proposal is the present wording precludes effectively using the 90°C rating of the wire in instances where insulation is not a factor. The classic example is to imagine (not at all far fetched, and unaffected by the action on Proposal 7-150a two 12-2 NM cables (or a single run of the new double-circuit NM cable) effectively bundled and running through uninsulated attic rafters (assume 110°F design temperature) to supply outlets on small appliance branch circuits in a kitchen. If the 90°C rating cannot be used, then the kitchen would need to be wired with 8 AWG cable, because even 10 AWG cable would fail to meet 240.4(B)(1). [30A x 0.8 x 0.71 = 17A]. On the other hand, if the proposal were accepted 12 AWG cable could be used [30A x 0.8 x 0.87 = 21A]. Does anyone seriously believe kitchens are being wired in 10 AWG cable, let alone 8 AWG? It seems clear that the literal text of the 2002 NEC is excessive.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that 334.112 specifies the requirement for 90 degree C insulated conductors. Section 334.80 already specifies that the ampacity of these cables cannot exceed the 60 degree C values in any installation.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-120 Log #2384 NEC-P07 **Final Action: Accept**
(334.80)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 7-150a
Recommendation: The Proposal should continue to be Accepted.
Substantiation: CMP 7 needs to review the CMP actions on Proposals 1-67 (Rejected) and 15-73 (Accepted) which would move the definition of "bundled" from 520.2 to Article 100. This definition is not appropriate for 334.80.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 336 — POWER AND CONTROL TRAY CABLE; TYPE TC

7-121 Log #859 NEC-P07 **Final Action: Reject**
(336.6)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-158
Recommendation: The panel should reconsider this propsoal and accept it.
Substantiation: The AHJ (authority having jurisdiction) is almost never capable of field evaluating the cable itself for its adequate use. The AHJ is there to verify compliance with the NEC. A listing assures the AHJ that the cable is safe to install for the use it is listed for. Listing resulting in uniform and non-biased inspections. Requiring listing of cables assures owners, installers, and AHJ the cable is safe for its intended use.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.
Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-122 Log #2077 NEC-P07 **Final Action: Reject**
(336.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-158
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.
The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.
Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-123 Log #3223 NEC-P07 **Final Action: Reject**
(336.6)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-158
Recommendation: The Panel should have accepted this proposal.
Substantiation: The AHJ (authority having jurisdiction) is almost never capable of field evaluating the cable itself for its adequate use. The AHJ is there to verify compliance with the NEC. A listing assures the AHJ that the cable is safe to install for the use it is listed for. Listing resulting in uniform and non-biased inspections. Requiring listing of cables assures owners, installers, and AHJ the cable is safe for its intended use.
This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.
Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-124 Log #913 NEC-P07 **Final Action: Accept in Principle**
(336.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-160
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 336.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-125 Log #958 NEC-P07 **Final Action: Accept in Principle**
(336.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-125 to "Reject" Proposal 7-160 and that action on Comment 7-129a includes the accepted wording for 336.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-160
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-126 Log #2112 NEC-P07 **Final Action: Accept in Principle**
(336.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-126 to "Reject" Proposal 7-160 and that action on Comment 7-129a includes the accepted wording for 336.10.
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-160
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.
When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.
The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-127 Log #2113 NEC-P07 **Final Action: Accept in Principle**
(336.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-127 to "Reject" Proposal 7-160 and the action on comment 7-129a includes the accepted

wording for 33.wording for 336.10.
Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-160
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.
When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.
The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-128 Log #2502 NEC-P07 **Final Action: Accept in Principle**
(336.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-160
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"336.10 Uses Permitted.
Type TC tray cable shall be permitted to be used in the following:
(1) For power, lighting, control and signal circuits.
(2) In cable trays, or in raceways, or where supported in outdoor locations by a messenger wire.
(3) In cable trays in hazardous (classified) locations as permitted in Articles 392, 501, 502, 504, and 505 in industrial establishments where the conditions of maintenance and supervisor ensure that only qualified persons service the installation.
(4) For Class I circuits as permitted in Article 725.
(5) For non-power-limited fire alarm circuits if conductors comply with the requirements of 760.27.
(6) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channel, Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor within the cable. In cables containing conductors size 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119(B).
(7) Where installed in wet locations, Type TC cable shall also be resistant to moisture and corrosive agents.
FPN: See 310.10 for temperature limitation of conductors.
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were

experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-129 Log #3442 NEC-P07 **Final Action: Accept in Principle in Part**
(336.10)

Submitter: David Wechsler, The Dow Chemical Company
Comment on Proposal No: 7-129
Recommendation: Delete all of Section 336.12 and revise the original wording of 336.10 in its entirety as follows:
336.10 Uses Permitted. Type TC tray cable shall be permitted to be used as follows:
(1) For power, lighting, control, and signal circuits.
(2) In cable trays, or in raceways, or where supported in outdoor locations by a messenger wire.
(3) In cable trays in hazardous (classified) locations as permitted in Articles 392, 501, 502, 504, and 505 in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation.
(4) For Class I circuits as permitted in Article 725.
(5) For non-power-limited fire alarm circuits if conductors comply with the requirements of 760.27.
(6) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channel, Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor within the cable.
(7) Where installed in wet locations, Type TC cable shall also be resistant to moisture and corrosive agents.
(8) Where exposed to direct rays of the sun, Type TC cable shall also be sunlight resistant.
(9) Where direct buried, Type TC cable shall be identified for such use.
(10) Type TC cable shall be permitted to be installed on brackets or cleats in accordance with 340.10(6).
Substantiation: While this comment writer has the greatest of respect for the subteam that has spent long hours trying to resolve NFPA style issues and while this subteam may believe that the recommendation offered to this Committee to eliminate the Uses Permitted for Type TC and rewrite the Uses Not Permitted are well intentioned, this action directly conflicts with the 90-1 stated purpose of the National Electrical Code and would have the least benefit to inspectors, installers, and users. The premise of the National Electrical Code is to define the "what" and "how's" to assure a safe electrical installation. Defining the "what not to's" or the "how not to's" has not been the approach taken within other NEC sections. Consider the needs of those needing the NEC; an installer wants to know how to perform a safe installation; the inspector needs to know how the installation should be done, so that he can accept it. Telling persons all the ways not to do the installation in the hopes that they might get it right is not a benefit; it is a disservice. The revised wording that has been proposed is not new material. It simply resulted by taking those items in the not permitted section that may now be eliminated and revising the Permitted section to address these issues, in a clear manner. So for instance rather than stating do not install Type TC unless it has mechanical protection (i.e., to protect it from physical damage), we can state install TC for example, in cable tray, which is a means of support recognized by the NEC that does offer protection. Or for example, rather than not permitting Type TC to be installed as open wiring on brackets or cleats except as permitted by 340.10(6), simply state install as permitted by 340.10(6) on brackets and cleats.
Panel Meeting Action: Accept in Principle in Part
In the first sentence, the panel does not accept "Delete all of Section 336.12 and" or Items (8), (9) and (10), and accepts the remainder of the comment in principle.
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-129a Log #CC709 NEC-P07 **Final Action: Accept**
(336.10)

Note: The Technical Correlating Committee understands that the action on Comment 7-143 further modifies this comment.
Submitter: Code-Making Panel 7
Comment on Proposal No: 7-160
Recommendation: Reinstate the wording in the proposal as follows: "336.10 Uses Permitted.
Type TC cable shall be permitted to be used:
(1) For power, lighting, control, and signal circuits.
(2) In cable trays
(3) In raceways
(4) In outdoor locations supported by a messenger wire
(5) For Class I circuits as permitted in Parts II and III of Article 725
(6) For non–power-limited fire alarm circuits if conductors comply with the requirements of 760.27.
(7) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channel, Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor
within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119(B).
The installation is in an industrial establishement with written safety procedures, where the conditions of maintenance and supervision ensure that only qualified persons service the installation.
(8) Where installed in wet locations, Type TC cable shall also be resistant to moisture and corrosive agents.
FPN: See 310.10 for temperature limitation of conductors."
Substantiation: The deletion of 336.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness. The panel actions on Proposals 7-159, 7-161, 7-162, 7-163, 7-164, 7-165, and 7-173a were incorporated into the revised text.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:
SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-130 Log #199 NEC-P07 **Final Action: Reject**
(336.10(6))

Submitter: Gerald Lee Dorna, Belden Wire & Cable
Comment on Proposal No: 7-168
Recommendation: Accept Proposal 7-168 in principal as shown below:
336.10(6) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and shall comply with either (a) or (b)
(a) The cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor within the cable.
(b) Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization shall be provided by an equipment grounding conductor within the cable.
Substantiation: The current reading of 336.10(6) does not show any distinction of use for 'type TC cable' as to 'type TC cable which complies with the crush and impact requirements of type MC'. The above change will give the reader the use distinction. It will also make the wording similar to type ITC Article 727.4 Uses Permitted (5) and (6), for ITC cables meeting crush and impact requirements of MC vs ITC cable not meeting crush and impact requirements of MC.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-131 Log #200 NEC-P07 **Final Action: Reject**
(336.10(6))

Submitter: Gerald Lee Dorna, Belden Wire & Cable
Comment on Proposal No: 7-168
Recommendation: Accept Proposal 7-168 in principal as shown below:
336.10(6) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and shall comply with either (a) or (b)
(a) The cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor within the cable.
(b) Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use (TC-OW) shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor within the cable.
Substantiation: The current reading of 336.10(6) does not show any distinction of use for 'type TC cable' as to 'type TC cable which complies with the crush and impact requirements of type MC'. The above change will give the reader the use distinction. It will also make the wording similar to type ITC Article 727.4 Uses Permitted (5) and (6), for ITC cables meeting crush and impact requirements of MC vs ITC cable not meeting crush and impact requirements of MC. The marking of tray cable 'TC-OW' which meets the crush and impact requirements of MC, will give the Authority Having Jurisdiction and the qualified person servicing the installation, the tools of distinction and to determine the allowable use installation.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-132 Log #1244 NEC-P07 **Final Action: Reject**
(336.10(6))

Submitter: Charles M. Trout, Maron Electric Co. Inc.
Comment on Proposal No: 7-169
Recommendation: This proposal should be Accepted in Principle. Do not delete as the proposal suggests but rather add a second and third paragraph to the exception to read:
The name(s) of the qualified person(s) shall be kept in a permanent record at the office of the establishment in charge of the completed installation and at the office of the Authority Having Jurisdiction. Notification of any changes in the employment of the designated qualified person(s) shall be made to the office of the Authority Having Jurisdiction.
A person designated as a qualified person shall possess the skills and knowledge related to the construction and operation of the electrical equipment and installation and shall have received documented safety training on the hazards involved. Documentation of their qualifications shall be on file with the office of the Authority Having Jurisdiction and the office of the establishment in charge of the completed installation.
Substantiation: It was not necessarily my desire to have the wording deleted. If the wording could be changed to include prescriptive requirements that could ensure that qualified persons are actually performing the maintenance and supervision as requested by the exception. The National Electrical Code is a prescriptive code and it is the technical committees' responsibility to ensure that prescriptive requirements are present for the Authority Having Jurisdiction. Defining "Qualified Person" in Aritcle 100 does nothing to ensure the existence of a qualified person.
It is difficult to understand how it is possible to relax requirements for safety in a Code that tells us in 90.1(B), "this Code contains provisions that are considered NECESSARY for safety." This section further states that "Compliance therewith and proper maintenance will result in an installation that is ESSENTIALLY free from hazard but NOT NECESSARILY efficient, convenient, or ADEQUATE for good service or future expansion of electrical use." It appears to me that this tells us that these requirements are the MINIMUM requirements for safety and anything less will result in an installation that is NOT FREE FROM HAZARD.
Proponents of this travesty, knowing the truth in this, attempt to circumvent the obvious degradation of safety by using phraseology such as "the installation is under engineering supervision" or "a qualified person will monitor the system." What is monitoring the installation? What does engineering supervision mean?
I have submitted several proposals to delete these exceptions to requirements for safety but they were all rejected. Perhaps in the comment stage, enough persons will comment in favor of accepting these proposals or at least accepting them in a manner where some prescriptive requirements will be added to accurately describe what "engineering supervision" entails. What does "monitoring" the installation mean, what type of record keeping is necessary to assure compliance, what is a "monitor" or what is a "qualified person?" How is documentation of the qualifications and presence of a "qualified person" accomplished by the Authority Having Jurisdiction?
Without these prescriptive requirements, these exceptions to the requirements for safety appear to be "just another subterfuge to avoid compliance with the safety requirements of the National Electrical Code without regard to putting persons and equipment at risk."
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Committee Comment 7-129a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-133 Log #860 NEC-P07 **Final Action: Reject**
(336.12)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-173a
Recommendation: The panel should continue to accept this proposal.
Substantiation: This is a step in the right direction and gives guidance as to what an industrial establishment is or is not. The relaxation in the rules for industrial establishments should be clarified or removed all together. What is a industrial establishment?
Panel Meeting Action: Reject
Panel Statement: A written procedure for installation of TC cable in a cable tray provides no additional safety. Written procedures on safety in industrial establishments are already in place.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: The relaxation in the rules for industrial establishments should be clarified or removed from the code. This proposal gives guidance as to what constitutes an industrial establishment.

7-134 Log #956 NEC-P07 **Final Action: Accept in Principle**
(336.12)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-172
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We therefore recommend that "Uses Permitted" remain in the National Electrical code and that proposed wording in 336-12(3) (A) through (F) be deleted and the wording in 336.10(6) in the 2003 NEC remain in "Uses Permitted."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel actions and statements on Committee Comment 7-129a and Committee Comment 7-138a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-135 Log #2047 NEC-P07 **Final Action: Reject**
(336.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-172
Recommendation: Do not change "unsupported open runs" [in 336.12(3)] or "unsupported" [in 336.12(3)b] to "exposed" – as stated in the Panel Action.
Substantiation: The term "exposed" is inappropriate. "Exposed" is defined in the NEC as "on or attached to the surface" or "behind panels designed to allow access". The first instance would certainly not apply to "unsupported" cable, and the second likely would not apply to most installations in this section.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Committee Comment 7-138a.

Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-136 Log #2079 NEC-P07 **Final Action: Accept in Principle**
(336.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-172
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA should be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel actions and statements on Committee Comment 7-129a and Committee Comment 7-138a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-137 Log #2116 NEC-P07 **Final Action: Accept in Principle**
(336.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-172
Recommendation: Reject this proposal.
Substantiation: While we commend the Usability Task Group for undertaking such a difficult task, dropping "Uses Permitted" and trying to incorporate those requirements into "Uses Not Permitted" for cable and raceway articles has not accomplished the intent of aiding usability. This is a major code change and has not been consistently applied to all applicable articles, especially in Panel 8. If these proposals are accepted, the 2005 NEC would have some articles that have both Uses Permitted and Not Permitted and some that only have Uses Not Permitted which makes the Code more confusing not more user-friendly. During the Proposal stage, Panel 7 accepted the TCC directive to drop the Uses Permitted, while Panel 8 did not. Even if Panel 8 accepts the TCC directive during the comment change and accepts proposals that have been submitted to drop Uses Permitted on certain raceway articles, the Panel cannot change all of the other raceway articles at this time because they would not have public review. Negatives by Panel 7 representatives from NECA, ABC, IBEW, and IEEE and the Panel 8 rejection show that there is strong disagreement by members of the engineering community and installers who do not find this to be a user-friendly change.

When this type of significant code change is made, upon publication of the new code NFPA would be able to make a statement about the change that would cover all pertinent articles so that code users understand the change that has been made. If these changes continue to be accepted, NFPA will not be able to do so since the changes are not consistent across all applicable articles.

The code has included "Uses Permitted" and "Uses Not Permitted" for years. Delaying the new concept for one more cycle until all articles can be changed at the same time would not interfere with the usability of the code. This idea needs more study and should be delayed until the next code cycle so that these issues can be worked out.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel actions and statements on Committee Comment 7-129a and Committee Comment 7-138a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-138 Log #2500 NEC-P07 **Final Action: Accept in Principle**
(336.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-172
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"336.12 Uses Not Permitted.
Type TC tray cable shall not be used in the following:
(1) Installed where it will be exposed to physical damage
(2) Installed as open cable on brackets or cleats, except as permitted in 340.10(6)
(3) Used where exposed to direct rays of the sun, unless identified as sunlight resistant
(4) Direct buried, unless identified for such use:
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel actions and statements on Committee Comment 7-129a and Committee Comment 7-138a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-138a Log #CC710 NEC-P07 **Final Action: Accept**
(336.12)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-172
Recommendation: Reinstate text to read as follows: "336.12 Uses Not Permitted.
Type TC tray cable shall not be:
(1) Installed where it will be exposed to physical damage
(2) Installed outside a raceway or cable tray system, except as permitted in 336.10(6)
(3) Used where exposed to direct rays of the sun, unless identified as sunlight resistant
(4) Direct buried, unless identified for such use."
Substantiation: The panel action on this panel comment will correlate with the panel action on Committee Comment 709, which added the "Uses Permitted" back into the Code. The panel actions on the following proposals were incorporated into this Committee Comment: 7-171 and 7-173.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-139 Log #2386 NEC-P07 **Final Action: Reject**
(336.12(7)(E), FPN)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 7-172
Recommendation: I agree with the Panel Action to Accept in Principle in Part but a FPN should have been added after 336.12(7)e to read:

FPN: Type TC cable that meets these requirements may be identified with the marking Type TC-ER.

Substantiation: Inclusion of the legend will aid the contractor, user and, in particular, the inspector in recognizing that the cable meets the requirements and is suitable for the application. The Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members – ANSI/UL 1277 has been revised to eliminate the marking "open wiring" and to include the suffix "-ER" for cables that meet the requirements of this section.
Panel Meeting Action: Reject
Panel Statement: The panel asserts that the material in the fine print note should be incorporated into the code language. See the panel action and statement on Comment 7-142.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-140 Log #3222 NEC-P07 **Final Action: Reject**
(336.12(3)(a))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-173a
Recommendation: The Panel should continue to accept this proposal.
Substantiation: This is a step in the right direction and gives guidance as to what an industrial establishment is or is not. The relaxation in the rules for industrial establishments should be clarified or removed all together. The mere fact that a installation is in an "industrial establishment" does not in and of itself, necessitate the need for a separate and frequently less stringent provision.

This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Reject
Panel Statement: A written procedure for installation of TC cable in a cable tray provides no additional safety. Written procedures on safety in industrial establishments are already in place.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:

BROWN: See my explanation of negative vote on Comment 7-133.

7-141 Log #3418 NEC-P07 **Final Action: Reject**
(336.12(3) and 336-12(7))

Submitter: Robert L. Seitz, Artech Engineering
Comment on Proposal No: 7-172
Recommendation: Action on Proposal 7-172 should be additionally modified to change "e" to "f" and "f" to "g" and add a new "e" as shown here.

e. Unsupported lengths, where protected by guarding or by location, at transitions between cable trays (or supports) and between cable tray (or support) and utilization equipment or device, that do not exceed 1.8 meters (6 ft).

Substantiation: With all the revision and changing of terms "unsupported" has been completely removed from the text. Transitions between cable tray and successive supports, or strut require some unsupported length to allow this transition to be made. Some unsupported length is also necessary for connection at the device or equipment to which the Type TC Cable is connected. To allow removal of equipment, cable tray and supports are required to stop short of the equipment to allow room to device, remove and replace the equipment without having to remove the support system. Small control stations, fixtures and other devices that have smaller cables connected to them generally require at least 6 in. of unsupported cable just to make the connection.

Without some allowance of "unsupported" Tray Cable an installation would be impossible. For connections to motors, and other equipment that require flexibility or that are subject to vibration the "unsupported" length provides isolation between equipment and the support system. For Stationary Batteries the cables and cable conductors require some unsupported length for the attachment to the battery terminals.

My experience with TC cable shows it to be a very durable item. We generally but the TC cable with Low Temperature jackets and insulation, with jacket resistance to UV, Oil and other factors included. Our installations always assure protection of any unsupported lengths by location and by guarding if there is any chance that normal work processes or maintenance activities might pose a risk to the cables. Additional strain relief is provided where external forces might pull on the cable. Installation is normally done by hand pulling, and laying in to cable tray to limit pulling tension and side wall pressure. If mechanical means are employed for pulling manufacturers instructions and values are followed, tension monitored with appropriate devices, to ensure that maximum tension and side wall pressure are not exceeded. Quality Control and Quality Assurance programs oversee such activities.

Recent changes to this article has created some confusion among engineers, electricians and inspectors as to what the real intent for the installation of Tray Cable. Also the Panels statement that "TC cable is not suitable to be installed exposed as a general wiring method." begs some explanation. With a crush and impact resistance equal or greater to that required for MC cable; with maximum pulling tension and side wall pressures provided by the manufacturer; the use of listed cable terminators; and the requirement that the cable not be installed where subject to physical damage, it is difficult to determine what other danger we are trying to avoid by the new language used.

With the current language, there is no allowance at all for any "unsupported" length. Some "unsupported" length should be allowed to permit practical installations and prevent conflict in interpreting what this article really intends. There will be some who figure there is an implied "unsupported" length where terminations and transitions occur. And others will take the language quite literally.
Panel Meeting Action: Reject
Panel Statement: It is the panel's intent that TC cable not installed in cable-trays, raceways, or messenger supported, as referenced in 336.10, shall be continuously supported and protected and in addition must be secured every 1.8 m (6 ft.).

This is adequately covered in the existing wording of 336.10 of the 2002 Code.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:

RUNYON: The panel action should have been to "Accept" or to "Accept in Principle". The wording as in 336.10(7) (Panel Comment 7-129a) does not appear to allow for any unsupported distance during the transitions from the cable tray to the utilization equipment. There must be some unsupported distances allowed to eliminate the transmission of vibration, to allow for removal of equipment, and in cases where the cable is dropping vertically, there is nothing to support the cable.

7-142 Log #2385 NEC-P07 **Final Action: Accept in Principle in Part**
(336-12(7)(E))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 7-172
Recommendation: I agree with the Panel Action to Accept in Principle in Part but the text in 336.12(7)e should read:

The TC cable complies with the crush and impact requirements of Type MC cable and is identified for such use with the marking Type TC-ER.

Substantiation: Inclusion of the legend will aid the contractor, user and, in particular, the inspector in recognizing that the cable meets the requirements and is suitable for the application. The Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members – ANSI/UL 1277 has been revised to eliminate the marking "open wiring" and to include the suffix "-ER" for cables that meet the requirements of this section.
Panel Meeting Action: Accept in Principle in Part

The panel accepts the additional phrase and accepts the remainder of the comment in principle:

Revise (7) to read as follows: "(7) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channel, Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use with the marking Type TC-ER shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor
within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119(B)."

Panel Statement: Due to reversal of the action on the Technical Correlating Committee Proposals 7-160 and 7-172, the panel has revised the location of this material.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-143 Log #917 NEC-P07 **Final Action: Accept in Principle**
(336-12(7)(a))

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-173a

Recommendation: Delete added text in total and return to text in 336.10(6) of the 2002 NEC.
Substantiation: This proposal will impose an unnecessary requirement on industrials that will not result in any increase in safety.

This total paragraph of Item 7) should be in Uses Permitted with "written safety procedures" removed.
Panel Meeting Action: Accept in Principle

Revise CC709, 336.10(7), to read as follows: "(7) In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, and where the cable is continuously supported and protected against physical damage using mechanical protection, such as struts, angles, or channel, Type TC tray cable that complies with the crush and impact requirements of Type MC cable and is identified for such use with the marking Type TC-ER shall be permitted between a cable tray and the utilization equipment or device. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor
within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119(B)."
Panel Statement: The panel understands that this material will supersede the text in Panel Comment 7-129a, 336.10(7). This panel action also incorporates the Recommendation from Comment 7-142.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-133.

7-144 Log #916 NEC-P07 **Final Action: Reject**
(336.12(8))

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-172
Recommendation: Change "or where supported" to "except when supported" by a messenger.
Substantiation: There is no justification for TC cable not to be installed as supported on a messenger.
Panel Meeting Action: Reject
Panel Statement: Section 336.12(1) and (8) currently permit TC cable to be installed where supported by a messenger.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 338 — SERVICE-ENTRANCE CABLE; TYPES SE AND USE

7-145 Log #861 NEC-P07 **Final Action: Reject**
(338.6)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-178
Recommendation: The panel should reconsider this proposal and accept it.
Substantiation: The AHJ (authority having jurisdiction) is almost never capable of field evaluating the cable itself for its adequate use. The authority having jurisdiction is there to verify compliance with the NEC. A listing assures the AHJ that the cable is safe to install for the use it is listed for. Listing resulting in uniform and nonbiased inspections. Requiring listing of cables assures owners, installers, and the AHJ that the cable is safe for its intended use.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.

Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-146 Log #2050 NEC-P07 **Final Action: Reject**
(338.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-178
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.

The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.

Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-147 Log #3221 NEC-P07 **Final Action: Reject**
(338.6)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-178
Recommendation: The Panel should reconsider this proposal and accept it.
Substantiation: The AHJ (authority having jurisdiction) is almost never capable of field evaluating the cable itself for its adequate use. The AHJ is there to verify compliance with the NEC. A listing assures the AHJ that the cable is safe to install for the use it is listed for. Listing resulting in uniform and nonbiased inspections. Requiring listing of cables assures owners installers and AHJ the cable is safe for its intended use.

This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that there are several methods of approving products and that one method should not be defined to the exclusion of the others. Substantiation has not been provided to indicate that there is a problem with the current products.

Standard products are listed; however, products designed for special applications or conditions may not fit the listing criteria.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 10 Negative: 4
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.
CANGEMI: See my explanation of negative vote on Comment 7-8.
SCHUMACHER: See my Explanation of Negative Vote on Comment 7-8.
STEWART: See my Explanation of Negative Vote on Comment 7-8.

7-148 Log #914 NEC-P07 **Final Action: Accept in Principle**
(338.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-180
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 338.10 in the 2002 NEC.
Substantiation: See my commenst on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-150a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-149 Log #959 NEC-P07 **Final Action: Accept in Principle**
(338.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-149 bto "Reject" Proposal 7-180 and that action on 7-150a includes the accepted wording for 338.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-180
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-150a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-150 Log #2499 NEC-P07 **Final Action: Accept in Principle**
(338.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-180
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"338.10 Uses Permitted.
(A) Service-Entrance Conductors. Service-entrance cable used as service-entrance conductors shall be installed as required by Article 230. Type USE used for service laterals shall be permitted to emerge from the ground outside at termination's in meter bases or other enclosures where protected in accordance with 300.5(D).
(B) Branch Circuits or Feeders.
(1) Grounded Conductor Not Insulated. Type SE service-entrance cables shall be permitted in wiring systems where all of the circuit conductors of the cable are of the rubber-covered or thermoplastic type.
(2) Grounded Conductor Not Insulated. Type SE service-entrance cable shall be permitted for use where the insulated conductors are used for circuit wiring and the uninsulated conductor is used only for equipment grounding purposes.
Exception: Uninsulated conductors shall be permitted as a grounded conductor in accordance with 250.140.
(3) Temperature Limitations. Type SE service-entrance cable used to supply appliances shall not be subject to conductor temperatures in excess of the temperature specified for the type of insulation involved.
(4) Installation Methods for Branch Circuits and Feeders.
(a) Interior Installations. In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Parts I and II of Article 334, excluding 334.80.
FPN: See 310.10 for temperature limitation of conductors.
(b) Exterior Installations. In addition to the provisions of this article, service-entrance cable used for feeders or branch circuits, where installed as exterior wiring, shall be installed as required by Article 225. The cable shall be supported in accordance with 334.30, unless used as messenger-supported wiring as allowed by article 396.
Type USE cable shall be installed outside in accordance with the provisions of Article 340. Where Type USE cable emerges from the ground at terminations, it shall be protected in accordance with 300.5(D).
Multiconductor service-entrance cable shall be permitted to be installed as messenger-supported wiring in accordance with Articles 225 and 396."
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-150a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-150a Log #CC711 NEC-P07 **Final Action: Accept**
(338.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-180
Recommendation: Reinstate the following text in 338.10: "338.10 Uses Permitted.
(A) Service-Entrance Conductors. Service-entrance cable shall be permitted to be used as service-entrance conductors and shall be installed in accordance with 230.6, 230.7, and Parts II, III, and IV of Article 230.
Type USE used for service laterals shall be permitted to emerge from the ground outside at terminations in meter bases or other enclosures where protected in accordance with 300.5(D).
(B) Branch Circuits or Feeders.
(1) Grounded Conductor Insulated. Type SE service-entrance cables shall be permitted in wiring systems where all of the circuit conductors of the cable are of the rubber-covered or thermoplastic type.
(2) Grounded Conductor Not Insulated. Type SE service-entrance cable shall be permitted for use where the insulated conductors are used for circuit wiring and the uninsulated conductor is used only for equipment grounding purposes.
Exception: Uninsulated conductors shall be permitted as a grounded conductor in accordance with 250.140, 250.32 and 225.30 through 225.40.
(3) Temperature Limitations. Type SE service-entrance cable used to supply appliances shall not be subject to conductor temperatures in excess of the temperature specified for the type of insulation involved.
(4) Installation Methods for Branch Circuits and Feeders.
(a) Interior Installations. In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Parts I and II of Article 334, excluding 334.80.
FPN: See 310.10 for temperature limitation of conductors.
(b) Exterior Installations. In addition to the provisions of this article, service-entrance cable used for feeders or branch circuits, where installed as exterior wiring, shall be installed in accordance with Part I of Article 225. The cable shall be supported in accordance with 334.30, unless used as messenger-supported wiring as permitted in Part II of Article 396.Type USE cable installed as underground feeder and branch circuit cable shall comply with Part II of Article 340. Where Type USE cable emerges from the ground at terminations, it shall be protected in accordance with 300.5(D). Multiconductor service-entrance cable shall be permitted to be installed as messenger-supported wiring in accordance with 225.10 and Part II of Article 396."
Substantiation: The deletion of 338.10 does not promote a user-friendly Code. The panel action on this panel comment is to resolve the issues related to user-friendliness. The panel actions on Proposals 7-183, 7-184, 7-186, 7-190, 7-191, 7-192, and 7-193 were incorporated into the revised text.
The panel chair recommends that a task group be appointed, comprised of members from Code-Making Panel 7, to review the addition of 338.12 for the next code cycle.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:
SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-151 Log #2105 NEC-P07 **Final Action: Reject**
(338-10(B)(4)(a))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Massachusetts Electrical Code Advisory Committee
Comment on Proposal No: 7-188
Recommendation: The proposal should be accepted in principle. Accept the wording of the proposal, but relocate the requirement (to correlate with the deletion of 338.10) as an amendment to 338.12(A)(3)(b).
Substantiation: Compelling substantiation was provided by NEMA and UL as part of Proposal 4-97 and 7-131 in the 1987 cycle, where in one case Type SE cable incinerated when covered with 7 inches of cellulose insulation, and in another controlled experiment, 2 AWG Type SE cable ran above its Table 310.16 ampacity while carrying less than two thirds of its rated current, running 96°C while carrying just 65A. This is not the result of theoretical calculations; these are actual test results. The panel should reconsider their action on this proposal based on the reasoning presented in the explanation of negative vote.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that inadequate technical substantiation was provided to justify this change.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-151a Log #2114 NEC-P07 **Final Action: Reject**
(338.12)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-194
Recommendation: Accept the panel action in principle. Edit the list item 338.12(A)(3)c. as follows:
"c. For exterior branch-circuit and feeder wiring unless the installation complies with Part I of Article 225, and the cable is supported in accordance with 334.30 or is run on a messenger cable in accordance with Part II of Article 396".
Substantiation: Editorial. This text flows much better and avoids a thoroughly confusing series to two instances of the word "unless."b
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 7-152.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-152 Log #2497 NEC-P07 **Final Action: Accept**
(338.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-194
Recommendation: This proposal should be rejected.
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.

This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.

CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.

The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept
Panel Statement: The panel understands that Proposal 7-194 is "Rejected" with the acceptance of this comment.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-153 Log #3391 NEC-P07 **Final Action: Reject**
(338.80)

Submitter: David A. Kerr, Jr., Tri-State Inspection Agency, Inc.
Comment on Proposal No: 7-179
Recommendation: You should reconsider this proposal and create a new 338.80 for ampacity. The confused reference to 334.80 is not adequate. You do not need technical substantiation to correct a mistake in the way article 338 was written.
Substantiation: You can refer to page 712 and 840 for technical substantiation. As Fred Hartwell points out on Page 857, power increases as the square of current. In addition, cables have no free air and a small surface area. Conduit normally has at least 60% air inside and a large surface area, allowing for heat to dissipate.
Panel Meeting Action: Reject
Panel Statement: No technical substantiation was submitted to justify this change. The panel is not certain which document(s) the submitter is requesting the panel to review when he points them to pages 712 and 840 for further technical substantiation.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-154 Log #1393 NEC-P07 **Final Action: Reject**
(339 (New))

Submitter: David Sroka Turner Falls, MA
Comment on Proposal No: 7-195
Recommendation: Add a new Article 339 or 333.
"Two-hour, fire-rated rubber insulated cable: Type RHH."
Note: Text should be submitted by the manufacturer.
Substantiation: This is obviously a critical use cable, rapidly gaining in popularity. Usage requirements should be spelled out the same as for MI. I believe it is most survivable when used in a rigid (threaded) conduit.

I disagree with this Article "...is not necessary for general wiring." MI cable has Article 332. Also, note MI cable in Table 310.13 is used "for special applications -2". Note 2 states "where design conditions require maximum conductor operating temperature above 90°C (194°F)."

Secondly, I don't think this "...requirement should appear in Chapters 5, 6 or 7." Articles 517, 695, 700 and 760 don't seem as appropriate as a new Article 333.
Panel Meeting Action: Reject
Panel Statement: No text has been provided for the panel to review. The panel encourages the submitter to provide the proposed text language during the next code cycle. In addition, the panel recommends that this issue be coordinated with Code-Making Panel 6 regarding type RHH insulation.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 340 — UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE: TYPE UF

7-155 Log #862 NEC-P07 **Final Action: Accept in Principle**
(340.6)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 7-196
Recommendation: The panel should reconsider this proposal and accept it.
Substantiation: The AHJ (authority having jurisdiction) is almost never capable of field evaluating the cable itself for its adequate use. The AHJ is there to verify compliance with the NEC. A listing assures the AHJ that the cable is safe to install for the use it is listed for. Listing resulting in uniform and non-biased inspections. Requiring listing of cables assures owners, installers, and the AHJ that the cable is safe for its intended use.
Panel Meeting Action: Accept in Principle
Revise 340.2 to read as follows:
"340.2 Definitions
Underground Feeder and Branch-Circuit Cable, Type UF. A factory assembly of one or more insulated conductors with an integral or an overall covering of nonmetallic material suitable for direct burial in the earth."

Panel Statement: The panel recognizes that the requirement for the listing that exists in 340.2 belongs in 340.6.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.

7-156 Log #2081 NEC-P07 **Final Action: Accept**
(340.6 (New))

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 7-196
Recommendation: Accept this proposal.
Substantiation: Mr. Brett is correct. As this Code continues with standardization of sections, a listing section with no requirement raises questions.
The TCC has currently instructed that Uses Permitted be deleted. They have taken the approach that anything absent in a "Uses NOT Permitted" section IS permitted. No entry in the listing section means it does not require listing. There is no justification for requiring most electrical products to be listed, and not requiring listing for wire conductors and cables – items critical to the installation.
Panel Meeting Action: Accept
Panel Statement: This is already covered in 340.2.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.

7-157 Log #3220 NEC-P07 **Final Action: Accept**
(340.6)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 7-196
Recommendation: The Panel should reconsider this proposal and accept it.
Substantiation: The AHJ (authority having jurisdiction) is almost never capable of field evaluating the cable itself for its adequate use. The AHJ is there to verify compliance with the NEC. A listing assures the AHJ that the cable is safe to install for the use it is listed for. Listing results in uniform and nonbiased inspections. Requiring listing of cables assures owners installers and AHJ the cable is safe for its intended use.
This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept
Panel Statement: This is already covered in 340.2.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 13 Negative: 1
Vote Not Returned: 1 ANASTASI
Explanation of Negative:
BROWN: See my explanation of negative vote on Comment 7-8.

7-158 Log #915 NEC-P07 **Final Action: Accept in Principle**
(340.10)

Submitter: H. R. Stewart, HRS Consulting
Comment on Proposal No: 7-197
Recommendation: Reinstate deleted text, to add back into the NEC as removed in this proposal. Wording should be as in 340.10 in the 2002 NEC.
Substantiation: See comment on Article 320, Proposal 7-8.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-160a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-159 Log #960 NEC-P07 **Final Action: Accept in Principle**
(340.10)

Note: The Technical Correlating Committee understands that the panel's action is to Accept the Recommendation in Comment 7-159 to "Reject" Proposal 7-197 and that action on comment 7-160a includes the accepted wording for 340.10.
Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 7-197
Recommendation: The final panel action should be to reject this proposal.
Substantiation: It is our belief that deleting the "Uses Permitted" section goes against the best needs of the users. Defining only the "Uses Not Permitted" means that users would have to possess a greater knowledge of the NEC in order to know what all the installation methods were and of these, now make a determination as to those that are still valid. Designers, installers, and inspectors all need to know what is permitted, as well as not permitted. We believe that the needs of the users can best be served by providing positive recommendations that reflect the "how to do", "what to do" needs. This additionally has been the approach taken throughout the NEC, as stated in 90-1(B) "Adequacy. This code contains provisions that are considered necessary for safety...". Safety training focuses on offering positive statements and providing an emphasis on "what to do" aspects. We, therefore, recommend that "Uses Permitted" remain in the National Electrical Code.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-160a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-160 Log #2464 NEC-P07 **Final Action: Accept in Principle**
(340.10)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-197
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"340.10 Uses Permitted.
Type UF cable shall be permitted as follows:
(1) For use underground, including direct burial in the earth. For underground requirement, see 300.5.
(2) As single-conductor cables. Where installed as single-conductor cables, all conductors of the feeder grounded conductor or branch circuit, including the grounded conductor and equipment grounding conductor, if any, shall be installed in accordance with 300.3.
(3) For wiring in wet, dry, or corrosive locations under the recognized wiring methods of this Code.
(4) Installed as nonmetallic-sheathed cable. Where so installed, the installation and conductor requirements shall comply with the provisions of Article 334 and shall be of the multiconductor type.
(5) For solar photovoltaic systems in accordance with 690.31.
(6) As single-conductor cables as the nonheating leads for heating cables as provided in 424.43.
(7) Supported by cable trays. Type UF cable supported by cable trays shall be of the multiconductor type.
FPN: See 310.10 for temperature limitation of conductors."
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-160a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-160a Log #CC712 NEC-P07 **Final Action: Accept**
(340.10)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-197
Recommendation: Reinstate the text in 340.10 as follows: "340.10 Uses Permitted.
Type UF cable shall be permitted as follows:
(1) For use under ground, including direct burial in the earth. For underground requirements, see 300.5.
(2) As single-conductor cables. Where installed as single-conductor cables, all conductors of the feeder grounded conductor or branch circuit, including the grounded conductor and equipment grounding conductor, if any, shall be installed in accordance with 300.3.
(3) For wiring in wet, dry, or corrosive locations under the recognized wiring methods of this Code.
(4) Installed as nonmetallic-sheathed cable. Where so installed, the installation and conductor requirements shall comply with Parts II and III of Article 334 and shall be of the multiconductor type.
(5) For solar photovoltaic systems in accordance with 690.31.
(6) As single-conductor cables as the nonheating leads for heating cables as provided in 424.43.
(7) Supported by cable trays. Type UF cable supported by cable trays shall be of the multiconductor type.
FPN: See 310.10 for temperature limitation of conductors."
Substantiation: The deletion of 340.10 does not promote a user-friendly Code. The panel action on this panel comment will resolve the issues related to user-friendliness. The panel actions on Proposals 7-200, 7-201, and 7-202 were incorporated into the revised text.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI
Comment on Affirmative:
SCHUMACHER: See my Explanation of Affirmative Vote on Comment 7-14a.

7-161 Log #2463 NEC-P07 **Final Action: Accept in Principle**
(340.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-203
Recommendation: This proposal should be rejected. The present language, as may be modified by action taken by the Panel on other proposals, should remain. The language as presented in the 2002 NEC is as follows:
"340.12 Uses Not Permitted.
Type UF cable shall not be used as follows:
(1) As service-entrance cable
(2) In commercial garages
(3) In theaters and similar locations
(4) In motion picture studios
(5) In storage battery rooms
(6) In hoistways, or on elevators or escalators
(7) In hazardous (classified) locations
(8) Embedded in poured cement, concrete, or aggregate, except where embedded in plaster as nonheating leads where permitted in 424.43
(9) Where exposed to direct rays of the sun, unless identified as sunlight resistant
(10) Where subject to physical damage
(11) As overhead cable, except where installed as messenger-supported wiring in accordance with Article 396."
Substantiation: I agree with the negative comments on this proposal. Additionally, the substantiation for this proposal states, in part, "All applications not covered by those limitations would be acceptable." This logic could pose a serious safety issue. Manufacturers, electricians, inventors and others are in the business of finding and developing new products, materials, and methods to sell and promote. The language in the substantiation would mean that a product, material or method that is not prohibited would automatically be accepted. This is contrary to the concepts in 90.1 and 110.3 that promote electrical safety and give the AHJ authority to judge suitability.
This logic would have the AHJ accept the product, material or method even if it were unsafe because it was not in the Uses Not Permitted list. Regardless of the diligence of the Panel, the Uses Not Permitted list alone may not cover a product, material or method that is yet to be. That could mean a three-year wait to provide coverage by the Code. For those political jurisdictions that do not adopt on a three-year cycle, the wait would be much longer.
CMP-8 has rejected those proposals that deleted the Uses Permitted section. The substantiation used by CMP-8 included "To remove "Uses Permitted" does not enhance uniform interpretation and usability." This is some of the same reasoning used by those who offered negative comments to this proposal.
The substantiation for the proposal also indicated that "a code-making panel identified concerns with the concept of trying to describe the "uses permitted" for a particular wiring method and not be in conflict with the "uses not permitted." It seems that this proposal was generated by the problems experienced by a single panel. The substantiation did not indicate that other panels were experiencing this same difficulty. It is also very interesting to note that the user industry, electricians, AHJs, designers, etc. have not submitted proposals to delete the Uses Permitted sections. It would seem that the Code is already user friendly in this area, as these "users" have not expressed a necessity to change the Code. Those who voted negative on the proposal substantiate this. They represent installers and designers. Their negative vote should be compelling evidence that those who use the code most often do not want or need this supposed user-friendly proposal. As an inspector, I find the current arrangement of uses permitted and uses not permitted to be very good Code. To quote a very wise author whom I do not know "If it ain't broke, don't fix it."
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Committee Comment 7-161a.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-161a Log #CC713 NEC-P07 **Final Action: Accept**
(340.12)

Submitter: Code-Making Panel 7
Comment on Proposal No: 7-203
Recommendation: Reinstate text to read as follows: "340.12 Uses Not Permitted. Type UF cable shall not be used:
(1) As service-entrance cable.
(2) In commercial garages.
(3) In theaters and similar locations.
(4) In motion picture studios.
(5) In storage battery rooms.
(6) In hoistways, or on elevators or escalators.
(7) In hazardous (classified) locations.
(8) Embedded in poured cement, concrete, or aggregate, except where embedded in plaster as nonheating leads where permitted in 424.43.
(9) Where exposed to direct rays of the sun, unless identified as sunlight resistant.
(10) Where subject to physical damage.
(11) As overhead cable, except where installed as messenger-supported wiring in accordance with Part II of Article 396."
Substantiation: The panel action on this panel comment will correlate with the panel action on Committee Comment 7-12, which added the "Uses Permitted" back into the Code. The panel action on the following proposal was incorporated into this Committee Comment: 7-204.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-162 Log #440 NEC-P07 **Final Action: Reject**
(340.12(2)(7))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 7-205
Recommendation: Accept proposal revised as follows:
(2) In hazardous (classified) locations as defined in 500.5 except where permitted in 501.4(B)(3); 502.4(B)(3), and 504.20.
Substantiation: Where installed as NMSC panel action (A)(2) for Proposal 7-115 Log 2020 Section 334.12 permits use as does 501.4(B)(3); 502.4(B)(2); and 504.20.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that Type UF cable is not permitted in hazardous locations or in commerical garages with or without hazardous locations. No technical substantiation was provided to support this expanded use.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-163 Log #441 NEC-P07 **Final Action: Reject**
(340.12(4))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 7-203
Recommendation: Delete (4) of proposal.
Substantiation: All areas of commercial garages are not classified locations. Panel action (A)(2) for proposal 7-115 Log 2020 permits use where installed as nonmetallic cable.
Panel Meeting Action: Reject

Panel Statement: The panel reaffirms its position that Type UF cable is not permitted in hazardous locations or in commerical garages with or without hazardous locations. No technical substantiation was provided to support this expanded use.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 342 — INTERMEDIATE METAL CONDUIT; TYPE IMC

8-6 Log #2465 NEC-P08 **Final Action: Reject**
(342.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-9
Recommendation: Delete the proposed words "not prohibited" and leave the word "permitted". The language would remain as it is in the 2002 NEC. That language is as follows:

"342.22 Number of Conductors.

The number of conductors shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9.

Cables shall be permitted to be installed where such use is permitted ~~not permitted~~ by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9."

Substantiation: This proposal should be rejected. The proposed language will permit cables to be installed in IMC unless the cable article prohibits the installation in IMC. This language will create several conflicts with other Code sections. The following is a list of at least some of those conflicts:

1. For other than the exception in 314.17(C), 314.17(B) and (C) require cables to be secured to boxes. The wording in these sections need to be revised to clearly permit cables in raceways from being secured to boxes.
2. The requirements in 320.10, 320.12, and 320.30 have no exceptions to permit AC cable to be installed in IMC thereby prohibiting the compliance with these sections. Type AC cable can not be secured to the box or structure if it is installed in a raceway.
3. 320.40 requires the terminations of Type AC cable to be provided with a fitting to protect the wires from abrasion. Raceway installations will make this difficult to do. Additionally, 314.16 does not provide a requirement for conductor fill allowance for a cable fitting within a box.
4. Sections 334.10, 334.12 and 334.30 have no exceptions to permit NM and NMC cables to be installed in IMC thereby prohibiting the compliance with these sections. These cable types can not be secured to the box or structure if they are installed in a raceway.
5. Sections 338.10, 230.51(A) and 334.30 do not contain provisions to permit SE cable to be installed in IMC without meeting the securing and supporting requirements. Type SE cable can not be secured to the box or structure if it is installed in a raceway.
6. Sections 340.10, 340.12 and 340.10(4) do not permit UF cable to be used without being secured.

The proposed language will permit cables to be installed in IMC without addressing the places in the Code where cables are required to be secured to boxes, secured to the structure or addressing box fill issues. Other issues to be considered include installing cables in pulling ells or other ells and how metallic cables are to be pulled through raceways, either by the cable sheath or the conductors. The proposed new wording would create a situation where the inspector and installer would be forced to accept one or the other requirements. This could easily mean that part of the country could be requiring cables to be secured and another part of the country ignoring the securing requirements in favor of raceway installations.

The current language creates no conflicts. It permits cable to be installed in IMC when the respective cable article permits such use. For example, 328.10(2) for Type MC cable and 330.10(7) for MC cable have such specific permission.

Whether or not we agree that cables should be permitted to be installed in raceway systems we should all agree that we are trying to write good Code. Creating conflicts, as would occur with this proposed change, is not good Code.

Panel Meeting Action: Reject
Panel Statement: The panel agrees with the submitter that there are issues with installing cables into raceways when it comes to support and securing of the cable and the termination of the cable.

However, the panel does not agree that revising the proposal back to its original text addresses these issues. Nothing in the original proposals eliminated the present requirements for securing and supporting cables in accordance with their respective articles.

It is the responsibility of Panels 3, 7, and 8 to address the technical issues for these type of applications. Panel 8 recommends that a Task Group, through the NEC Usability Task Group, be created with members of Panels 3, 7, and 8 to address the issues of the submitter and/or any other issues that may exist and submit the appropriate proposals for the 2008 NEC.

CMP 8 acceptance of Proposal 8-9 only gives permission to install cables in raceways. However, CMP 7 and CMP 3 determine how cables are to be installed in raceways.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:

DABE: This comment should have been accepted until it has been demonstrated to this panel, that the panels overseeing each cable type has been made aware that, unless they specifically prohibit the installation of cable, it will be permitted.

LILLY: Acceptance of this proposal will result in the inspection, installation and design portions of the electrical industry being asked to choose between meeting the cable article requirements or installing the cable in a complete conduit or tubing system and ignoring the cable article requirements.

Proposal 8-9 replaces the word "permitted" with the words "not prohibited." This change means that cables will be permitted in complete conduit and tubing systems when they are "not prohibited" by the respective cable article. This is a dramatic change from the language in the 2002 NEC which permitted cables to be installed in complete conduit or tubing systems only when the cable article contained such permission. It would seem that this change prevents Panel 7 from utilizing the expertise it has to judge the suitability and safety requirements of a specific cable for such issues as pulling through and use within conduits or tubings and their fittings, such as pulling ells; judging the ability of cable conductors to withstand damage when exiting a metallic jacketed cable when not protected by a fitting design; and determining the amount of stress the cable may subject to terminations because the cable is not secured by a fitting, such as a box connector.

Panel 7 is charged with determining the installation requirements for cables. Some cable articles give specific permission for cable installation in raceways. Panel 7 has reviewed the cable and determined that it is safe for raceway installation. The change that this proposal is permitting will permit all cables to be installed in raceways even though Panel 7 has not reviewed the installation for suitability and safety.

Whether or not one agrees that cables should be installed in complete conduit and tubing systems, one should agree that the NEC should contain as few requirement and permission conflicts as possible. The permission granted by this proposal established a conflict in those requirements as the cable cannot be secured in the complete conduit or tubing system once it is installed within the conduit or tubing nor can it be supported in other than horizontal runs.

Other requirements are also ignored by the permission granted in this proposal. The following are examples:

1. 320.40 requires Type AC cable to terminate in a fitting to protect the wires from abrasion.
2. For other than some nonmetallic box installations, cables are required to be secured to boxes. Installation in a conduit or tubing system prevents this.

Other issues need to be considered in addition to the above.

1. Does pulling spiral metallic jacketed cables through conduit or tubing with up to 360 degrees of bends separate the jacket? Is the cable to be pulled by its outer sheath, inner conductors, or both?
2. What size pulling elbow is permitted to be used with cables without damaging the cable jacket as the cable is being inserted? Is the damage more likely to occur to metallic or nonmetallic jacketed cables?
3. Can cables be installed in conduit or tubing and meet the bending requirements for the cable while still meeting the permitted bending radius for the conduit or tubing?

These are but a few of the considerations that must be addressed. Panel 7 has the expertise to determine the installation requirements of cables. Panel 8 should not grant a blanket acceptance for cables in complete conduit or tubing systems because it lacks the expertise to determine the cable installation requirements.

The language in the 2002 NEC gives permission for cables to be installed in complete conduit or tubing systems when the respective cable article gives that permission. This means that Panel 8 has done what is required for the use of cables in complete conduit and tubing systems and also given Panel 7 the opportunity to address the safety issues associated with the installation.

8-7 Log #2470 NEC-P08 **Final Action: Reject**
(342.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-8
Recommendation: Delete the proposed words "not prohibited" and leave the word "permitted". The language would remain as it is in the 2002 NEC. That language is as follows:

"342.22 Number of Conductors.

The number of conductors shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9.

Cables shall be permitted to be installed where such use is permitted ~~not prohibited~~ by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9."

Substantiation: This proposal should be rejected. The proposed language will permit cables to be installed in IMC unless the cable article prohibits the installation in IMC. This language will create several conflicts with other Code sections. The following is a list of at least some of those conflicts:

1. For other than the exception in 314.17(C), 314.17(B) and (C) require cables to be secured to boxes. The wording in these sections need to be revised to clearly permit cables in raceways from being secured to boxes.

2. The requirements in 320.10, 320.12, and 320.30 have no exceptions to permit AC cable to be installed in IMC thereby prohibiting the compliance with these sections. Type AC cable can not be secured to the box or structure if it is installed in a raceway.

3. 320.40 requires the terminations of Type AC cable to be provided with a fitting to protect the wires from abrasion. Raceway installations will make this difficult to do. Additionally, 314.16 does not provide a requirement for conductor fill allowance for a cable fitting within a box.

4. Sections 334.10, 334.12 and 334.30 have no exceptions to permit NM and NMC cables to be installed in IMC thereby prohibiting the compliance with these sections. These cable types can not be secured to the box or structure if they are installed in a raceway.

5. Sections 338.10, 230.51(A) and 334.30 do not contain provisions to permit SE cable to be installed in IMC without meeting the securing and supporting requirements. Type SE cable can not be secured to the box or structure if it is installed in a raceway.

6. Sections 340.10, 340.12 and 340.10(4) do not permit UF cable to be used without being secured.

The proposed language will permit cables to be installed in IMC without addressing the places in the Code where cables are required to be secured to boxes, secured to the structure or addressing box fill issues. Other issues to be considered include installing cables in pulling ells or other ells and how metallic cables are to be pulled through raceways, either by the cable sheath or the conductors. The proposed new wording would create a situation where the inspector and installer would be forced to accept one or the other requirements. This could easily mean that part of the country could be requiring cables to be secured and another part of the country ignoring the securing requirements in favor of raceway installations.

The current language creates no conflicts. It permits cable to be installed in IMC when the respective cable article permits such use. For example, 328.10(2) for Type MC cable and 330.10(7) for MC cable have such specific permission.

Whether or not we agree that cables should be permitted to be installed in raceway systems we should all agree that we are trying to write good Code. Creating conflicts, as would occur with this proposed change, is not good Code.

Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-6.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
LILLY: See my Explanation of Negative Vote on Comment 8-6.

8-8 Log #2053 NEC-P08 **Final Action: Reject**
(342.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-10
Recommendation: Reject this proposal.
Substantiation: See our Comment on Proposal 8-24a.
Panel Meeting Action: Reject
Panel Statement: Relocating the table in Chapter 9 places the table where it is properly
associated with other tables containing information relative to raceways.

This table is referenced by a number of raceway articles. Location in Chapter 9 is consistent with the location of other tables and information that are also referenced by several articles.

See the panel action on Comment 8-9.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-9 Log #1029 NEC-P08 **Final Action: Accept**
(342.24(new Table 2))

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-10
Recommendation: This proposal should continue to be accepted.
Substantiation: Panel 8 did code users a service by consolidating the bending radius table and making it consistent for all applicable raceway types in the last cycle. The location in Article 342 was the only thing that was questionable. It makes more sense to have users go to Chapter 9 than to have users of any raceway type go to the article on RMC. Chapter 9 is a good place to put this since both Table 1 and the new Table 2 are applicable to all of the same wiring methods. Of course, most users will buy a bender that predetermines bending radius for most applications of this table, but the new location still makes more sense.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-10 Log #581 NEC-P08 **Final Action: Accept**
(342.30)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-12
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to further consider the comments expressed in the vote. See panel action on Comment 8-12.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-11 Log #2038 NEC-P08 **Final Action: Accept in Principle**
(342.30)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-12
Recommendation: Accept the proposal in principle. Do not delete "as provided in". Change "Article 300" to "300.18(A)."
Substantiation: The Style Manual objection to the 2002 NEC wording is valid, but the proposed change changes the intent without substantiation. It is sufficient to make the reference specific to 300.18(A).
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-12. The panel agrees with the submitter's substantiation and recommendation but believes that 300.18 should be referenced completely instead of just 300.18(A). This also keeps the language harmonized with other raceway articles.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-12 Log #2387 NEC-P08 **Final Action: Accept**
(342.30)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 8-12
Recommendation: The Proposal should be Accepted in Principle and reworded as follows:

IMC shall be installed as a complete system in accordance with 300.18 ~~as provided in Article 300~~ and shall be securely fastened in place and supported in accordance with 342.30(A) and (B).
Substantiation: This revised text will address the negative comment and still comply with the NEC Style Manual.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 344 — RIGID METAL CONDUIT: TYPE RMC

8-13 Log #2480 NEC-P08 **Final Action: Reject**
(344.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-23
Recommendation: Delete the proposed words "not prohibited" and leave the word "permitted". The language would remain as it is in the 2002 NEC. That language is as follows:

344.22 Number of Conductors.

The number of conductors shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9.

Cables shall be permitted to be installed where such use is permitted ~~not prohibited~~ by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9.
Substantiation: This proposal should be rejected. The proposed language will permit cables to be installed in RMC unless the cable article prohibits the installation in RMC. This language will create several conflicts with other Code sections. The following is a list of at least some of those conflicts:

1. For other than the exception in 314.17(C), 314.17(B) and (C) require cables to be secured to boxes. The wording in these sections need to be revised to clearly permit cables in raceways from being secured to boxes.

2. The requirements in 320.10, 320.12, and 320.30 have no exceptions to permit AC cable to be installed in IMC thereby prohibiting the compliance with these sections. Type AC cable can not be secured to the box or structure if it is installed in a raceway.
3. 320.40 requires the terminations of Type AC cable to be provided with a fitting to protect the wires from abrasion. Raceway installations will make this difficult to do. Additionally, 314.16 does not provide a requirement for conductor fill allowance for a cable fitting within a box.
4. Sections 334.10, 334.12 and 334.30 have no exceptions to permit NM and NMC cables to be installed in RMC thereby prohibiting the compliance with these sections. These cable types can not be secured to the box or structure if they are installed in a raceway.
5. Sections 338.10, 230.51(A) and 334.30 do not contain provisions to permit SE cable to be installed in RMC without meeting the securing and supporting requirements. Type SE cable can not be secured to the box or structure if it is installed in a raceway.
6. Sections 340.10, 340.12 and 340.10(4) do not permit UF cable to be used without being secured.

The proposed language will permit cables to be installed in IMC without addressing the places in the Code where cables are required to be secured to boxes, secured to the structure or addressing box fill issues. Other issues to be considered include installing cables in pulling ells or other ells and how metallic cables are to be pulled through raceways, either by the cable sheath or the conductors. The proposed new wording would create a situation where the inspector and installer would be forced to accept one or the other requirements. This could easily mean that part of the country could be requiring cables to be secured and another part of the country ignoring the securing requirements in favor of raceway installations.

The current language creates no conflicts. It permits cable to be installed in IMC when the respective cable article permits such use. For example, 328.10(2) for Type MC cable and 330.10(7) for MC cable have such specific permission.

Whether or not we agree that cables should be permitted to be installed in raceway systems we should all agree that we are trying to write good Code. Creating conflicts, as would occur with this proposed change, is not good Code.

Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-6.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
DABE: This comment should have been Accepted until it has been demonstrated to this panel that the panels overseeing each cable type has been made aware that, unless they specifically prohibit the installation of cable, it will be permitted.
LILLY: See my Explanation of Negative Vote on Comment 8-6.

8-14 Log #2481 NEC-P08 **Final Action: Reject**
(344.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-22
Recommendation: Delete the proposed words "not prohibited" and leave the word "permitted". The language would remain as it is in the 2002 NEC. That language is as follows:
"344.22 Number of Conductors.
The number of conductors shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9.
Cables shall be permitted to be installed where such use is permitted ~~not prohibited~~ by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9."
Substantiation: This proposal should be rejected. The proposed language will permit cables to be installed in RMC unless the cable article prohibits the installation in RMC. This language will create several conflicts with other Code sections. The following is a list of at least some of those conflicts:
1. For other than the exception in 314.17(C), 314.17(B) and (C) require cables to be secured to boxes. The wording in these sections need to be revised to clearly permit cables in raceways from being secured to boxes.
2. The requirements in 320.10, 320.12, and 320.30 have no exceptions to permit AC cable to be installed in RMC thereby prohibiting the compliance with these sections. Type AC cable can not be secured to the box or structure if it is installed in a raceway.
3. 320.40 requires the terminations of Type AC cable to be provided with a fitting to protect the wires from abrasion. Raceway installations will make this difficult to do. Additionally, 314.16 does not provide a requirement for conductor fill allowance for a cable fitting within a box.
4. Sections 334.10, 334.12 and 334.30 have no exceptions to permit NM and NMC cables to be installed in RMC thereby prohibiting the compliance with these sections. These cable types can not be secured to the box or structure if they are installed in a raceway.
5. Sections 338.10, 230.51(A) and 334.30 do not contain provisions to permit SE cable to be installed in RMC without meeting the securing and supporting requirements. Type SE cable can not be secured to the box or structure if it is installed in a raceway.
6. Sections 340.10, 340.12 and 340.10(4) do not permit UF cable to be used without being secured.

The proposed language will permit cables to be installed in IMC without addressing the places in the Code where cables are required to be secured to boxes, secured to the structure or addressing box fill issues. Other issues to be considered include installing cables in pulling ells or other ells and how metallic cables are to be pulled through raceways, either by the cable sheath or the conductors. The proposed new wording would create a situation where the inspector and installer would be forced to accept one or the other requirements. This could easily mean that part of the country could be requiring cables to be secured and another part of the country ignoring the securing requirements in favor of raceway installations.

The current language creates no conflicts. It permits cable to be installed in IMC when the respective cable article permits such use. For example, 328.10(2) for Type MC cable and 330.10(7) for MC cable have such specific permission.

Whether or not we agree that cables should be permitted to be installed in raceway systems we should all agree that we are trying to write good Code. Creating conflicts, as would occur with this proposed change, is not good Code.

Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-6.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
DABE: See my Explanation of Negative Vote on Comment 8-6.
LILLY: See my Explanation of Negative Vote on Comment 8-6.

8-15 Log #2083 NEC-P08 **Final Action: Reject**
(344.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-24a
Recommendation: Reject this proposal.
Substantiation: This proposal moves the Table for the radius of conduit or tubing bends from Article 344 to Chapter 9 without substantiation for doing so. This Table has been in Article 344 (Rigid Metal Conduit) for years because the Table was originally developed for this product. This is where code-users are accustomed to finding the information. As noted in Mr. Loyd's negative comment, the expansion tables for Rigid Nonmetallic Conduit were at one time relocated to Chapter 9 then returned to the Rigid Nonmetallic Conduit article for better usability and visibility. This Table should remain in Article 344. The other conduit and tubing articles currently reference this Table which is located conveniently in Chapter 3. There is no improvement in having the Table located in Chapter 9 since a reference to that location would still be required in each conduit/tubing article.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-8.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-16 Log #582 NEC-P08 **Final Action: Accept**
(344.30)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-26
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to further consider the comments expressed in the vote. See panel action on Comment 8-18.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-17 Log #2042 NEC-P08 **Final Action: Accept in Principle**
(344.30)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-26
Recommendation: Accept the proposal in principle. Do not delete "as provided in". Change "Article 300" to "300.18(A)."

Substantiation: The Style Manual objection to the 2002 NEC wording is valid, but the proposed change changes the intent without substantiation. It is sufficient to make the reference specific to 300.18(A).
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-12. The panel agrees with the submitter's substantiation and recommendation but believes that 300.18 should be referenced completely instead of just 300.18(A). This also keeps the language harmonized with other raceway articles.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-18 Log #2388 NEC-P08 **Final Action: Accept**
(344.30)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 8-26
Recommendation: The Proposal should be Accepted in Principle and reworded as follows:
RMC shall be installed as a complete system in accordance with 300.18 ~~as provided in Article 300~~ and shall be securely fastened in place and supported in accordance with 344.30(A) and (B).
Substantiation: This revised text will address the negative comment and still comply with the NEC Style Manual.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 348 — FLEXIBLE METAL CONDUIT: TYPE FMC

8-19 Log #116 NEC-P08 **Final Action: Reject**
(348.10, 349.18)

Submitter: Steven Heise, IBEW Local 58 Detroit
Comment on Proposal No: 8-33
Recommendation: Propose to make all set screws on couplings and connectors for conduit (EMT) to be of a hex head. Instead of the multislot head that is now used.
Substantiation: This would help to ensure that fittings are well secured.
Panel Meeting Action: Reject
Panel Statement: The panel understands that the submitter's comment is related to 358.42 of the 2002 NEC. A requirement such as this is not enforced by the Code. It is enforced by the product standard.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13
Comment on Affirmative:
WALBRECHT: I agree with the action taken by the Panel on Comment 8-19, but disagree with the panel statement:
1. The comment is to Proposal 8-33 which does not involve securement of EMT fittings.
2. The material is new and has not had the opportunity of public review.
3. The submitter did not specify proposed text, per 4-4.5(c) of the Regulations Governing Committee Projects.

8-20 Log #22 NEC-P08 **Final Action: Reject**
(348.12)

Submitter: Stanley J. Folz, Folz Electric, Inc.
Comment on Proposal No: 8-35
Recommendation: The panel should reconsider and accept the proposal.
Substantiation: The submitter is correct. It's time to stop the unnecessary use of this product in wet locations. As pointed out in the negative comments of the committee, "...there are listed forms of flexible conduit that are intended for use in wet locations".
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original action on Proposal 8-35. The commenter's substantiation does not demonstrate that the current text poses a safety issue.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-23.
WALBRECHT: The original submitter of Proposal 8-35 is correct in the substantiation. There are listed types of flexible conduit that are intended for use in wet locations. It is unnecessary to continue the practice of permitting conductors approved for wet locations and installations determined to be such that "liquid is not likely to enter the raceways or enclosure" in these applications. Liquidtight flexible conduit and fittings are readily available for use in wet locations.

8-21 Log #2044 NEC-P08 **Final Action: Reject**
(348.12(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-35
Recommendation: Accept the proposal.
Substantiation: This provision has been an embarrassment for a long time. It makes no sense to have rules focused on excluding water from wiring systems, and then allow a raceway that admits at every convolution if used outdoors, regardless of whether or not is arranged so it will not entrain that water into enclosures. Liquidtight flexible wiring methods are readily available for this purpose.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-20.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-23.
WALBRECHT: See my Explanation of Negative Vote on Comment 8-20.

8-22 Log #2560 NEC-P08 **Final Action: Reject**
(348.12(1))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 8-35
Recommendation: This proposal should be accepted.
Substantiation: FMC in a wet location is an unsafe and impracticable product for the application. FMC is not designed for wet locations. The current language is relying on the conductors for a safe application when using FMC in a wet location. Both LFMC and LFNC are available and listed for wet locations and outdoor applications and should be the products of choice.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-20.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
DAUBERGER: FMC is not designed for use in wet locations and it's a mistake to perpetuate its use for these installations. Liquidtight flexible metal conduit and liquidtight flexible nonmetallic conduit are listed for wet locations and are better suited for this application.
KENDALL: See my Explanation of Negative Vote on Comment 8-23.
WALBRECHT: See my Explanation of Negative Vote on Comment 8-20.

8-23 Log #2910 NEC-P08 **Final Action: Reject**
(348.12(1))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 8-35
Recommendation: This Proposal should be accepted.
Substantiation: The submitter is correct in his substantiation. Flexible Metallic Conduit is not designed for a Wet Location nor should be used in one. Liquidtight Flexible Metallic and Nonmetallic Conduit is designed for wet locations and would not require the conductors to be the only source of protection.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-20.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
KENDALL: The panel should have Accepted the original proposal. LFNC and LFMC are the safer raceways to use in this application. The panel should not wait for an injury to occur to demonstrate substantiation to change this use of FMC.
WALBRECHT: See my Explanation of Negative Vote on Comment 8-20.

8-24 Log #2477 NEC-P08 **Final Action: Reject**
(348.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-39
Recommendation: Delete the proposed words "not prohibited" and leave the word "permitted". The language would remain as it is in the 2002 NEC. That language is as follows:
"348.22 Number of Conductors. The number of conductors shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9, or as permitted in Table 348.22 for metric designator 12 (trade size 3/8).

Cables shall be permitted to be installed where such use is permitted ~~not prohibited~~ by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9."

Substantiation: This proposal should be rejected. The proposed language will permit cables to be installed in FMC unless the cable article prohibits the installation in FMC. This language will create several conflicts with other Code sections. The following is a list of at least some of those conflicts:

1. For other than the exception in 314.17(C), 314.17(B) and (C) require cables to be secured to boxes. The wording in these sections need to be revised to clearly permit cables in raceways from being secured to boxes.
2. The requirements in 320.10, 320.12, and 320.30 have no exceptions to permit AC cable to be installed in FMC thereby prohibiting the compliance with these sections. Type AC cable can not be secured to the box or structure if it is installed in a raceway.
3. 320.40 requires the terminations of Type AC cable to be provided with a fitting to protect the wires from abrasion. Raceway installations will make this difficult to do. Additionally, 314.16 does not provide a requirement for conductor fill allowance for a cable fitting within a box.
4. Sections 334.10, 334.12 and 334.30 have no exceptions to permit NM and NMC cables to be installed in IMC thereby prohibiting the compliance with these sections. These cable types can not be secured to the box or structure if they are installed in a raceway.
5. Sections 338.10, 230.51(A) and 334.30 do not contain provisions to permit SE cable to be installed in IMC without meeting the securing and supporting requirements. Type SE cable can not be secured to the box or structure if it is installed in a raceway.
6. Sections 340.10, 340.12 and 340.10(4) do not permit UF cable to be used without being secured.

The proposed language will permit cables to be installed in IMC without addressing the places in the Code where cables are required to be secured to boxes, secured to the structure or addressing box fill issues. Other issues to be considered include installing cables in pulling ells or other ells and how metallic cables are to be pulled through raceways, either by the cable sheath or the conductors. The proposed new wording would create a situation where the inspector and installer would be forced to accept one or the other requirements. This could easily mean that part of the country could be requiring cables to be secured and another part of the country ignoring the securing requirements in favor of raceway installations.

The current language creates no conflicts. It permits cable to be installed in IMC when the respective cable article permits such use. For example, 328.10(2) for Type MC cable and 330.10(7) for MC cable have such specific permission.

Whether or not we agree that cables should be permitted to be installed in raceway systems we should all agree that we are trying to write good Code. Creating conflicts, as would occur with this proposed change, is not good Code.

Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-6.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
LILLY: See my Explanation of Negative Vote on Comment 8-6.

8-25 Log #2478 NEC-P08 **Final Action: Reject**
(348.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-38
Recommendation: Delete the proposed words "not prohibited" and leave the word "permitted". The language would remain as it is in the 2002 NEC. That language is as follows:

"348.22 Number of Conductors. The number of conductors shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9, or as permitted in Table 348.22 for metric designator 12 (trade size 3/8).

Cables shall be permitted to be installed where such use is permitted ~~not prohibited~~ by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9."

Substantiation: This proposal should be rejected. The proposed language will permit cables to be installed in FMC unless the cable article prohibits the installation in FMC. This language will create several conflicts with other Code sections. The following is a list of at least some of those conflicts:

1. For other than the exception in 314.17(C), 314.17(B) and (C) require cables to be secured to boxes. The wording in these sections need to be revised to clearly permit cables in raceways from being secured to boxes.
2. The requirements in 320.10, 320.12, and 320.30 have no exceptions to permit AC cable to be installed in FMC thereby prohibiting the compliance with these sections. Type AC cable can not be secured to the box or structure if it is installed in a raceway.
3. 320.40 requires the terminations of Type AC cable to be provided with a fitting to protect the wires from abrasion. Raceway installations will make this difficult to do. Additionally, 314.16 does not provide a requirement for conductor fill allowance for a cable fitting within a box.
4. Sections 334.10, 334.12 and 334.30 have no exceptions to permit NM and NMC cables to be installed in FMC thereby prohibiting the compliance with these sections. These cable types can not be secured to the box or structure if they are installed in a raceway.
5. Sections 338.10, 230.51(A) and 334.30 do not contain provisions to permit SE cable to be installed in FMC without meeting the securing and supporting requirements. Type SE cable can not be secured to the box or structure if it is installed in a raceway.
6. Sections 340.10, 340.12 and 340.10(4) do not permit UF cable to be used without being secured.

The proposed language will permit cables to be installed in IMC without addressing the places in the Code where cables are required to be secured to boxes, secured to the structure or addressing box fill issues. Other issues to be considered include installing cables in pulling ells or other ells and how metallic cables are to be pulled through raceways, either by the cable sheath or the conductors. The proposed new wording would create a situation where the inspector and installer would be forced to accept one or the other requirements. This could easily mean that part of the country could be requiring cables to be secured and another part of the country ignoring the securing requirements in favor of raceway installations.

The current language creates no conflicts. It permits cable to be installed in IMC when the respective cable article permits such use. For example, 328.10(2) for Type MC cable and 330.10(7) for MC cable have such specific permission.

Whether or not we agree that cables should be permitted to be installed in raceway systems we should all agree that we are trying to write good Code. Creating conflicts, as would occur with this proposed change, is not good Code.

Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-6.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
DABE: See my Explanation of Negative Vote on Comment 8-6.
LILLY: See my Explanation of Negative Vote on Comment 8-6.

8-26 Log #2055 NEC-P08 **Final Action: Reject**
(348.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-41
Recommendation: Reject this proposal.
Substantiation: See our Comment on Proposal 8-24a.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-8.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-27 Log #2476 NEC-P08 **Final Action: Accept**
(348.30(A))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-43
Recommendation: Change the word "to" to the word "through" in item number 2 of the proposed Exception. The revised proposed Exception will then read:

Exception No. 2: At terminals where flexibility is required, lengths shall not exceed:

(1) 900 mm (3 ft) for metric designators 16 through 35 (trade sizes 1/2 through 1 1/4)

(2) 1200 mm (4 ft) for metric designators 41 ~~to~~ through 53 (trade size 1 1/2 through 2)

(3) 1500 mm (5 ft) for metric designators 63 (trade size 2 1/2) and larger.

Substantiation: This is an editorial revision to the proposed revised language that the Panel accepted. The Panel Statement includes the language "employing the word 'through' to make the requirements clear and including the maximum permitted size." After reviewing the Panel Statement, I believe the Panel intended the word "to" to be replaced with the word "through." This comment accomplishes the Panel's intent.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-28 Log #2475 NEC-P08 **Final Action: Accept**
(348.30(A) Exception No. 4 (New))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-45
Recommendation: Revise the proposed language to read as follows:
Exception No. 4: Lengths not exceeding 1.8 m (6 ft) from the last point ~~of support~~ where the raceway is securely fastened for connections within an accessible ceiling to luminaire(s) [lighting fixture(s)] or other equipment.
Substantiation: The proposed language could be construed as permitting FMC to be installed in lengths just under 10 1/2 ft from the last point where the raceway was securely fastened to the luminaire (lighting fixture). That would include a length just under the 4 1/2 ft permitted by the general rule plus the 6 ft permitted by the exception. No substantiation has been submitted to demonstrate the suitability of FMC to be installed in such lengths where it will be subjected to movement and contact within accessible ceilings. The proposed language will clearly state the length limit so that a length in excess of 6 ft from the last point of secure attachment will not be possible. This language will resolve confusion over the application of the exception.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-29 Log #1025 NEC-P08 **Final Action: Reject**
(348.60)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-49
Recommendation: The proposal should have been accepted.
Substantiation: This issue needs to be addressed. The language and intent of this section should be clear enough for reasonably uniform interpretation. That is not possible (and has not been the case) with the current language. (paragraph) The panel statement seems almost nonsensical: "The panel does not agree that flexibility is a concern only after installation." This must mean that flexibility during or before installation is a consideration in requiring an equipment grounding conductor. Does this mean that because the conduit is flexible during installation, an equipment grounding conductor is required? That would mean all flexible conduit requires an equipment grounding conductor, but proposals to this effect have been repeatedly rejected. The wire is not supposed to be installed until the conduit system is complete in most cases (300.18(A)), so obviously, an equipment grounding conductor is not required before or during installation. During the 1999 code cycle, Panel 8 decided vibration was not the issue. During this cycle, Panel 5 has said, in effect, that the language is purposely vague to allow "flexibility" for the AHJ in interpreting the rule. If that is also the intent of Panel 8, the panel should say so. (paragraph) The language of this section has changed slightly over the years with no apparent substantiation for an actual change in the intent of the rule. Originally, the idea was that equipment that was connected with "flex" so that the equipment could be moved would cause the flexible conduit to be subjected to breakage and pull-out at terminations, so a separate grounding path was needed. The proposed language in this comment would address the possibility that equipment might be moved around after being connected but while not "in use" - such as for maintenance or cleaning. It would also address movement while operating and in use. The proposed language also represents the most common (but not the only) interpretation of this rule. Nevertheless, the action of the panel is saying the common interpretation is not the intent without ever saying what the intent actually is.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original action on Proposal 8-49. The present language in 250.118(6) of the Code covers the submitter's concerns. The proposed additional wording is redundant to the requirements of 250.134(B) and 250.102.
The additional wording does not add any clarity to the intent of the Code.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-30 Log #2046 NEC-P08 **Final Action: Reject**
(348.60)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-49
Recommendation: Accept the proposal.
Substantiation: The submitter has been arguing this point and submitting comparable language over the last four cycles. See, for example Comment 5-135 in the 1999 cycle, when the proposed phrasing was "installed for the purpose of providing flexibility during use." If the flexible wiring method will be held steady after installation, the supplemental equipment grounding conductor accomplishes nothing. For example, this submitter wired a wood-framed room in EMT. Because of the way the roof and wall were framed at one point, it was impossible to get the EMT around the corner. The solution was a 12-in. length of _-in. FMC connected by changeover fittings at each end to EMT. The maximum overcurrent device was 20A. Was flexibility required? Yes. Is it (supplemental grounding conductor) now required after the completion of construction, when it is embedded in the wall framing and cannot move at all? Arguably Yes, because flexibility was required, even if for only about 5 minutes. The current wording in 250.118 keeps the mystery in play in spite of this submitter's prior efforts. The action on Proposal 8-51 also continues the problem by focusing on the word "flexibility" and not clarifying whether or not this is an ongoing condition. Although the substantiation and panel statement provide a correct implication of intent, positive code language is needed to settle this question.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on 8-29.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-31 Log #3519 NEC-P08 **Final Action: Accept**
(348.60)

Submitter: Henry A. Jenkins, Wake County, Inspections Development
Comment on Proposal No: 8-51
Recommendation: I support the action of the committee.
Substantiation: None.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13