ARTICLE 350 — LIQUIDTIGHT FLEXIBLE METAL CONDUIT: TYPE LFMC

8-32 Log #2473 NEC-P08 **Final Action: Reject**
(350.22(A))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-60
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:

"350.22 Number of Conductors or Cables.

(A) Metric Designators 16 through 103 (Trade Sizes 1/2 through 4). 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 LFMC unless the cable article prohibits the installation in LFMC. 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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.

8-33 Log #2474 NEC-P08 **Final Action: Reject**
(350.22(A))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-59
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:

"350.22 Number of Conductors or Cables.

(A) Metric Designators 16 through 103 (Trade Sizes 1/2 through 4). 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 LFMC unless the cable article prohibits the installation in LFMC. 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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.

8-34 Log #2085 NEC-P08 **Final Action: Reject**
(350.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-61
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

8-35 Log #3673 NEC-P08 **Final Action: Hold**
(350.30(A) Exception No. 2)

Submitter: Jerry D. Cain, Lodestar Energy Inc.
Comment on Proposal No: 8-43
Recommendation: 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 size 1/2 through 1 1/4)
(2) 1200 mm (4 ft) for metric designators 41 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: Please change Exception No. 2 in 350.30(A) to read the same as 348.30(A). The problem mentioned in Proposal 8-43 applies to both wiring methods. This will also maintain consistency in the NEC. Note all the exhibits listed in ROP 8-43 show liquid tight flexible metal conduit. The intent was to modify Article 350, however, in retrospect both articles should be modified since they have similar uses.

Panel Meeting Action: Hold
Panel Statement: The comment introduces new material that has not been previously acted upon. In accordance with Section 4-4.6.2.2(a) of the NFPA Regulations Governing Committee Projects, this comment is held, since the comment introduces new material that has not had public review.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-36 Log #2472 NEC-P08 **Final Action: Accept**
(350.30(A) Exception No. 4 (New))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-64
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 LFMC 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 LFMC 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

8-37 Log #1026 NEC-P08 **Final Action: Reject**
(350.60)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-68
Recommendation: This 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: See panel statement and action on Comment 8-29.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-38 Log #2049 NEC-P08 **Final Action: Reject**
(350.60)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-68
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 1/2-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 8-71 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 Comment 8-29.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-39 Log #3509 NEC-P08 **Final Action: Accept**
(350.60)

Submitter: Henry A. Jenkins, Wake County, Inspections Development
Comment on Proposal No: 8-71
Recommendation: I support the action of the committee.
Substantiation: None.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 352 — RIGID NONMETALLIC CONDUIT: TYPE RNC

8-40 Log #384 NEC-P08 **Final Action: Accept in Principle**
(352.10(H))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 8-75
Recommendation: Accept proposal.
Substantiation: See original substantiation. Panel statement is that "devices" is "intended" to apply to wiring devices (which a splicing device is per definition). Therefore, the statement infers that conduit bodies shall not contain splicing devices.
Panel Meeting Action: Accept in Principle
Revise the last sentence of 352.10(H) to read as follows: These conduit bodies shall not support luminaires (fixtures) or other equipment and shall not contain devices other than splicing devices as permitted by 110.14(B) and 314.16(C)(2)."
Panel Statement: The revised wording meets the submitter's intent.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-41 Log #2051 NEC-P08 **Final Action: Accept in Principle**
(352.12(E))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-78
Recommendation: Accept the proposal in principle. Simplify the language, as follows:
(E) Insulation Temperature Limitations. For conductors or cables operating at a temperature higher than the RNC listed temperature rating.
Substantiation: The panel action creates a wonderful example of exactly what the exception reform movement was trying to eliminate: exceptions that are so general they amount to an editorial contrivance to complete a thought. The proposed exception applies to all cables and conductors at all voltages under all degrees of supervision. As such, it is not an alternative to a basic code rule; it effectively becomes the code rule. This comment avoids the use of the exception entirely with simple, positive text that will not be understood.
The panel action was, in substance, correct. The issue cited in the voting could equally arise under the present code language. Many circuits rely, in effect, on accurate Article 220 load calculations to prevent conductor overheating; at some point an overcurrent device will operate but probably not until the conductor has run above 90°C for some period of time. The trade has also had a considerable period of time to get accustomed to the process of using a lower temperature column in Table 310.16 than the actual rating of the insulation, particularly when reviewing termination temperatures. This process will be the same; install the 105°C conductor, but evaluate its ampacity under the 90°C rating if it will be used in conventional RNC.
Panel Meeting Action: Accept in Principle
Revise proposed text in comment to read:(E) Insulation Temperature Limitations. For conductors or cables operating at a temperature higher than the RNC listed <u>operating</u> temperature rating.

Panel Statement: The panel agrees with the submitter that an exception should not be used. "Operating" was added to clarify that the conductors or cables cannot be operated above the RNC listed operating temperature. This will prevent confusion for the RNC listed ambient temperature.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
DABE: The submitter's text is more likely to be misinterpreted or overlooked than the text in the Report on Proposals.

8-42 Log #2052 NEC-P08 **Final Action: Reject**
(352.12(G) (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Massachusetts Electrical Code Advisory Committee
Comment on Proposal No: 8-82
Recommendation: The proposal should be accepted in principle. Accept the proposal as written, except delete the final clause "or the conduit is encased in not less than 50 mm (2 in.) of concrete."
Substantiation: The chemical composition of ENT and RNC is identical in its usual configuration, and the comparative volume of nonmetallic material per unit raceway length is even greater for RNC. That chemical composition and its behavior under fire conditions is what led to the final outcome of allowed uses for ENT. The NEC should treat this wiring method in a technically consistent manner.
Panel Meeting Action: Reject
Panel Statement: The panel continues to reject this proposal. The submitter has not submitted any technical substantiation that supports requiring restrictions on an acceptable use of rigid nonmetallic conduit.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-43 Log #2467 NEC-P08 **Final Action: Reject**
(352.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-84
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:
"352.22 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 LFMC unless the cable article prohibits the installation in LFMC. 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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.

8-44 Log #2469 NEC-P08 **Final Action: Reject**
(352.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-83
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:
"352.22 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 LFMC unless the cable article prohibits the installation in LFMC. 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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 LFMC 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.

8-45 Log #2058 NEC-P08 **Final Action: Reject**
(352.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-85
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

8-46 Log #138 NEC-P08 **Final Action: Reject**
(352.30(B))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-88
Recommendation: Replace proposed additional wording with the following:
The RNC support closest to an enclosure, and at any location where subject to disturbance, shall restrict the raceway's lateral movement.
Substantiation: Numerous proposals in this Code cycle to limit the size of holes used as support were turned down, so clearly CMP's do not consider securing even non-fished wiring systems against lateral movement necessary in all circumstances. Because even a small chance of stress where a raceway enters an enclosure has a larger-than-normal potential for interfering with grounding, or, in more extreme cases, damaging conductors, terminations, or equipment, securing that restricts movement, if not absolutely rigid securing, may be called for there. This is true as well as at other locations where damage might be likely if the raceway is merely run through a hole or otherwise supported. For instance, if there's six in. clearance under an existing deck, RMC might well be fished there, to be supported by the ground. However, if the clearance is closer to a foot, and awning supports are shoved under there over the winter, this would not be appropriate - even though securing the raceway will be rather difficult.
Panel Meeting Action: Reject
Panel Statement: The panel continues to reject this proposal. The additional wording does not add clarity to the present language. Stresses to termination points will not occur when the RNC is properly installed.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-47 Log #2056 NEC-P08 **Final Action: Reject**
(352.48)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-91
Recommendation: Accept the proposal in principle. Revise 352.44 to read as follows:
352.44 Expansion Fittings. Expansion fittings for rigid nonmetallic conduit shall be provided to compensate for thermal expansion and contraction where the length change will exceed, in accordance with Tables 352.44(A) and (B), 3 mm (1/8 in) at any one securely mounted item such as a box, cabinet, elbow, or other conduit termination.
Substantiation: The main problem with the existing wording is that one cannot assume the problem is only between two securely mounted boxes, etc. If that is the case, then the panel approach (1/4 inch) is fine because the box at each end only moves 1/8 inch. Suppose, however, the conduit 90's away from a brick inside corner on the left to a box on the right. The left side cannot move, so how much distance is allowed for the box? The full 1/4-inch will break the supports free of the box, as I have verified by test. The proposed wording is silent on this common occurrence. Another related problem in the wording concerns boxes mounted on either end of reverse 90's or the like. The conduit may expand and contract over its length much more than 1/4 inch and not put very much pressure on the boxes at all.
The point is, how much displacement should any fixed termination tolerate? The rule should be written to prevent, under any circumstances, RNC movement that will tend to displace a securely fastened item more than 1/8-inch due to field temperature fluctuation. The fact that this proposal was made by a RNC manufacturer indicates this field issue is continuing, and needs to be addressed.
Panel Meeting Action: Reject
Panel Statement: The original proposal dealt with permanently joining two pieces of conduit which would eliminate the separation of gasketed joints during contraction. The comment proposes a new requirement by changing the 6 mm (1/4") to 3 mm (1/8") without the sufficient technical substantiation needed. The current language of this section adequately conveys the requirements.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-48 Log #583 NEC-P08 **Final Action: Accept**
(353 (New))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-96
Recommendation: The Technical Correlating Committee advises that assignment of new Articles and Article Scope Statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Accepts" the Panel Action. The Technical Correlating Committee further directs the panel to revisit the Fine Print Note in 353.10 and make it a complete sentence as to what is being referenced. This action will be considered by the panel as a public comment.
For this issue relating to "Uses Permitted", see the Technical Correlating Committee Note on Proposal 8-102.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Revise the FPN in 353.10 to read as follows:
"FPN: Refer to 300.5 and 300.50 for underground installations."
Panel Statement: The revised text makes a complete sentence of the FPN per the TCC directive. See panel statement and action on Comment 8-54 addressing "Uses Permitted" and "Uses Not Permitted".
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-49 Log #866 NEC-P08 **Final Action: Accept in Principle**
(353)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 8-96
Recommendation: Copy current table 352 in Chapter 9 Table 4 and change its heading to read:
Article 353 High Density Polyethylene Conduit: Type HDPE Conduit.
Copy and insert the information in "Table 352 Rigid PVC Conduit, schedule 40", and
Revise text from the current table heading to "Article 352 — Rigid PVC Conduit (RNC), Schedule 40" ~~, and HDPE Conduit.~~
Substantiation: To clarify what this newly copied table is to be used with new article 353 or change heading of current table, see other comment.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-50.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-50 Log #867 NEC-P08 **Final Action: Accept**
(353)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 8-96
Recommendation: Revise text of the heading in Chapter 9 table 4 to read:
Articles 352 and 353 — Rigid PVC Conduit (RNC), Schedule 40, and HDPE Conduit.
Substantiation: To clarify what table in Capter 9 Table 4 is to be used with new Article 353 or copy current table and change the heading, see other comment.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-51 Log #2057 NEC-P08 **Final Action: Accept in Principle in Part**
(353 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-96
Recommendation: Accept the proposal in principle. Accept the language as prepared by CMP 8 except as included in the following suggested revisions:
1. In 353.2, replace "nonmetallic" with "high density polyethylene conduit"
2. In 353.10(4) FPN, add the clause "for required burial depths."
3. In 353.12(5), revise as follows: "(5) For conductors or cables operating at a temperature higher than the HDPE listed temperature rating."
4. In 353.46 FPN, change "at bushings" to "where pulled into raceways."
5. In 353.60 Exception No. 1, revise as follows: "The equipment grounding conductor shall be permitted to be run separately from the conduit where used for grounding dc circuits as permitted in 250.134 Exception No. 2."
6. In 353.60 Exception No. 2, revise as follows: "The equipment grounding conductor shall be permitted omitted where the grounded conductor is used to ground equipment as permitted in 250.142."
7. In 353.100, replace "suitable nonmetallic material" with "high density polyethylene."

Substantiation: 1. The definition as written literally includes polyvinyl chloride and all other nonmetallic conduits. A definition that fails to distinguish this new conduit from all others is pointless.
2. This wording is simple, to the point, and completes the sentence.
3. This is a much simpler way of saying exactly the same thing, more clearly, and without an exception. Refer to the submitter's substantiation on his comment on Proposal 8-78 for more information.
4. The cited rule does not necessarily involve a bushing, and its most important operational trigger is the process of pulling conductors into raceway. This comment more accurately conveys the intent.
5. The exception as written violates the complete sentence requirement in the Style Manual. In addition it is needlessly complex. The allowance in 250.134(B) Exception No. 1 need not be mentioned because this wiring method will never be used to retrofit a nongrounding branch circuit extension.
6. The exception as written violates the complete sentence requirement in the Style Manual.
7. The construction provision as written literally includes polyvinyl chloride and some other nonmetallic conduits. For example, polyvinyl chloride "is resistant to moisture and chemical atmospheres." It resists "moisture and corrosive agents." It is strong enough to withstand abuse whether by impact or crushing, etc. A construction requirement that fails to distinguish this new conduit from all others is pointless. The submitter is aware that there will undoubtedly be proprietary differences in manufacturing, however, all such conduit will be high-density polyethylene. Why not say so?

Panel Meeting Action: Accept in Principle in Part

Reject Item 1 and Item 4

The panel accepts in principle Items 2, 3, and 6 and revises to read as follows:
Item 2: In 353.10(4) FPN, to add the clause "for required burial depth" by revising the FPN to state:
"FPN: Refer to 300.5 and 300.50 for Underground Installations. "
Item 3: add the proposed text with the addition of the words "conduit" after HDPE and "operating" after "listed" so that 353.12(5) reads as follows"
"(5) For conductors or cables operating at a temperature higher than the HDPE Conduit listed operating temperature rating."
Item 6: 353.60 Exception No. 2 shall read as follows:
"The equipment grounding conductor shall not be required where the grounded conductor is used to ground equipment as permitted in 250.142."

The panel accepts: Item 5 and Item 7.

Panel Statement: Item 1: The definition describes that High Density Polyethylene Conduit is a nonmetallic conduit.
Item 4: The current language in the proposed 353.46 FPN is harmonized with all of the other raceway articles.
Item 2: See panel action on Comment 8-48.
Item 3: The panel agrees with the submitter that an exception should not be used. "Conduit" and "Operating" were added to clarify that HDPE conduit is used and that the conductors or cables cannot be operated above the HDPE conduit listed operating temperature. This will prevent confusion for the HDPE conduit listed ambient temperature.
Item 6: The submitted text is not complete. The revision meets the intent of the submitter.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:

DABE: The submitter's text for item No. 3 is more likely to be misinterpreted or overlooked than the text in the Report on Proposals.

ARTICLE 356 — LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT: TYPE LFNC

8-52 Log #584 NEC-P08 **Final Action: Accept**
(356.10)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-102
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the proposal and continues to reject the proposal.

See panel statement and action on Comment 8-54.

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

8-53 Log #2366 NEC-P08 **Final Action: Accept in Principle**
(356.10)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-102
Recommendation: Revise text to read as follows:

356.10 Uses Permitted. LFNC shall be permitted to be used in exposed or concealed locations for the following purposes:

FPN: Extreme cold may cause some types of nonmetallic conduits to become brittle and therefore more susceptible to damage from physical contact.

(1) Where flexibility is required for installation, operation, or maintenance
(2) Where protection of the contained conductors is required from vapors, liquids, or solids
(3) For outdoor locations where listed and marked as suitable for the purpose
(4) For direct burial where listed and marked for the purpose
(5) Type LFNC-B shall be permitted to be installed in lengths longer than 1.8 m (6 ft) where secured in accordance with 356.30
(6) Type LFNC-B as a listed manufactured prewired assembly, metric designator 16 through 27 (trade size 1/2 through 1) conduit

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.

See the panel statement and action on Comment 8-54.

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

8-54 Log #3602 NEC-P08 **Final Action: Reject**
(356.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-102
Recommendation: CMP 8 should have Accepted or Accepted in Principle Proposal 8-102.
Substantiation: This Task Group was assembled per the request of the Technical Correlating Committee.
Panel Meeting Action: Reject
Panel Statement: The panel does not agree with the task group recommendation. The panel is not in agreement with the concept of having only a "Uses Permitted" or "Uses Not Permitted" section in each of the raceway articles.

Having both "Uses Permitted" and "Uses Not Permitted" provides clarity. It gives installers and inspectors alike the guidance necessary to determine the proper application of the wiring method being considered.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-55 Log #585 NEC-P08 **Final Action: Accept**
(356-12)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-104
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-56 Log #864 NEC-P08 **Final Action: Accept**
(356.12)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 8-106
Recommendation: Revise text to read as follows:

356.12(4) Where the operating voltage of the contained conductors is in excess of 600 volts, nominal, except as permitted in 600.32(A).

356.12(5) In any hazardous (classified) location other than as permitted in 501.4~~1~~0(B), 502.4~~1~~0(A) and (B), 503.3~~ 1~~ 10(A), and 504.20.
Substantiation: To coordinate with other changes.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-57 Log #2365 NEC-P08 **Final Action: Accept in Principle**
(356.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-104
Recommendation: Revise text to read as follows:

356.12 Uses Not Permitted. LFNC shall not be used as follows:

(1) Where subject to physical damage

(2) Where any combination of ambient and conductor temperatures is in excess of that for which the LFNC is approved

(3) In lengths longer than 1.8 m (6 ft), except as permitted by 356.100(5) or where a longer length is approved as essential for a required degree of flexibility

(4) Where voltage of the contained conductors is in excess of 600 volts, nominal
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.

See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-58 Log #3537 NEC-P08 **Final Action: Accept**
(356.12)

Submitter: Elaine Thompson, Allied Tube & Conduit
Comment on Proposal No: 8-104
Recommendation: This proposal should continue to be rejected but if the panel accepts the TCC comment, make the following changes:

• Revise 356.12(7) as follows:

"In lengths longer than 1.8 m (6 ft) except for where a longer length is approved as essential for a required degree of flexibility or except for Type LFNC-B where secured in accordance with 356.30".

• Revise (4) as follows: "For a listed manufactured prewired assembly other than Type LFNC-B, metric designator 16 through 27 (trade size 1/2 through 1) conduit."
Substantiation: I agree with the panel's rejection of deleting Uses Permitted since this change does not add to the "user-friendliness" of the code as intended and since it is not being applied uniformly to all applicable articles. However, if the panel accepts the TCC public comment, these changes should be made.

The change in (7) is necessary because 356.10(5) only permits Type B for lengths longer than 6 feet.

The change in (4) is necessary because 356.10(6) only allows LFNC-B as a pre-wired assembly.

Panel Meeting Action: Accept
Panel Statement: The panel agrees with the submitter's recommendation to continue to reject.
See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-59 Log #3603 NEC-P08 **Final Action: Reject**
(356.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-104
Recommendation: CMP 8 should have Accepted or Accepted in Principle Proposal 8-104.
Substantiation: This Task Group was assembled per the request of the Technical Correlating Committee.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-60 Log #2458 NEC-P08 **Final Action: Reject**
(356.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-108
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:
"356.22 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 LFNC unless the cable article prohibits the installation in LFNC. 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 LFNC thereby prohibiting the compliance with these sections. Type AC cable cannot 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 LFNC thereby prohibiting the compliance with these sections. These cable types cannot 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 LFNC without meeting the securing and supporting requirements. Type SE cable cannot 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.

8-61 Log #2460 NEC-P08 **Final Action: Reject**
(356.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-107
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:
"356.22 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 LFNC unless the cable article prohibits the installation in LFNC. 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 LFNC thereby prohibiting the compliance with these sections. Type AC cable cannot 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 LFNC thereby prohibiting the compliance with these sections. These cable types cannot 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 LFNC without meeting the securing and supporting requirements. Type SE cable cannot 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.

8-62 Log #2086 NEC-P08 **Final Action: Reject**
(356.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-109
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

8-63 Log #136 NEC-P08 **Final Action: Accept in Principle**
(356.30(1))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-112
Recommendation: Move the new phrase, capitalizing it, setting it off with a comma, and putting it ahead of "the conduit".
Substantiation: From the present wording, I can't tell whether "longer than 1.8 m" applies only to the 300 mm rule or also to the 900 mm rule.
Panel Meeting Action: Accept in Principle
The panel agrees with the submitter and revises 356.30(1) to read as follows: "(1) Where installed in lengths exceeding 1.8 m (6 ft), the conduit shall be securely fastened at intervals not exceeding 900 mm (3 ft) and within 300 mm (12 in.) on each side of every outlet box, junction box, cabinet, or fitting."
Panel Statement: The revised text meets the intent of the submitter.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-64 Log #137 NEC-P08 **Final Action: Accept in Principle**
(356.30(1))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-112
Recommendation: Move the new phrase, setting it off with commas and putting it ahead of "within".
Substantiation: From the present wording, I can't tell whether "longer than 1.8 m" applies only to the 300 mm rule or also to the 900 mm rule.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel statement and action on Comment 8-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-65 Log #2062 NEC-P08 **Final Action: Accept in Principle**
(356.30(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-112
Recommendation: Accept the proposal in principle. Replace "when" with "where."
Substantiation: This is a Style Manual issue; the revised wording pertains to a condition of place and not time.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel statement and action on Comment 8-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-66 Log #2456 NEC-P08 **Final Action: Accept in Principle**
(356.30(1))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-112
Recommendation: Revise the proposed wording in item (1) of 356.30 to read as follows:
356.30 Securing and Supporting. Type LFNC-B shall be securely fastened and supported in accordance with one of the following:
(1) The conduit shall be securely fastened at intervals not exceeding 900 mm (3 ft) and within 300 mm (12 in.) on each side of every outlet box, junction box, cabinet, or fitting when installed in lengths ~~longer than~~ exceeding 1.8 m (6 ft).
(2) Securing and supporting of the conduit shall not be required where it is fished, installed in lengths not exceeding 900 mm (3 ft) at terminals where flexibility is required, or where installed in lengths not exceeding 1.8 m (6 ft) from a luminaire (fixture) terminal connection for tap conductors to luminaires (lighting fixtures) permitted in 410.67(C).
(3) Horizontal runs of LFNC supported by openings through framing members at intervals not exceeding 900 mm (3 ft) and securely fastened within 300 mm (12 in.) of termination points shall be permitted.
Substantiation: This is an editorial revision to comply with 3.2.2 of the Style Manual.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel statement and action on Comment 8-63.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-67 Log #2453 NEC-P08 **Final Action: Accept in Part**
(356.30(4) (New))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-114
Recommendation: Revise the proposed language to read as follows:
(4) Securing or supporting of LFNC-B shall not be required where installed in lengths not exceeding 1.8 m (6 ft) from the last point <u>where the raceway is securely fastened</u> of support for connections within an accessible ceiling to luminaire(s) [lighting fixture(s)] or other equipment.
Substantiation: The proposed language could be construed as permitting LFNC-B 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 LFNC-B 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 in Part
While the panel accepts the underlined text in the submitter's comment, the words "of support" shall be deleted.
Panel Statement: This is consistent with the panel's actions on Comments 8-28, 8-36, and 8-100.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-68 Log #70 NEC-P08 **Final Action: Accept**
(356.60)

Submitter: Michael V. Glenn, Longview Fibre Co.
Comment on Proposal No: 8-118
Recommendation: Reject this proposal.
Substantiation: The proposal to change equipment grounding conductor to equipment bonding conductor was rejected.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-69 Log #586 NEC-P08 **Final Action: Accept**
(358.10)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-122
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 358 — ELECTRICAL METALLIC TUBING: TYPE EMT

8-70 Log #2118 NEC-P08 **Final Action: Accept**
(358.10)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-122
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

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-71 Log #2364 NEC-P08 **Final Action: Accept in Principle**
(358.10)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-122

Recommendation: Revise text to read as follows:

358.10 Uses Permitted.

(A) Exposed and Concealed. The use of EMT shall be permitted for both exposed and concealed work.

(B) Corrosion Protection. Ferrous or nonferrous EMT, elbows, couplings, and fittings shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences where protected by corrosion protection and judged suitable for the condition.

(C) Wet Locations. All supports, bolts, straps, screws, and so forth shall be of corrosion-resistant materials or protected against corrosion by corrosion-resistant materials.

FPN: See 300.6 for protection against corrosion.

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.

See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-72 Log #3521 NEC-P08 **Final Action: Reject**
(358.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.

Comment on Proposal No: 8-122

Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-122.

Substantiation: This task group was assembled per the request of the TCC

Panel Meeting Action: Reject

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-73 Log #587 NEC-P08 **Final Action: Accept**
(358.12)

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 8-123

Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-74 Log #2119 NEC-P08 **Final Action: Accept**
(358.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America

Comment on Proposal No: 8-123

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

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-75 Log #2363 NEC-P08 **Final Action: Accept in Principle**
(358.12)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-123

Recommendation: Revise text to read as follows:

358.12 Uses Not Permitted. EMT shall not be used under the following conditions:

(1) Where, during installation or afterward, it will be subject to severe physical damage

(2) Where protected from corrosion solely by enamel

(3) In cinder concrete or cinder fill where subject to permanent moisture unless protected on all sides by a layer of noncinder concrete at least 50 mm (2 in.) thick or unless the tubing is at least 450 mm (18 in.) under the fill

(4) In any hazardous (classified) location except as permitted by 502.4, 503.3, and 504.20

(5) For the support of luminaires (fixtures) or other equipment except conduit bodies no larger what the largest trade size of the tubing

(6) Where practicable, dissimilar metals in contact anywhere in the system shall be avoided to eliminate the possibility of galvanic action

Exception: Aluminium fittings and enclosures shall be permitted to be used with steel EMT where not subject to severe corrosive influences.

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.

See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-76 Log #3282 NEC-P08 **Final Action: Accept**
(358.12)

Submitter: Elaine Thompson, Allied Tube & Conduit

Comment on Proposal No: 8-123

Recommendation: This proposal should continue to be rejected but if the Panel accepts the TCC comment, revise 358.12 as follow:

358-12 Uses Not Permitted. EMT shall not be used under the following conditions or in the following locations:

1. Where subject to severe physical damage.

2. In cinder concrete or cinder fill subject to permanent moisture unless protected on all sides by a layer of noncinder concrete at least 50 mm (2 in.) thick or unless the tubing is at least 450 mm (18 in.) under the fill.

3. Where contact with dissimilar metals produces the possibility of galvanc action.

Exception: Aluminum fittings and enclosures shall be permitted to be used with steel EMT where not subject to severe corrosive influences.

4. In severely corrosive environments unless protected in accordance with 300.6 and supplementary corrosion protection is used where required by the product listing.

Substantiation: I agree with the Panel's rejection of deleting Uses Permitted since this change does not add to the "user-friendliness" of the Code as intended and since it is not being applied uniformly to all applicable articles. However, if the Panel accepts the TCC public comment, these changes should be made.

The information in the NEC 2002 Uses Permitted for EMT, other than the permission to use it exposed or concealed, covers corrosion protection and wet locations. This is now covered in (4) of this proposed revision of Uses Not Permitted. The reference to 300.6 is in accordance with the Usability Task Group's directive to reduce repetitive language in the Code. All of the information concerning corrosion in protection and wet locations that was in the EMT "Uses Permitted" is contained in the current 300.6. This information is even more detailed in Proposal 3-51, a revision of 300.6 accepted by Panel 3. This revision separates corrosion protection requirements for ferrous and nonferrous raceways. Since EMT is available in ferrous and nonferrous materials, it is important to clarify the different requirements for each. This is accomplished in the revision of 300.6 and by checking the product listing requirements.

The current (2) in Uses Not Permitted covers enamel coated conduit. This has been deleted since it is covered in 300.6 and also because EMT that is protected solely by enamel is not available in the U.S. market.

The current (4) references only three sections from Chapter 5 hazardous locations. This has been deleted since numerous other references would have to be added and the material is already adequately covered in Chapter 5. Unfortunately, reference to an entire chapter is not permitted.

The current (5) covers the support of luminaires or other equipment except for conduit bodies. This information was deleted since it is covered in 314.23(E).

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

Panel Meeting Action: Accept

Panel Statement: The panel agrees with the submitter's recommendation to continue to reject.

See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-77 Log #3522 NEC-P08 **Final Action: Reject**
(358.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.

Comment on Proposal No: 8-123

Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-123.

Substantiation: This task group was assembled per the request of the TCC

Panel Meeting Action: Reject

Panel Statement: See the panel statement and action on Comment 8-54.

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

8-78 Log #2492 NEC-P08 **Final Action: Reject**
(358.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-126
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:

"358.22 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 EMT unless the cable article prohibits the installation in EMT. 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 EMT thereby prohibiting the compliance with these sections. Type AC cable cannot 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 EMT thereby prohibiting the compliance with these sections. These cable types cannot 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 EMT 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 EMT 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 EMT 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.

8-79 Log #2059 NEC-P08 **Final Action: Reject**
(358.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-127
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

8-80 Log #2065 NEC-P08 **Final Action: Accept in Principle**
(358.30)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-129
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

8-81 Log #2389 NEC-P08 **Final Action: Accept**
(358.30)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 8-129
Recommendation: The Proposal should be Accepted in Principle and reworded as follows:

EMT 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 358.30(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

8-82 Log #382 NEC-P08 **Final Action: Reject**
(358.30(A))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 8-75
Recommendation: Accept proposal.
Substantiation: Some Authorities Having Jurisdiction consider a connection to a coupling a termination just as at a conduit body. Present wording allows a 5 ft. unsupported length on each side of a coupling which may promote sagging or loose connections, especially where spanning open spaces. The Authority Having Jurisdiction should not have to rely on 110.12 or 110.13(A).
Panel Meeting Action: Reject
Panel Statement: As used in the substantiation of this comment, a coupling is not a termination point. Proposal 8-75 does not apply to 358.30(A).
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 360 — FLEXIBLE METALLIC TUBING: TYPE FMT

8-83 Log #588 NEC-P08 **Final Action: Accept**
(360.12)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-140
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. The Technical Correlating Committee notes that the Task Group may need to develop a comment to delete 360.10. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-84 Log #2362 NEC-P08 **Final Action: Accept in Principle**
(360.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-140
Recommendation: Revise text to read as follows:
360.12 Uses not Permitted. FMT shall not be used as follows:
(1) In hoistways
(2) In storage battery rooms
(3) In hazardous (classified) locations unless otherwise permitted under other articles in this Code
(4) Under ground for direct earth burial, or embedded in poured concrete or aggregate
(5) Where subject to physical damage
(6) In lengths over 1.8 m (6 ft)
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.
See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-85 Log #3523 NEC-P08 **Final Action: Accept**
(360.12)

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept" as indicated in the Comment on Negative Vote.
Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-140
Recommendation: CMP 8 should continue to reject Proposal 8-140 due to there is no companion proposal to handle Uses Permitted.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
LILLY: The panel action on Comment 8-85 should be to Accept, not Reject. The comment recommendation is to Reject Proposal 8-140. This is the same result by Panel 8 actions on Comments 8-54, 8-83 and 8-84. The result of these actions is to maintain the "Uses Permitted" and "Uses Not Permitted" sections.

LOYD: I agree with the negative comment by Mr. Lilly. It was the panel's intent to Reject Proposal 8-140 and this is the recommendation by the commenter, Mr. Burns, on Comment 8-85. Deleting the uses permitted does not make the code more user friendly. It will cause confusion in the industry.

Proposal 8-140 should be Rejected, and this will result in not changing the present text in the 2002 NEC.

WALBRECHT: I agree with Mr. Lilly that the panel action on Comment 8-85 should have been to Accept. The comment recommendation is to continue to Reject Proposal 8-140, and to maintain the "Uses Permitted" and "Uses Not Permitted" sections.

8-86 Log #2490 NEC-P08 **Final Action: Reject**
(360.22(A))

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-141
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:
"360.22 Number of Conductors.
(A) FMT - Metric Designators 16 and 21 (Trade Sizes 1/2 and 3/4). The number of conductors in metric designators 16 (trade size 1/2) and 21 (trade size 3/4) 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 FMT unless the cable article prohibits the installation in FMT. 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 FMT thereby prohibiting the compliance with these sections. Type AC cable cannot 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 FMT thereby prohibiting the compliance with these sections. These cable types cannot 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 FMT 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 FMT 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 FMT 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.

ARTICLE 362 — ELECTRICAL NONMETALLIC TUBING: TYPE EMT

8-86a Log #CC800 NEC-P08 **Final Action: Accept**
(362.10(5) Exception)

Submitter: Code-Making Panel 8
Comment on Proposal No: 8-150
Recommendation: Revise 362.10(5) Exception to read as follows:
"Exception: ENT shall be permitted to be used above suspended ceilings in buildings exceeding three floors above grade where the building is protected throughout by a fire sprinkler system installed in accordance with NFPA 13-1999, Standard for the Installation of Sprinkler Systems.
Substantiation: This revision addresses an editorial error as brought to the panel's attention in Proposal 8-150 and Comment 8-93.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-87 Log #589 NEC-P08 **Final Action: Accept**
(362.10(2) Exception)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-148
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal and accomplish their intended objective without a direct reference to the standard. The Standards Council decision during the 2002 NEC processing was related to the fact that the Technical Correlating Committee changed the reference after the comment stage had been completed. The panel has ample time and opportunity during this cycle to arrive at an acceptable solution and be in compliance with the NEC Style Manual. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the TCC to reconsider the proposal. The panel continues to reject the proposal. See panel action on Comment 8-88.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-89.

8-88 Log #2087 NEC-P08 **Final Action: Accept**
(362.10(2) Exception)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-148
Recommendation: Reject this proposal.
Substantiation: The current NEC language for 362.10(2) is a result of Comment 8-22 to the 2002 NEC, submitted by Joseph Zicherman, Representative of Carlon, Lamson & Sessions. After the Comment stage, the TCC changed the language by deleting the mandatory reference to NFPA 13, Standard for the *Installation of Sprinkler Systems*. The Panel statement to Comment 8-22 made it clear that the reference to NFPA 13 was necessary and that they were acting in accordance with recommendations from the NFPA Toxicity Technical Advisory Committee (TTAC). The TTAC had submitted Comment 8-24 in which they stated: *"Consideration should be given to sprinkler systems installed according to NFPA 13R for four story residential buildings.* ***The accumulation of C/D electrical products in non-combustible concealed spaces may become large enough to require sprinkler protection in those spaces."***

The Panel decided that the reference to NFPA 13 was necessary since that standard requires that most concealed spaces be sprinklered – NFPA 13R does not. Therefore, a general reference to a sprinkler standard or to requirements in the building code would not provide the degree or protection necessary since most ENT would be installed in concealed spaces.

When Comment 8-22 was appealed to the Standards Council, the Council clearly agreed with the Panel as noted in the Council's Decision D#01-16: *"By deleting this mandatory reference, the TCC arguably reduced the level of safeguard contemplated by the exception, and did so solely on the basis that it violates stylistic requirements in the Style Manual. The Council finds this to be an inadequate reason to reduce what the Panel determined to be a necessary safeguard."* They further stated: *"While this action may violate the NEC Style Manual, the Council believe in this instance, it is more important to achieve the technical result reached by the Panel than to require rigid adherence to the Style Manual."*

In his substantiation for this proposal, Mr. Kendall states that "the reference to NFPA 13 is not in accordance with the NEC Style Manual". However, the Standards Council has already upheld the Panel's right to use the reference.

In a public comment, the TCC has directed the panel to "arrive at an acceptable solution and be in compliance with the NEC Style Manual". Again, the Standards Council has already ruled that it is more important for the reference to be used than to comply with the Style Manual.

The Standards Council also stated in its Decision that they were *"referring the NEC Style Manual to the Council's task group on policies and procedures for a review and recommendation on the Section 4.2 prohibition of mandatory references and other issues, as it deems appropriate."* We have not heard or seen anything indicating that this has been accomplished.

Mr. Kendall's negative comment suggests that the NEC Style Manual could be revised to permit references to other standards in an Exception. This is in accord with the Standards Council Decision.

It is important that the reference to NFPA 13 be included in the mandatory "Exception" language. Putting the reference in a Fine Print Note does not accomplish the Panel's intent nor does it provide the necessary protection.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-89.

8-89 Log #2911 NEC-P08 **Final Action: Reject**
(362.10(2) Exception)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 8-148
Recommendation: This Proposal should be accepted.
Substantiation: This proposal should be Accepted. The reference is not in accordance with the NEC Style manual.
Panel Meeting Action: Reject
Panel Statement: The use of NFPA 13 is essential to the use of ENT in buildings above 3 stories as provided in 362.10(2) Exception. The mandatory use of NFPA 13 was the result of the Toxicity Advisory Committee Comment 8-24 to the 2002 NEC. The reference to the use of NFPA 13 was reviewed by the Standards Council and found to be necesssary and permitted to remain.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KENDALL: The reference to NFPA-13 is not in accordance with the NEC Style Manual.

8-90 Log #590 NEC-P08 **Final Action: Accept**
(362.10(5) Exception)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-150
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal and accomplish their intended objective without a direct reference to the standard. The Standards Council decision during the 2002 NEC processing was related to the fact that the Technical Correlating Committee changed the reference after the comment stage had been completed. The panel has ample time and opportunity during this cycle to arrive at an acceptable solution and be in compliance with the NEC Style Manual. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept

Panel Statement: The panel accepts the direction of the TCC to reconsider the proposal. The panel continues to reject the proposal. See panel action on Comment 8-91.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-89.

8-91 Log #2060 NEC-P08 **Final Action: Accept**
(362.10(5) Exception)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-150
Recommendation: Reject this proposal.
Substantiation: The current NEC language for 362.10(2) is a result of Comment 8-22 to the 2002 NEC, submitted by Joseph Zicherman, Representative of Carlon, Lamson & Sessions. After the Comment stage, the TCC changed the language by deleting the mandatory reference to NFPA 13, Standard for the *Installation of Sprinkler Systems*. The Panel statement to Comment 8-22 made it clear that the reference to NFPA 13 was necessary and that they were acting in accordance with recommendations from the NFPA Toxicity Technical Advisory Committee (TTAC). The TTAC had submitted Comment 8-24 in which they stated: *"Consideration should be given to sprinkler systems installed according to NFPA 13R for four story residential buildings.* ***The accumulation of C/D electrical products in non-combustible concealed spaces may become large enough to require sprinkler protection in those spaces."***

The Panel decided that the reference to NFPA 13 was necessary since that standard requires that most concealed spaces be sprinklered – NFPA 13R does not. Therefore, a general reference to a sprinkler standard or to requirements in the building code would not provide the degree or protection necessary since most ENT would be installed in concealed spaces.

When Comment 8-22 was appealed to the Standards Council, the Council clearly agreed with the Panel as noted in the Council's Decision D#01-16: *"By deleting this mandatory reference, the TCC arguably reduced the level of safeguard contemplated by the exception, and did so solely on the basis that it violates stylistic requirements in the Style Manual. The Council finds this to be an inadequate reason to reduce what the Panel determined to be a necessary safeguard."* They further stated: *"While this action may violate the NEC Style Manual, the Council believe in this instance, it is more important to achieve the technical result reached by the Panel than to require rigid adherence to the Style Manual."*

In his substantiation for this proposal, Mr. Kendall states that "the reference to NFPA 13 is not in accordance with the NEC Style Manual". However, the Standards Council has already upheld the Panel's right to use the reference.

In a public comment, the TCC has directed the panel to "arrive at an acceptable solution and be in compliance with the NEC Style Manual". Again, the Standards Council has already ruled that it is more important for the reference to be used than to comply with the Style Manual.

The Standards Council also stated in its Decision that they were *"referring the NEC Style Manual to the Council's task group on policies and procedures for a review and recommendation on the Section 4.2 prohibition of mandatory references and other issues, as it deems appropriate."* We have not heard or seen anything indicating that this has been accomplished.

Mr. Kendall's negative comment suggests that the NEC Style Manual could be revised to permit references to other standards in an Exception. This is in accord with the Standards Council Decision.

It is important that the reference to NFPA 13 be included in the mandatory "Exception" language. Putting the reference in a Fine Print Note does not accomplish the Panel's intent nor does it provide the necessary protection.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-89.

8-92 Log #2912 NEC-P08 **Final Action: Reject**
(362.10(5) Exception)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 8-150
Recommendation: This Proposal should be accepted.
Substantiation: This proposal should be Accepted. The reference is not in accordance with the NEC Style manual.
Panel Meeting Action: Reject
Panel Statement: The use of NFPA 13 is essential to the use of ENT in buildings above 3 stories as provided in 362.10(5) Exception. The mandatory use of NFPA 13 was the result of the Toxicity Advisory Committee Comments 8-24 to the 2002 NEC. The reference to the use of NFPA 13 was reviewed by the Standards Council and found to be necesssary and permitted to remain.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
KENDALL: See my Explanation of Negative Vote on Comment 8-89.

8-93 Log #2913 NEC-P08 **Final Action: Reject**
(362.10(5) Exception)

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 8-150
Recommendation: This Proposal should be accepted. If not, the following text revision to the current language should be implemented as indicated in the original proposal:

(5) Above suspended ceilings where the suspended ceilings provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies, except as permitted in 362.10(1)(a).

Exception: ENT shall be permitted to be used above suspended ceilings in buildings exceeding three floors above grade ~~W~~where the building is protected throughout by a fire sprinkler system~~(s)~~ is installed in accordance with NFPA 13–1999, Standard for the Installation of Sprinkler Systems~~, on all floors, ENT is permitted to be used within walls, floors, and ceilings, exposed or concealed, in buildings exceeding three floors above grade~~.
Substantiation: The revised text clarifies that this exception permits ENT to be installed above a suspended ceiling without a 15 minute finish rating. The current text in 362.10(5) should reference suspended ceilings, instead it applies to applications found in 362.10(2) that addresses walls and concealed ceilings.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-92 and panel Comment 8-86a.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-94 Log #2066 NEC-P08 **Final Action: Accept in Principle**
(362.12(4))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-151
Recommendation: Accept the proposal in principle. Simplify the language, as follows:

(4) For conductors or cables operating at a temperature higher than the ENT listed temperature rating.
Substantiation: The panel action creates a wonderful example of exactly what the exception reform movement was trying to eliminate: exceptions that are so general they amount to an editorial contrivance to complete a thought. The proposed exception applies to all cables and conductors at all voltages under all degrees of supervision. As such, it is not an alternative to a basic code rule; it effectively becomes the code rule. This comment avoids the use of the exception entirely with simple, positive text that will not be understood.
Panel Meeting Action: Accept in Principle

Revise proposed text in comment to read:"(4) For conductors or cables operating at a temperature higher than the ENT-listed operating temperature rating."
Panel Statement: The panel agrees with the submitter that an exception should not be used. "Operating" was added to clarify that the conductors or cables cannot be operated above the ENT listed operating temperature. This will prevent confusion with the ENT-listed ambient temperature.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
DABE: The submitter's text is more likely to be misinterpreted or overlooked than the text in the Report on Proposals.

8-95 Log #2485 NEC-P08 **Final Action: Reject**
(362.22)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-156
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:

"362.22 Number of Conductors.

The number of conductors shall not exceed that permitted by the percentage fill in Table 1, Chapter 9.

Cables shall be permitted ~~not prohibited~~ to be installed where such use is 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 ENT unless the cable article prohibits the installation in ENT. 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 ENT 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 ENT 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 ENT 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 ENT 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 ENT 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.

8-96 Log #2487 NEC-P08 **Final Action: Reject**
(362.22)

Submitter: Wayne A. Lilly Bridgewater, VA

Comment on Proposal No: 8-155

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:

"362.22 Number of Conductors.

The number of conductors shall not exceed that permitted by the percentage fill in Table 1, Chapter 9. Cables shall be permitted ~~not prohibited~~ to be installed where such use is 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 ENT unless the cable article prohibits the installation in ENT. 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 ENT thereby prohibiting the compliance with these sections. Type AC cable cannot 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 ENT thereby prohibiting the compliance with these sections. These cable types cannot 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 ENT without meeting the securing and supporting requirements. Type SE cable cannot 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 ENT 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 ENT 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.

8-97 Log #2489 NEC-P08 **Final Action: Reject**
(362.22(A))

Submitter: Wayne A. Lilly Bridgewater, VA

Comment on Proposal No: 8-142

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:

"360.22 Number of Conductors.

(A) FMT - Metric Designators 16 and 21 (Trade Sizes 1/2 and 3/4). The number of conductors in metric designators 16 (trade size 1/2) and 21 (trade size 3/4) 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 FMT unless the cable article prohibits the installation in FMT. 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 FMT thereby prohibiting the compliance with these sections. Type AC cable cannot 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 FMT thereby prohibiting the compliance with these sections. These cable types cannot 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 FMT 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 FMT 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 FMT 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.

8-98 Log #2088 NEC-P08 **Final Action: Reject**
(362.24)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-157
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

8-99 Log #2390 NEC-P08 **Final Action: Accept**
(362.30)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 8-158
Recommendation: The Proposal should be Accepted in Principle and reworded as follows:
ENT 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 362.30(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

8-100 Log #2482 NEC-P08 **Final Action: Accept**
(362.30(A) Exception No. 2)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 8-162
Recommendation: Revise the proposed language to read as follows:
Exception No. 2: 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 ENT to be installed in lengths just under 9 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 3 ft permitted by the general rule plus the 6 ft permitted by the exception. No substantiation has been submitted to demonstrate the suitability of ENT 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

ARTICLE 366 — AUXILIARY GUTTERS

8-101 Log #1030 NEC-P08 **Final Action: Accept**
(366)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-167a
Recommendation: This proposal should continue to be accepted - in particular those portions that incorporate Proposals 8-170 and 8-171.
Substantiation: Proposals 8-170 and 8-171 will help resolve significant inconsistencies in code language and interpretation. These proposals have been incorporated into the rewrite of Article 366 and this rewrite should remain as accepted.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-102 Log #2070 NEC-P08 **Final Action: Reject**
(366)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-167a
Recommendation: Accept the proposal in principle. Accept the text as proposed except for the following revisions:
1. In 362.2 restructure the section to have common language for all wireways, as follows:
362.2 Definition.
Auxiliary Gutter. One or more enclosures used to supplement wiring spaces at meter centers, distribution centers, switchboards, and similar points of wiring systems. The enclosures have hinged or removable covers for housing and protecting electric wires, cable and busbars. The enclosures are designed for conductors to be laid or set in place after the enclosures have been installed as a complete system. Auxiliary gutters are manufactured in both metal and nonmetallic styles.
2. In 366.10 delete the first sentence.
3. In 366.10(A)(2) insert "identified as" before the word "suitable".
4. In 366.10(B) delete all text after the title.
5. In 366.10(B)(1) change the text to read "Nonmetallic auxiliary gutters shall be permitted to be installed outdoors where listed and marked in accordance with 366.6(A) and 366.120(A)."
6. In 366.12(2), delete the exception.
7. In 366.12, delete the FPN.
8. In 366.120(A)(3), revise as follows "…installed conductor insulation operating temperature ~~rating~~."
9. In 366.120(B), revise as follows: "… shall be marked with the installed conductor insulation operating temperature ~~rating~~." Delete 366.120(B)(1).
Substantiation: 1. The proposed text is not a complete definition of either type of gutter; it is more a definition of wireway styles because it lacks the critical information in 366.10. In fact, the proposed text even uses the term "wireway" within the definitions, which would increase field confusion between the two wiring methods. Remember, wireways and gutters are manufactured to the same product standard. Only the field use differentiates the two. And the text in 366.10 provides the basis for the field use distinction. Therefore, to make the definitions meaningful, this comment incorporates the text in the proposed 366.10, which is common for all auxiliary gutters, into the definition. The syntax has been changed so it works as a definition instead of a rule. Because all of this applies to both gutter styles, the definition becomes unified, with a concluding sentence describing the two styles.
2. Since this sentence is now part of the definition, it comes out of this location.
3. Editorial; this substitutes a defined term in Article 100 for an imprecise term frowned on in the Style Manual. The term was intentionally selected to avoid the term "listed."
4. This text is completely redundant [see 366.6(A)(3), 366(B), 366.120(A)(1) and (2)].
5. The text proposed in this comment is generic parent text for what follows. Note that the text in the proposal requires a specific listing for outdoor use, as opposed to listing for wet locations and sunlight exposure. This conflicts with 366.6(A) and there is no technical substantiation to support it. The submitter assumes this is an error because the only requirements in the 2002 NEC are carried forward in 366.6(A) and 366.120(A). If it is not, then the requirement should be located in 366.6(A) as parent language ["… installed outdoors shall be listed for outdoor exposure and shall be:"]
6. This exception violates the Style Manual because the subject is completely addressed by 90.3.
7. This FPN contains three violations of the whole article prohibition in the Style Manual, and adds little to understanding. It probably cannot and should not be saved.
8. This rewording is for the sake of consistency with other proposals the panel has accepted that allow nonmetallic raceways to relate to conductor operating temperatures instead of insulation temperature ratings.
9. Same as item 8. In addition this comment, by moving (1) into the parent text, avoids the syntax error of a numbered list containing a single item.
Panel Meeting Action: Reject
Panel Statement: The proposed changes are inconsistent with the text proposed by the panel in the rewrite, and the panel does not agree with the submitter that additional revisions are needed.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 368 — BUSWAYS

8-103 Log #135 NEC-P08 **Final Action: Reject**
(368.3)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-176
Recommendation: Accept proposal as worded.
Substantiation: If I were inspecting a busway installation, I sure wouldn't have a clue to its suitability unless it were listed. Even if it were, I might well need to talk to the NRTL.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its position that it is not the intent of the panel to require the listing of busways, and the submitter did not provide sufficient substantiation for a listing requirement.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
DABE: I support the concept of third party listing. The listing of busways and associated fittings would ensure that they are safe for their intended use. There may need to be some allowance for unusual field conditions. Standard length of busway should be required to be listed.
LILLY: Although many busway installations are made utilizing listed busway, the requirement for listing is not mandatory. The authority having jurisdiction is charged with determining the suitability of equipment for a given installation. The AHJ is not in a position to judge busways for items such as voltage ratings, withstand ratings, current ratings, or suitability for indoor or outdoor use. Requiring all busways and their associated fittings to be listed would address these issues.
WALBRECHT: The original submitter or Proposal 8-176 is correct in the substantiation. The Authority Having Jurisdiction will not have the means available to determine the safety of the design, manufacture, and installation of a busway. Busways and their associated fittings, as with a wiring method, should be evaluated and listed by a nationally recognized third party certification organization. Field fabrication and modification of factory-produced components can also be hazardous and should be properly examined and evaluated by a nationally recognized testing organization.

8-104 Log #3646 NEC-P08 **Final Action: Reject**
(368.3)

Submitter: W. Creighton Schwan Hayward, CA
Comment on Proposal No: 8-176
Recommendation: Add: "368.3 Listing Requirements. Busways and their associated fittings shall be listed."
Substantiation: By rejecting this proposal, Panel 8 is placing an onerous burden on the AHJ, who has not the means to certify as to the suitability of busways installed in his jurisdiction. The listing by a third party is necessary.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-103.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 10 Negative: 3
Explanation of Negative:
DABE: See my Explanation of Negative Vote on Comment 8-6.
LILLY: See my Explanation of Negative Vote on Comment 8-103.
WALBRECHT: See my Explanation of Negative Vote on Comment 8-103.

8-105 Log #1950 NEC-P08 **Final Action: Reject**
(368.8(B) Exception)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 8-183
Recommendation: The proposal should be accepted.
Substantiation: The submitter raises legitimate concerns. Who maintains the wiring in this case has little bearing on the day-to-day abuse these installations take. The general provisions without the exception applied would clearly provide for a safer installation in this case. This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Reject
Panel Statement: There was no further technical substantiation to demonstrate a need to delete this exception when appropriately applied.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
DABE: The submitter's comments are legitimate concerns and the exception to use cord with no limit on the length of the cord is a case where cord is being used as a substitute for fixed wiring of a structure. Cord should not be permitted as a substitute for a Chapter Three wiring method.

8-106 Log #3647 NEC-P08 **Final Action: Reject**
(368.8(B) Exception)

Submitter: W. Creighton Schwan Hayward, CA
Comment on Proposal No: 8-183
Recommendation: Reconsider, and accept proposal to delete 368-8(B) Exception.
Substantiation: The existing wording weakens the Code, and places an unacceptable burden on the AHJ. To expect the AHJ to judge that all of the maintenance personnel on a property meet the definition of "Qualified Person" in Article 100 is an onerous charge, and even if it could be done, considering the frequency of personnel changes in the usual industrial occupancy, it is an impossible task for the AHJ to continuously monitor the qualifications of the maintenance personnel.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-105.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
DABE: See my Explanation of Negative Vote on Comment 8-105.

8-107 Log #1245 NEC-P08 **Final Action: Reject**
(368.8(B)(2) Exception)

Submitter: Charles M. Trout, Maron Electric Co. Inc.
Comment on Proposal No: 8-183
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 to use. The only way to appropriately apply this exception is to provide prescriptive requirements that the Authority Having Jurisdiction can use to enfore the intent.
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: Identification of qualified persons is defined in Article 100, and appropriate work practices are addressed in NFPA 70E.

Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
DABE: See my Explanation of Negative Vote on Comment 8-105.

8-108 Log #2072 NEC-P08 **Final Action: Reject**
(368.10(A)and (B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-172a
Recommendation: Accept the proposal in principle. Re-title 368.10(A) and (B) from "Exposed" and "Concealed" to "In View" and "Out of View."
Substantiation: These terms are not used in accordance with Article 100 definitions. "Exposed" includes behind hung ceiling access panels, and "Concealed" essentially means not closed in by structure. This comment provides correct terminology that does not conflict with the applicable provisions.
Panel Meeting Action: Reject
Panel Statement: The terms "Exposed" and "Concealed" more closely represent the terminology used within this article. The terms "In View" and "Out of View" are not used in the NEC and would not add significant clarity.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
DABE: The submitter's comment should have been Accepted, the clarified text aides in providing clearer code. The text in 368.10 is clear. "Exposed", as used in 368.10, means it is located in the open and visible as opposed to the definition in Article 100, which is stated as: "Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access."

ARTICLE 370 — CABLEBUS

8-109 Log #134 NEC-P08 **Final Action: Reject**
(370.7(4))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-197
Recommendation: Accept as proposed, with the deletion of the additional word "physical."
Substantiation: Whether as inspector or contractor, I wouldn't want to be in the position of assessing, or arguing, the severity of potential damage. Would you? There is no reason to treat this differently than Proposal 15-86. As for the word "physical," it adds no information, and we want to eliminate gratuitous wording.
Panel Meeting Action: Reject
Panel Statement: The term "physical" adds clarity to the type of potential damage which may occur in installations.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 372 — CELLULAR CONCRETE FLOOR RACEWAYS

8-110 Log #2074 NEC-P08 **Final Action: Reject**
(372.17 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-202
Recommendation: Reject the proposal.
Substantiation: For good reason, the underfloor raceway articles forbid the reinsulation of conductors at abandoned outlets. However, the present Code builds in a powerful economic incentive to violate these rules. This is because 310.15(B)(2)(a) complicates the simple solution to the problem. Although the mutual conductor derating rules actually apply regardless of whether this proposal is accepted, the panel action sends the wrong message to CMP 6.

The best solution to the built-in incentive for re-insulating wires is to use one pair of conductors for each outlet, spliced in a header duct of some kind. Then if an outlet is to be abandoned, the pair of wires can be simply withdrawn with a pull wire left in place for the future. Although this can be done now, the literal effect of 310.15(B)(2)(a) is to require oversized conductors on many runs, which needlessly discourages the practice. In fact, with generally small loads split up over many pairs of wires, or even a large load using only one pair of wires in a group, there is no problem. These raceways are large in area and well embedded in an excellent "heat sink" medium. Massachusetts has made this exception for the last seven editions of the Code without incident, albeit with a wireway-style fill limitation (not over 30 current-carrying conductors at any cross-section).

The proposal should be rejected for now and CMP 8 should consider modifying the application of 310.15(B)(2)(a) along these lines in the 2008 cycle. After all, if these installations overheat, then the wireways would also. One of these metal raceways embedded in a concrete floor would be very unlikely to cause a problem for the enclosed conductors based on standard usage patterns and similarities with other raceways of comparable cross section. No harm will be done because the derating penalties apply anyway until and unless the code is changed.
Panel Meeting Action: Reject
Panel Statement: The submitter's substantiation accurately points out that 310.15(B)(2) applies to this section regardless of acceptance in this article. However, the panel reaffirms the necessity to include the proposed reference to ensure the appropriate application of cellular concrete floor raceway as outlined by the original proposal.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-111 Log #2076 NEC-P08 **Final Action: Reject**
(372.17 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-204
Recommendation: Accept the proposal in part. Accept only the relocation of 372.12. Reject the remainder.
Substantiation: For good reason, the underfloor raceway articles forbid the reinsulation of conductors at abandoned outlets. However, the present Code builds in a powerful economic incentive to violate these rules. This is because 310.15(B)(2)(a) complicates the simple solution to the problem. Although the mutual conductor derating rules actually apply regardless of whether this proposal is accepted, the panel action sends the wrong message to CMP 6.

The best solution to the built-in incentive for re-insulating wires is to use one pair of conductors for each outlet, spliced in a header duct of some kind. Then if an outlet is to be abandoned, the pair of wires can be simply withdrawn with a pull wire left in place for the future. Although this can be done now, the literal effect of 310.15(B)(2)(a) is to require oversized conductors on many runs, which needlessly discourages the practice. In fact, with generally small loads split up over many pairs of wires, or even a large load using only one pair of wires in a group, there is no problem. These raceways are large in area and well embedded in an excellent "heat sink" medium. Massachusetts has made this exception for the last seven editions of the Code without incident, albeit with a wireway-style fill limitation (not over 30 current-carrying conductors at any cross-section).

The proposal should be rejected for now and CMP 8 should consider modifying the application of 310.15(B)(2)(a) along these lines in the 2008 cycle. After all, if these installations overheat, then the wireways would also. One of these metal raceways embedded in a concrete floor would be very unlikely to cause a problem for the enclosed conductors based on standard usage patterns and similarities with other raceways of comparable cross section. No harm will be done because the derating penalties apply anyway until and unless the code is changed.
Panel Meeting Action: Reject
Panel Statement: The submitter's substantiation accurately points out that 310.15(B)(2) applies to this section regardless of acceptance in this article. However, the panel reaffirms the necessity to include the proposed reference to ensure the appropriate application of cellular metal floor raceway as outlined by the original proposal. The panel understands that the submitter's reference should have been 374.17.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 376 — METAL WIREWAYS

8-112 Log #3648 NEC-P08 **Final Action: Reject**
(376.6)

Submitter: W. Creighton Schwan Hayward, CA
Comment on Proposal No: 8-208
Recommendation: Add: 376.6 Listing Requirements. Metal wireways and associated fittings shall be listed.
Substantiation: The panel statement says the use of wireway as an equipment grounding conductor is addressed in 250.118(14). That is true, but if you READ 250.118(14) you will see that it speaks of LISTED wireways.
Panel Meeting Action: Reject
Panel Statement: The recommendation is overly restrictive and the substantiation is insufficient to require the listing of all metal wireway and associated fittings. The use of metal wireway as an equipment grounding conductor is addressed in 250.118(14), and metal wireway must be listed when used as an equipment grounding conductor.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 11 Negative: 2
Explanation of Negative:
DABE: I support the concept of third party listing. 378.6 currently requires nonmetallic wireways to be listed. The listing of metal wireways and associated fittings would insure that they are safe for their intended use.

WALBRECHT: The original submitter or Proposal 8-208 is correct in the substantiation. The Authority Having Jurisdiction will not have the means available to determine the safety of the design, manufacture, and installation of a metal wireway. Wireways and their associated fittings, as with a wiring method, should be evaluated and listed by a nationally recognized third party

certification organization. Field fabrication and modification of factory-produced components can also be hazardous and should be properly examined and evaluated by a nationally recognized testing organization.

8-113 Log #591 NEC-P08 **Final Action: Accept**
(376.10)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-209
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-114 Log #1991 NEC-P08 **Final Action: Reject**
(376.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-209
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-209.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-115 Log #2122 NEC-P08 **Final Action: Accept**
(376.10)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-209
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
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-116 Log #2361 NEC-P08 **Final Action: Accept in Principle**
(376.10)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-209
Recommendation: Revise text to read as follows:

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

(1) For exposed work
(2) In concealed spaces as permitted in 376.10(4)
(3) In hazardous (classified) locations as permitted by 501.4(B) for Class I, Division 2 locations; 502.4(B) for Class II, Division 2 locations; and 504.20 for intrinsically safe wiring. Where installed in wet locations, wireways shall be listed for the purpose.
(4) As extensions to pass transversely through walls if the length passing through the wall is unbroken. Access to the conductors shall be maintained on both sides of the wall.

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.

See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-117 Log #3524 NEC-P08 **Final Action: Reject**
(376.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-209
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-209.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-118 Log #592 NEC-P08 **Final Action: Accept**
(376.12)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-210
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-119 Log #1993 NEC-P08 **Final Action: Reject**
(376.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-210
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-210.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-120 Log #2124 NEC-P08 **Final Action: Accept**
(376.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-210
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
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-121 Log #2360 NEC-P08 **Final Action: Accept in Principle**
(376.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-210
Recommendation: Revise text to read as follows:

376.12 Uses Not Permitted. Metal wireways shall not be used in the following:

(1) Where subject to severe physical damage
(2) Where subject to severe corrosive environments

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.

See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-122 Log #3525 NEC-P08 **Final Action: Reject**
(376.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-210
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-210.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-123 Log #133 NEC-P08 **Final Action: Reject**
(376.12(1))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-211
Recommendation: Accept as proposed, with the deletion of the additional word "physical."
Substantiation: Whether as inspector or contractor, I wouldn't want to be in the position of assessing, or arguing, the severity of potential damage. Would you? There is no reason to treat this differently than Proposal 15-86. As for the word "physical," it adds no information, and we want to eliminate gratuitous wording.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-109.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-124 Log #132 NEC-P08 **Final Action: Reject**
(376.12(2))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-212
Recommendation: Accept as proposed, with the deletion of the additional word "physical."
Substantiation: Whether as inspector or contractor, I wouldn't want to be in the position of assessing, or arguing, the severity of potential damage. Would you? There is no reason to treat this differently than Proposal 15-86. As for the word "physical," it adds no information, and we want to eliminate gratuitous wording.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-109.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-125 Log #1031 NEC-P08 **Final Action: Accept**
(376.23(A))

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-214
Recommendation: This proposal should continue to be accepted.
Substantiation: This proposal will help resolve a significant inconsistency in code language and interpretation. The literal language of the code currently provides a rule that does not make sense, but that issue should be resolved in the reference to 312.6 here in Article 376 rather than in 312.6 itself. This proposal, in conjunction with Proposal 8-217, which should also be accepted, will clarify when the number of conductors per terminal should actually be considered in sizing wireways.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-126 Log #593 NEC-P08 **Final Action: Accept**
(376.56)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-217
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-128.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-127 Log #1032 NEC-P08 **Final Action: Accept**
(376.56)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-217
Recommendation: This proposal should be accepted.
Substantiation: The current language does not prohibit this type of installation, but more specific language should be provided. (paragraph) As noted in the substantiation, the use of power distribution blocks in wireways is consistent with the listing of these products. The panel comment was that exposed live parts are not appropriate in wireways, but Article 376 does not prohibit such an installation. (376.56 does not say anything about the permitted splices and taps being insulated.) Power distribution blocks are a much safer way to make taps in a wireway than many other "traditional" methods, especially where additonal taps are likely to be needed in the future. The proposed language will also clarify, in concert with Proposal 8-214, when the number of conductors per terminal should actually be considered in sizing wireways, and the current language in Article 376 is deficient in this respect.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-128.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-128 Log #1606 NEC-P08 **Final Action: Accept in Principle**
(376.56)

Submitter: Jim Pauley, Square D Company
Comment on Proposal No: 8-217
Recommendation: Accept the proposal.
Substantiation: While I appreciate the concern of the panel expressed in the panel statement, the horse already appears to be out of the barn. There is no specific prohibition in Article 376 relative to live parts inside of a wireway. There is no prohibition in the wireway (UL 870) product standard. The UL outline of investigation for power distribution blocks (Subject 1953) already says that they can be used in wireways.
Given those facts, not adding some wording to Article 376 simply allows the installations to continue without any parameters. The proposal at least provides for some basic rules like listing of the blocks and wire bending space. It is not uncommon to find a power distribution block inside of a wireway used for multiple disconnects. It makes for a much cleaner installation to use a distribution block to tap off to the multiple disconnects than it does to use split-bolts.
Panel Meeting Action: Accept in Principle
Accept Proposal 8-217 as submitted with the addition of a new Number (4) to Section (B) to read as follows:"(4) Live Parts.
Power distribution blocks shall not have exposed live parts in the wireway after installation."
Panel Statement: The proposed language in the proposal was accepted to meet the submitter's intent. The addition of (4) addresses the panel's concerns for incidental contact with live parts.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-129 Log #2078 NEC-P08 **Final Action: Accept**
(376.56)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-217
Recommendation: Accept the proposal.
Substantiation: Power distribution blocks are permitted by the existing code in 376.56, since all they are is a somewhat more elaborate mechanism for making a splice or tap. This is the reason they are routinely installed and accepted. The proposal is helpful because it will make enforcement consistent and it will add important safety restrictions that are not in place at this time.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-128.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 378 — NONMETALLIC WIREWAYS

8-130 Log #594 NEC-P08 **Final Action: Accept**
(378.10)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-220
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed

that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment. The Technical Correlating Committee notes that the Task Group may need to develop a comment to revise 378.12.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-131 Log #2359 NEC-P08 **Final Action: Accept in Principle**
(378.10)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-220
Recommendation: Revise text to read as follows:
378.10 Uses Permitted. The use of nonmetallic wireways shall be permitted in the following:
(1) Only for exposed work, except as permitted in 378.10(4).
(2) Where subject to corrosive environments where identified for the use.
(3) In wet locations where listed for the purpose.
FPN: Extreme cold may cause nonmetallic wireways to become brittle and therefore more susceptible to damage from physical contact.
(4) As extensions to pass transversely through walls if the length passing through the wall is unbroken. Access to the conductors shall be maintained on both sides of the wall.
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!
I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.
CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.
See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-132 Log #865 NEC-P08 **Final Action: Accept**
(378.23)

Submitter: Jamie McNamara Hastings, MN
Comment on Proposal No: 8-221
Recommendation: Revise 3738.23(A) as shown below:
(A) Deflected Insulated Conductors. Where insulated conductors are deflected within a ~~metallic~~ nonmetallic wireway, either at the ends or where conduits, fittings, or other raceways or cables enter or leave the ~~metallic~~ nonmetallic wireway, or where the direction of the ~~metallic~~ nonmetallic wireway is deflected greater than 30 degrees, dimensions corresponding to one wire per terminal in Table 312.6(A) shall apply.
Substantiation: 378 is on nonmetallic wireways.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-133 Log #1033 NEC-P08 **Final Action: Accept**
(378.23(A))

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 8-221
Recommendation: This proposal should continue to be accepted.
Substantiation: This proposal is consistent with Proposal 8-214 which was, and should be, accepted.
Panel Meeting Action: Accept
Panel Statement: See panel action on Comment 8-132.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 380 — MULTIOUTLET ASSEMBLY

8-134 Log #595 NEC-P08 **Final Action: Accept**
(380.2)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-229
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-135 Log #1995 NEC-P08 **Final Action: Reject**
(380.2)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-229
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-229.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-136 Log #3526 NEC-P08 **Final Action: Reject**
(380.2)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-229
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-229.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-137 Log #1914 NEC-P08 **Final Action: Accept in Principle**
(380.2(A))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-229
Recommendation: Revise text to read as follows:
380.2 Use.
(A) Permitted. The use of a multioutlet assembly shall be permitted in dry locations.
(B) Not Permitted. A multioutlet assembly shall not be installed as follows:
(1) Where concealed, except that it shall be permissible to surround the back and sides of a metal multioutlet assembly by the building finish or recess a nonmetallic multioutlet assembly in a baseboard
(2) Where subject to severe physical damage
(3) Where the voltage is 300 volts or more between conductors unless the assembly is of metal having a thickness of not less than 1.02 mm (0.040 in.)
(4) Where subject to corrosive vapors
(5) In hoistways
(6) In any hazardous (classified) locations except Class I, Division 2 locations as permitted in 501.4(B)(3)
Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?

CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged.
See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-138 Log #2358 NEC-P08 **Final Action: Accept in Principle**
(380.2(A))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-229
Recommendation: Revise text to read as follows:
380.2 Use.
(A) Permitted. The use of a multioutlet assembly shall be permitted in dry locations.
(B) Not Permitted. A multioutlet assembly shall not be installed as follows:
(1) Where concealed, except that it shall be permissible to surround the back and sides of a metal multioutlet assembly by the building finish or recess a nonmetallic multioutlet assembly in a baseboard
(2) Where subject to severe physical damage
(3) Where the voltage is 300 volts or more between conductors unless the assembly is of metal having a thickness of not less than 1.02 mm (0.040 in.)
(4) Where subject to corrosive vapors
(5) In hoistways
(6) In any hazardous (classified) locations except Class I, Division 2 locations as permitted in 501.4(B)(3)
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-139 Log #3654 NEC-P08 **Final Action: Reject**
(380.2(A))

Submitter: Stephen W. McCluer, American Power Conversion Corp

Comment on Proposal No: 8-230

Recommendation: Revise and add new subparagraph:

(1) In dry locations

(2) When mounted inside equipment used to terminate utilization equipment listed as information technology equipment as permitted in Article 645, provided that the multi-outlet assembly is recognized for the purpose and the overall device in which it is mounted is listed for the application by a nationally recognized testing laboratory. Where more than one multioutlet assembly is installed, the assemblies shall be marked to identify their source.

Substantiation: The Panel states that this general purpose wiring method should not pertain to products used within equipment. I agree. But this proposal was submitted precisely because of experience with inspectors who do not agree with the panel. This proposal would eliminate such confusion.

Panel Meeting Action: Reject

Panel Statement: The panel reaffirms that Article 380 is a general-purpose wiring method and should not pertain to products used within equipment. Requirements in Article 645 modify or amend the rules in Chapters 1 through 4.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-140 Log #131 NEC-P08 **Final Action: Reject**
(380.2(B)(2))

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

Comment on Proposal No: 8-231

Recommendation: Accept as proposed, with the deletion of the additional word "physical."

Substantiation: Whether as inspector or contractor, I wouldn't want to be in the position of assessing, or arguing, the severity of potential damage. Would you? There is no reason to treat this differently than Proposal 15-86. As for the word "physical," it adds no information, and we want to eliminate gratuitous wording.

Panel Meeting Action: Reject

Panel Statement: See panel statement and action on Comment 8-109.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

(Note: The sequence no. 8-141 was not used)

17-2d Log #3053 NEC-P17 **Final Action: Reject**
(380.21(A)(6))

Submitter: Linda J. Little St. Louis, MO

Comment on Proposal No: 17-77

Recommendation: Recommendation: The panel should have accepted this proposal.

Substantiation: This proposal would reinstate the 1999 Code language requiring GFCI protection on single phase hard-wired pump motors. This is an important safety issue that should be considered.

Receptacle fed pump motors are already required to be GFCI protected. Hard-wired circuits are intended for the same application - to feed pump motors; the same hazards are present. The original requirement for permanently connected pool pump motors to be GFCI protected was based on an OSHA report of an investigation conducted after a 17-year-old female was electrocuted when she contacted an ungrounded electric motor (See http://www.cdc.gov/niosh/face/In-house/full8835.html). An operating GFCI would have prevented this fatality. Therefore, the panel accepted the proposal to protect all pool motors whether hard wired or cord and plug connected. No justification was provided to remove the requirement for GFCI protection on pool pump motors that are hard wired from the 2002 NEC.

Safety of the user over the life of the pool must be a priority. It is inevitable that a hard-wired pump motor will eventually be disconnected. The seal on pump has a limited life because chlorine causes it to corrode. Changing the seal requires disconnecting the electric supply in order to remove the motor bolts and the pump housing. Hard-wiring may also be disconnected for winterizing purposes. Because the connection is not permanent, there is a greater likelihood of problems. The cost of providing GFCI protection is minimal with respect to the cost of a pool. Any individual in the area of a swimming pool has the right to expect this added measure of safety.

The U.S. Consumer Product Safety Commission (CPSC) in a recent Safety Alert (See http://www.cpsc.gov/cpscpub/pubs/5039.html) states that the CPSC is aware of more than a dozen electrocutions and a similar number of electrical shock incidents involving circuits around swimming pools between 1997 and 2002. The CPSC urges consumers to have a qualified electrician install GFCI protection "for all pool, spa, and hot tub electrical equipment and for underwater swimming pool lighting fixtures." They do not make an exception or distinction for hard-wired equipment.

I agree with the explanation of negative as written by Mr. Pearse and Mr. Yasenchak. I disagree with the panel action and panel statement and assert that sufficient technical substantiation does exist to warrant GFCI protection on all pool pump motors. This technical substantiation, coupled with the fact that the Manufacturer's installation instructions recommend GFCI protection for swimming pool pump motors justify the proposal and the CMP gave no substantiation whatsoever for the removal of this requirement in the last cycle.

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

Panel Meeting Action: Reject

Panel Statement: See panel action and statement on Comment 17-117.

Number Eligible to Vote: 9

Ballot Results: Affirmative: 7 Negative: 2

Explanation of Negative:

ROCK: GFCI protection of hard-wired pump motors required in the 1999 NEC provides needed safety and the requirements should be reinstated in the 2005 NEC.

YASENCHAK: See my Explanation of Negative Vote on Comment 17-117.

ARTICLE 384 — STRUT-TYPE CHANNEL RACEWAY

8-142 Log #596 NEC-P08 **Final Action: Accept**
(384.10)

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 8-234

Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-143 Log #1916 NEC-P08 **Final Action: Accept in Principle**
(384.10)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-234

Recommendation: Revise text to read as follows:

384.10 Uses Permitted. The use of strut-type channel raceways shall be permitted in the following:

(1) Where exposed.

(2) In dry locations.

(3) In locations subject to corrosive vapors where protected by finishes judged suitable for the condition.

(4) Where the voltage is 600 volts or less.

(5) As power poles.

(6) In Class I, Division 2 hazardous (classified) locations as permitted in 501.4(B)(3).

(7) As extensions of unbroken lengths through walls, partitions, and floors where closure strips are removable from either side and the portion within the wall, partition, or floor remains covered.

(8) Ferrous channel raceways and fittings protected from corrosion solely by enamel shall be permitted only indoors.

Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?

CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-144 Log #1997 NEC-P08 **Final Action: Reject**
(384.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.

Comment on Proposal No: 8-234

Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-234.

Substantiation: This Task Group was assembled per the request of the TCC.

Panel Meeting Action: Reject

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-145 Log #2357 NEC-P08 **Final Action: Accept in Principle**
(384.10)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-234

Recommendation: Revise text to read as follows:

384.10 Uses Permitted. The use of strut-type channel raceways shall be permitted in the following:

(1) Where exposed.

(2) In dry locations.

(3) In locations subject to corrosive vapors where protected by finishes judged suitable for the condition.

(4) Where the voltage is 600 volts or less.

(5) As power poles.

(6) In Class I, Division 2 hazardous (classified) locations as permitted in 501.4(B)(3).

(7) As extensions of unbroken lengths through walls, partitions, and floors where closure strips are removable from either side and the portion within the wall, partition, or floor remains covered.

(8) Ferrous channel raceways and fittings protected from corrosion solely by enamel shall be permitted only indoors.

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

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

8-146 Log #3527 NEC-P08 **Final Action: Reject**
(384.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-234
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-234.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-147 Log #597 NEC-P08 **Final Action: Accept**
(384.12)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-235
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-148 Log #1918 NEC-P08 **Final Action: Accept in Principle**
(384.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-235
Recommendation: Revise text to read as follows:
384.12 Uses Not Permitted. Strut type channel raceways shall not be used as followes:
(1) Where concealed.
(2) Ferrous channel raceways and fittings protected from corrosion solely by enamel shall not be permitted where subject to severe corrosive influences.
Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the dame reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!
I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolving that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?
CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Groups' substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-149 Log #1999 NEC-P08 **Final Action: Reject**
(384.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-235
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-235.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-150 Log #2356 NEC-P08 **Final Action: Accept in Principle**
(384.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-235
Recommendation: Revise text to read as follows:
384.12 Uses Not Permitted. Strut type channel raceways shall not be used as follows:
(1) Where concealed.
(2) Ferrous channel raceways and fittings protected from corrosion solely by enamel shall not be permitted where subject to severe corrosive influences.
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns

of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-151 Log #3528 NEC-P08 **Final Action: Reject**
(384.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-235
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-235.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-152 Log #3539 NEC-P08 **Final Action: Accept**
(384.12)

Submitter: Elaine Thompson, Allied Tube & Conduit
Comment on Proposal No: 8-235
Recommendation: This proposal should continue to be rejected but if the panel accepts the TCC comment, make the following changes:

Delete (3) and change (2) as follows:

"Ferrous channel raceways and fittings protected from corrosion solely by enamel shall not be permitted <u>outdoors nor</u> where subject to severe corrosive influences."

Change (8) as follows:

"(8) In <u>damp or</u> wet locations"

Substantiation: I agree with the panel's rejection of deleting Uses Permitted since this change does not add to the "user-friendliness" of the code as intended and since it is not being applied uniformly to all applicable articles. However, if the panel accepts the TCC public comment, these changes should be made.

Combining (2) and (3) is more concise and conveys the appropriate intent. Since Strut Type Channel Raceways are only permitted in dry locations, "damp" needs to be added to (8).

Panel Meeting Action: Accept
Panel Statement: The panel agrees with the submitter's recommendation to continue to reject. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 386 — SURFACE METAL RACEWAYS

8-153 Log #598 NEC-P08 **Final Action: Accept**
(386.10)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-237
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-154 Log #1920 NEC-P08 **Final Action: Accept in Principle**
(386.10)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-237
Recommendation: Revise text to read as follows:

386.10 Uses Permitted. The use of surface metal raceways shall be permitted in the following:

(1) In dry locations

(2) In Class I, Division 2 hazardous (classified) locations as permitted in 501.4(B)(3).

(3) Under raised floor, as permitted in 645.5(D)(2).

(4) Extension through walls and floors. Surface metal raceway shall be permitted to pass transversely through dry walls, dry partitions, and dry floors if the length passing through is unbroken. Access to the conductors shall be maintained on both sides of the wall, partition, or floor.

Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provi-

sion for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?

CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-155 Log #2000 NEC-P08 **Final Action: Reject**
(386.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.

Comment on Proposal No: 8-237

Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-237.

Substantiation: This Task Group was assembled per the request of the TCC.

Panel Meeting Action: Reject

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-156 Log #2355 NEC-P08 **Final Action: Accept in Principle**
(386.10)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-237

Recommendation: Revise text to read as follows:

386.10 Uses Permitted. The use of surface metal raceways shall be permitted in the following:

(1) In dry locations.

(2) In Class I, Division 2 hazardous (classified) locations as permitted in 501.4(B)(3).

(3) Under raised floors, as permitted in 645.5(D)(2).

(4) Extension through walls and floors. Surface metal raceway shall be permitted to pass transversely through dry walls, dry partitions, and dry floors if the length passing through is unbroken. Access to the conductors shall be maintained on both sides of the wall, partition, or floor.

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-157 Log #3529 NEC-P08 **Final Action: Reject**
(386.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.

Comment on Proposal No: 8-237

Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-237.

Substantiation: This task group was assembled per the request of the TCC

Panel Meeting Action: Reject

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-158 Log #599 NEC-P08 **Final Action: Accept**
(386.12)

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 8-238

Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-159 Log #1923 NEC-P08 **Final Action: Accept in Principle**
(386.12)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-238

Recommendation: Revise text to read as follows:

(1) Where subject to severe physical damage, unless otherwise approved

(2) Where the voltage is 300 volts or more between conductors, unless the metal has thickness of not less than 1.02 mm (0.040 in.) nominal

(3) Where subject to corrosive vapors
(4) In hoistways
(5) Where concealed, except as permitted in 386.10

Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?

CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-160 Log #2001 NEC-P08 **Final Action: Reject**
(386.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-238
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-238.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-161 Log #2354 NEC-P08 **Final Action: Accept in Principle**
(386.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-238
Recommendation: Revise text to read as follows:

386.12 Uses Not Permitted. Surface metal raceways shall not be used in the following:
(1) Where subject to severe physical damage, unless otherwise approved
(2) Where the voltage is 300 volts or more between conductors, unless the metal has thickness of not less than 1.02 mm (0.040 in.) nominal
(3) Where subject to corrosive vapors
(4) In hoistways
(5) Where concealed, except as permitted in 386.10

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-162 Log #3530 NEC-P08 **Final Action: Reject**
(386.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-238
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-238.
Substantiation: This task group was assembled per the request of the TCC
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-163 Log #3538 NEC-P08 **Final Action: Accept**
(386.12)

Submitter: Elaine Thompson, Allied Tube & Conduit
Comment on Proposal No: 8-238
Recommendation: This proposal should continue to be rejected but if the panel accepts the TCC comment, make the following changes:
Delete (5).
Rewrite (6) as follows: Where concealed, except as an extension to pass transversely through dry walls, dry partitions, and dry floors if the length passing through is unbroken and access to the conductors is maintained on both sides of the wall, partition, or floor.
Substantiation: I agree with the Panel's rejection of deleting Uses Permitted since this change does not add to the "user-friendliness" of the code as needed and since it is not being applied uniformly to all applicable articles. However, if the panel accepts the TCC public comment, these changes should be made.
The material in (5) is adequately covered by the new (6) and is consistent with the rewrite of 376.12.
Panel Meeting Action: Accept
Panel Statement: The panel agrees with the submitter's recommendation to continue to reject. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-164 Log #130 NEC-P08 **Final Action: Reject**
(386.12(1))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-239
Recommendation: Accept as proposed, with the deletion of the additional word "physical."
Substantiation: Whether as inspector or contractor, I wouldn't want to be in the position of assessing, or arguing, the severity of potential damage. Would you? There is no reason to treat this differently than Proposal 15-86. As for the word "physical," it adds no information, and we want to eliminate gratuitous wording.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-109.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-165 Log #1394 NEC-P08 **Final Action: Accept in Principle**
(386.30)

Submitter: Sam A. Malone Saginaw, MI
Comment on Proposal No: 8-242
Recommendation: 386.30 Securing and Supporting. Surface metal raceways shall be supported at intervals in accordance with the manufacturer's installation instructions.
Substantiation: As an electrician, I get surface metal raceway from a distributor and I cannot remember the last time I saw instructions included with the product. If it comes from the factory in a box, installation instructions are probably in the box. Most of the product I install comes by the piece and there are no instructions included. Mr. Lloyd and the proposer of this section are correct in their recommendation for a new section stating installation instructions. I agree with the original proposal that gives actual support spacing requirements. Those proposed by Mr. Eickholt seem reasonable to me, but I agree he did not provide adequate substantiation for the support spacings recommended. I will say from my experience that his minimum support spacings are practical. As a compromise to make it clear that a minimum support spacing is a requirement, I am recommending you accept the original proposal in principle and use the language recommended by Mr. Lloyd in his comment.
Panel Meeting Action: Accept in Principle
Revise recommendation as submitted to read: 386.30 Securing and Supporting. Surface metal raceways shall be secured and supported at intervals in accordance with the manufacturer's installation instructions.
Panel Statement: Adding the words "secured and" to the recommendation adds clarity.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-166 Log #600 NEC-P08 **Final Action: Accept**
(388.10)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-246
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 388 SURFACE NONMETALLIC RACEWAYS

8-167 Log #1924 NEC-P08 **Final Action: Accept in Principle**
(388.10)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-246
Recommendation: Revise text to read as follows:
388.10 Uses Permitted. Surface nonmetallic raceway shall be permitted as follows:
(1) The use of surface nonmetallic raceways shall be permitted in dry locations.
(2) Extension through walls and floors shall be permitted. Surface nonmetallic raceway shall be permitted to pass transversely through dry walls, dry partitions, and dry floors if the length passing through is unbroken. Access to the conductors shall be maintained on both sides of the wall, partition, or floor.
Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!
I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve

that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?

CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-168 Log #2002 NEC-P08 **Final Action: Reject**
(388.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.

Comment on Proposal No: 8-246

Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-246.

Substantiation: This Task Group was assembled per the request of the TCC.

Panel Meeting Action: Reject

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-169 Log #2126 NEC-P08 **Final Action: Accept**
(388.10)

Submitter: William A. Wolfe, Steel Tube Institute of North America

Comment on Proposal No: 8-246

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

Panel Statement: See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-170 Log #2353 NEC-P08 **Final Action: Accept in Principle**
(388.10)

Submitter: James M. Imlah, City of Hillsboro

Comment on Proposal No: 8-246

Recommendation: Revise text to read as follows:

388.10 Uses Permitted. Surface nonmetallic raceway shall be permitted as follows:

(1) The use of surface nonmetallic raceways shall be permitted in dry locations.

(2) Extension through walls and floors shall be permitted. Surface nonmetallic raceway shall be permitted to pass transversely through dry walls, dry partitions, and dry floors if the length passing through is unbroken. Access to the conductors shall be maintained on both sides of the wall, partition, or floor.

Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.

CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.

Panel Meeting Action: Accept in Principle

Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

8-171 Log #3531 NEC-P08 **Final Action: Reject**
(388.10)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-246
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-246.
Substantiation: This task group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-172 Log #601 NEC-P08 **Final Action: Accept**
(388.12)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-247
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstanding in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-173 Log #1925 NEC-P08 **Final Action: Accept in Principle**
(388.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-247
Recommendation: Revise text to read as follows:
388.12 Uses Not Permitted. Surface nonmetallic raceways shall not be used in the following:
(1) Where concealed, except as permitted in 388.2
(2) Where subject to severe physical damage
(3) Where the voltage is 300 volts or more between conductors, unless listed for higher voltage
(4) In hoistways
(5) In any hazardous (classified) location except Class I, Division 2 locations as permitted in 501.4(B)(3)
(6) Where subject to ambient temperatures exceeding those for which the nonmetallic raceway is listed
(7) For conductors whose insulation temperature limitations would exceed those for which the nonmetallic raceway is listed
Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!
I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?
CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-174 Log #2003 NEC-P08 **Final Action: Reject**
(388.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-247
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-247.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-175 Log #2127 NEC-P08 **Final Action: Accept**
(388.12)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-247
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
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-176 Log #2352 NEC-P08 **Final Action: Accept in Principle**
(388.12)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-247
Recommendation: Revise text to read as follows:
388.12 Uses Not Permitted. Surface nonmetallic raceways shall not be used in the following:
(1) Where concealed, except as permitted in 388.2
(2) Where subject to severe physical damage
(3) Where the voltage is 300 volts or more between conductors, unless listed for higher voltage
(4) In hoistways
(5) In any hazardous (classified) location except Class I, Division 2 locations as permitted in 501.4(B)(3)
(6) Where subject to ambient temperatures exceeding those for which the nonmetallic raceway is listed
(7) For conductors whose insulation temperature limitations would exceed those for which the nonmetallic raceway is listed
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most codebooks because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion of installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!
I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is only a language and wording style issue to be resolved, because it looks and sounds better.
CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-177 Log #3532 NEC-P08 **Final Action: Reject**
(388.12)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-247
Recommendation: CMP 8 should have accepted or accepted in principle Proposal 8-247.
Substantiation: This task group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-178 Log #3540 NEC-P08 **Final Action: Accept**
(388.12)

Submitter: Elaine Thompson, Allied Tube & Conduit
Comment on Proposal No: 8-247
Recommendation: This proposal should continue to be rejected but if the panel accepts the TCC comment, make the following changes:
Delete (1)
Revise (8) to read: "In damp or wet locations."
Combine (9) and (10) as follows:
"In concealed spaces, except as an extension to pass transversely through dry walls, dry partitions, and dry floors if the length passing through is unbroken and access to the conductors is maintained on both sides of the wall, partition, or floor."
Substantiation: I agree with the panel's rejection of deleting Uses Permitted since this change does not add to the "user-friendliness" of the code as intended and since it is not being applied uniformly to all applicable articles. However, if the panel accepts the TCC public comment, these changes should be made.
(1) is covered by (9) and (10).
In Uses permitted, surface nonmetallic raceways are only permitted in dry locations. "Damp" was inadvertently omitted from Uses Not Permitted.
Combining (9) and (10) retains the intent of the 2 requirements, makes the section easier to read, and is consistent with the rewrite of 376.12 in Proposal 8-210.
Panel Meeting Action: Accept
Panel Statement: The panel agrees with the submitter's recommendation to continue to reject. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-179 Log #129 NEC-P08 **Final Action: Reject**
(388.12(2))

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 8-248
Recommendation: Accept as proposed, with the deletion of the additional word "physical."
Substantiation: Whether as inspector or contractor, I wouldn't want to be in the position of assessing, or arguing, the severity of potential damage. Would you? There is no reason to treat this differently than Proposal 15-86. As for the word "physical," it adds no information, and we want to eliminate gratuitous wording.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-109.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 390 — UNDERFLOOR RACEWAYS

8-180 Log #602 NEC-P08 **Final Action: Accept**
(390.2)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 8-257
Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal to correlate with the actions Code-Making Panel 7 took on similar proposals. The present text creates inherent misunderstand-

ing in the uses permitted versus not permitted and the panel has not addressed that particular issue. The panel should consider modifications to the language to place any necessary restrictions in the uses not permitted section. The Technical Correlating Committee is directing the chair of Code-Making Panel 8 to appoint members to work with members of the Usability Task Group to develop comments that would make the approach acceptable to the panel. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: See panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-181 Log #2004 NEC-P08 **Final Action: Reject**
(390.2)

Submitter: Julian R. Burns, Burns Electrical/Quality Power Solutions, Inc.
Comment on Proposal No: 8-257
Recommendation: CMP-8 should have Accepted or Accepted In Principle Proposal 8-257.
Substantiation: This Task Group was assembled per the request of the TCC.
Panel Meeting Action: Reject
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-182 Log #2128 NEC-P08 **Final Action: Accept**
(390.2)

Submitter: William A. Wolfe, Steel Tube Institute of North America
Comment on Proposal No: 8-257
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
Panel Statement: See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-183 Log #1927 NEC-P08 **Final Action: Accept in Principle**
(390.2(A) and 390-2(B))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-257
Recommendation: Revise text to read as follows:

392.3 Uses Permitted. Cable tray shall be permitted to be used as a support system for services, feeders, branch circuits, communications circuits, control circuits, and signaling circuits. Cable tray installations shall not be limited to industrial establishments. Where exposed to direct rays of the sun, insulated conductors and jacketed cables shall be identified as being sunlight resistant. Cable trays and their associated fittings shall be identified for the intended use.

(A) Wiring Methods. The wiring methods in Table 392.3(A) shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.

(B) In Industrial Establishments. The wiring methods in Table 392.3(A) shall be permitted to be used in any industrial establishment under the conditions described in their respective articles. In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installed cable tray system, any of the cables in 392.3(B)(1) and (2) shall be permitted to be installed in ladder, ventilated trough, solid bottom, or ventilated channel cable trays.

(1) Single Conductors. Single-conductor cables shall be permitted to be installed in accordance with the following:

(a) Single-conductor cable shall be 1/0 AWG or larger and shall be of a type listed and marked on the surface for use in cable trays. Where 1/0 AWG through 4/0 AWG single-conductor cables are installed in ladder cable tray, the maximum allowable rung spacing for the ladder cable tray shall be 230 mm (9 in.).

(b) Welding cables shall comply with the provisions of Article 630, Part IV.

(c) Single conductors used as equipment grounding conductors shall be insulated, covered, or bare, and they shall be 4 AWG or larger.

(2) Medium Voltage. Single- and multiconductor medium voltage cables shall be Type MV cable (Article 328). Single conductors shall be installed in accordance with 392.3(B)(1).

(C) Equipment Grounding Conductors. Metallic cable trays shall be permitted to be used as equipment grounding conductors where continuous maintenance and supervision ensure that qualified persons service the installed cable tray system and the cable tray complies with provisions of 392.7.

(D) Hazardous (Classified) Locations. Cable trays in hazardous (classified) locations shall contain only the cable types permitted in 501.4, 502.4, 503.3, 504.20, and 505.15.

(E) Nonmetallic Cable Tray. In addition to the uses permitted elsewhere in Article 392, nonmetallic cable tray shall be permitted in corrosive areas and in areas requiring voltage isolation.

392.4 Uses Not Permitted.

Cable tray systems shall not be used in hoistways or where subject to severe physical damage. Cable tray systems shall not be used in environmental airspaces, except as permitted in 300.22, to support wiring methods recognized for use in such spaces.
Substantiation: At the request of the Technical Correlating Committee, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the codebook is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his discretion after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!

I still have a lack of understanding of why a "use not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolve that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?

CMP-8 and even some of the members of CMP-7 disagree with the Technical Correlating Committee and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunder-

standing. There have been no panel proposals this cycle to delete uses permitted except by the Technical Correlating Committee and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organizations CMP representatives have voted to reject the proposal. We all know, the CMP members, the Technical Correlating Committee, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted?" Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-184 Log #2350 NEC-P08 **Final Action: Accept in Principle**
(390.2(A), and 390.2(B))

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 8-257
Recommendation: Revise text to read as follows:
392.3 Uses Permitted. Cable tray shall be permitted to be used as a support system for services, feeders, branch circuits, communications circuits, control circuits, and signaling circuits. Cable tray installations shall not be limited to industrial establishments. Where exposed to direct rays of the sun, insulated conductors and jacketed cables shall be identified as being sunlight resistant. Cable trays and their associated fittings shall be identified for the intended use.
(A) Wiring Methods. The wiring methods in Table 392.3(A) shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections.
(B) In Industrial Establishments. The wiring methods in Table 392.3(A) shall be permitted to be used in any industrial establishment under the conditions described in their respective articles. In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons service the installed cable tray system, any of the cables in 392.3(B)(1) and (2) shall be permitted to be installed in ladder, ventilated trough, solid bottom, or ventilated channel cable trays.
(1) Single Conductors. Single-conductor cables shall be permitted to be installed in accordance with the following:
(a) Single-conductor cable shall be 1/0 AWG or larger and shall be of a type listed and marked on the surface for use in cable trays. Where 1/0 AWG through 4/0 AWG single-conductor cables are installed in ladder cable tray, the maximum allowable rung spacing for the ladder cable tray shall be 230 mm (9 in.).
(b) Welding cables shall comply with the provisions of Article 630, Part IV.
(c) Single conductors used as equipment grounding conductors shall be insulated, covered, or bare, and they shall be 4 AWG or larger.
(2) Medium Voltage. Single- and multiconductor medium voltage cables shall be Type MV cable (Article 328). Single conductors shall be installed in accordance with 392.3(B)(1).
(C) Equipment Grounding Conductors. Metallic cable trays shall be permitted to be used as equipment grounding conductors where continuous maintenance and supervision ensure that qualified persons service the installed cable tray system and the cable tray complies with provisions of 392.7.
(D) Hazardous (Classified) Locations. Cable trays in hazardous (classified) locations shall contain only the cable types permitted in 501.4, 502.4, 503.3, 504.20, and 505.15.
(E) Nonmetallic Cable Tray. In addition to the uses permitted elsewhere in Article 392, nonmetallic cable tray shall be permitted in corrosive areas and in areas requiring voltage isolation.
392.4 Uses Not Permitted. Cable tray systems shall not be used in hoistways or where subject to severe physical damage. Cable tray systems shall not be used in environmental airspaces, except as permitted in 300.22, to support wiring methods recognized for use in such spaces.
Substantiation: At the request of the TCC, the uses permitted and uses not permitted are requested to be altered to identify and list the uses not permitted and that only those items would be considered enforceable. This really creates a big handicap and becomes very restrictive to the inspectors and installers. Please understand that the purpose of the code book is to provide information mainly for installers. Installers buy the most code books because they want to make safe installations and this is being accomplished by knowing what the permitted uses are. This positive language to the installer provides a clear understanding for the requirements for code compliant installations, but he also looks at the uses not permitted for the same reasons. I thought the purpose for code change was because there have been deaths or hazard to persons or property, where are the safety issues, where is the documentation of fires, what deaths have occurred? We must remember that the installer and inspectors are working with code minimums, keep uses permitted for understanding the minimum installation desired. The options that will be left to the inspector is enforce the "not permitted uses", but with innovations and alternate installation methods being installed every day there may be no option for the inspector to determine if the installation is safe. When installations are not part of the list of "uses permitted," there is confusion for installers, suppliers, electrical contractors and inspectors of a new methodology. I hope you understand that inspectors, jurisdictions, contractors, manufacturers and installers will be responsible for increased liability. Where a new method or process it is not restricted, (at least until a new code is adopted, three years or in some jurisdictions longer yet) it is assumed to be acceptable. I have brought up the concerns of uses permitted and not permitted to other inspectors and discussed the issues at our inspector meeting and the most standard question is "why does it have to change, there does not appear to be a problem." For my jurisdiction, the use of 90.4 is allowed by permission of the building official only, for special issues at his desecration after presentation of code issues. A majority of the time new processes will not be accepted or approved by the building official, except when reviewed by an independent third party evaluation!
I still have a lack of understanding of why a "uses not permitted" is the only option to resolve possible code language conflicts. It is my understanding that the initial issue arose in a single code panel of a conflict in a specific article, does that mean the whole book has to be changed because of the "uses not permitted" is the ONLY solution? If there are code conflicts in some articles, then work on the specific problem section case by case and find a way to resolving that issue. In referencing 90.1 as to the code purpose and 110.3 for requirement for electrical installations, this proposal does not promote suitability of the installation within the provisions of this code. Additionally, there is no provision for providing the practical safeguarding of persons and property from hazards from the use of electricity because of the legal liabilities that will be challenged to all involved with an electrical installation. I need to ask a question, is it the CMP's responsibility to work towards safe installations being made by the installers or is it only a language and wording style issue to be resolved, because it looks and sounds better?
CMP-8 and even some of the members of CMP-7 disagree with the TCC and the Usability Task Group's substantiation that the current "uses permitted" and "uses not permitted" does not create misunderstanding. There have been no panel proposals this cycle to delete uses permitted except by the TCC and the task groups. The rewritten article for flat conductor cable, found in the ROP has been approved with sections listing "uses permitted" and "uses not permitted" within the article. Contractors, installers, manufacturers, engineers, testing laboratories, inspectors and labor organization CMP representatives have voted to reject the proposal. We all know, the CMP members, the TCC, the Usability Task Group and even the everyday installer, not everything covered on lists of these types will be included, so why do we need to be limited to "uses not permitted"? Please continue to reject this proposal.
Panel Meeting Action: Accept in Principle
Panel Statement: The panel accepts the commenter's recommendation that the text in the 2002 NEC remain unchanged. See the panel statement and action on Comment 8-54.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-185 Log #2080 NEC-P08 **Final Action: Reject**
(390-17)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-258
Recommendation: Reject the proposal.
Substantiation: For good reason, the underfloor raceway articles forbid the reinsulation of conductors at abandoned outlets. However, the present Code builds in a powerful economic incentive to violate these rules. This is because 310.15(B)(2)(a) complicates the simple solution to the problem. Although the mutual conductor derating rules actually apply regardless of whether this proposal is accepted, the panel action sends the wrong message to CMP 6.
The best solution to the built-in incentive for re-insulating wires is to use one pair of conductors for each outlet, spliced in a header duct of some kind. Then if an outlet is to be abandoned, the pair of wires can be simply withdrawn with a pull wire left in place for the future. Although this can be done now, the literal effect of 310.15(B)(2)(a) is to require oversized conductors on many runs, which needlessly discourages the practice. In fact, with generally small loads split up over many pairs of wires, or even a large load using only one pair of wires in a group, there is no problem. These raceways are large in area and well embedded in an excellent "heat sink" medium. Massachusetts has made this exception for the last seven editions of the Code without incident, albeit with a wireway-style fill limitation (not over 30 current-carrying conductors at any cross-section).
The proposal should be rejected for now and CMP 8 should consider modifying the application of 310.15(B)(2)(a) along these lines in the 2008 cycle. After all, if these installations overheat, then the wireways would also. One of these metal raceways embedded in a concrete floor would be very unlikely to cause a problem for the enclosed conductors based on standard usage patterns and similarities with other raceways of comparable cross section. No harm will be done because the derating penalties apply anyway until and unless the code is changed.
Panel Meeting Action: Reject
Panel Statement: The submitter's substantiation accurately points out that 310.15(B)(2) applies to this section regardless of acceptance in this article.

However, the panel reaffirms the necessity to include the proposed reference to ensure the appropriate application of under-floor raceway as outlined by the original proposal.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 392 — CABLE TRAYS

8-186 Log #2391 NEC-P08 **Final Action: Reject**
(392.3(A))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 8-263
Recommendation: The Proposal should have been accepted in principle in part.
The new paragraph to be added after 392.3(A) should read:
~~Single conductors or~~ multiconductor cables that are listed and marked ~~as~~ with either the legend MV-90 OR MC or the legend MV-105 OR MC shall be permitted to be installed in cable tray.
Substantiation: The Panel Statement on Proposal 8-263 conflicts with 330.12(5) which permits Type MC cable without "an outer (nonmetallic) jacket" to be installed in cable tray. Type MC cable with "an outer (nonmetallic) jacket" must pass the vertical tray flame test and be identified for use in cable tray before it can be installed in cable tray in any occupancy. There is no restriction in 330.12 on the type of occupancy.
The current text is not explicit regarding the installation of medium voltage Type MC cables in cable tray in other than industrial establishments.
In accordance with the NEC, UL 1072 permits single and multiconductor medium voltage cables that comply with the requirements of both UL 1072, Medium-Voltage Power Cables, and UL 1569, Metal-Clad Cables, to be listed and labeled with the dual designation of either "MV-90 or MC" or "MV-105 or MC". These designations permit the cable to be installed as either Type MV or MC cable as authorized by the respective Code Articles.
In Article 330, the following sections address medium voltage Type MC cable:
330.112(B) defines the insulated conductors over 600 V that are permitted to be installed in MC cable.
330.24(C) defines the minimum bending radius for shielded conductors that would only apply to cables rated over 2 kV, thus medium voltage, as defined in 328.2.
392.3 stipulates that "Cable tray shall be permitted to be used as a support system…" and that "Cable tray installations shall not be limited to industrial establishments."
392.3(A) states that "The wiring methods in Table 392.3(A) shall be permitted to be installed in cable tray systems under the conditions described in their respective articles and sections." Table 392.3(A) lists "Metal-clad cable" as an acceptable wiring method for installation in cable tray without any restriction on the type of occupancy.
392.3(B)(2) addresses single and multiconductor Type MV cable with an outer nonmetallic covering, not medium voltage cable that is also listed as Type MC. Single and multiconductor Type MV cable has an outer nonmetallic covering; it does not have the metallic sheath or armor required on Type MC cable.
Type MC cable containing medium voltage insulated conductors is currently authorized to be installed as exposed wiring in any occupancy; no restrictions. The exposed wiring installation is not limited to industrial establishments. Does it make any sense to authorize an exposed wiring installation of a medium voltage Type MC cable (Type MV-90 OR MC) next to a cable tray in a non-industrial occupancy and not allow the same identical cable to be installed in the adjacent cable tray, which would provide support and additional physical protection for the cable?
I agree with the restriction in 392.3(B)(1) and (2) that single conductors of any voltage should be limited to industrial establishments.
Now, if the CMP believes that Table 392.3(A) already authorizes the installation of medium-voltage Type MC cable in cable tray in any occupancy and no change in the Code is required, the CMP can reject this Comment and include such a statement in the substantiation. This will correct the Panel Statement made on Proposal 8-17 in the 2001 ROP and on Proposal 8-263 in the ROP for the 2005 Code.
Panel Meeting Action: Reject
Panel Statement: The present requirements in the Code cover the submitter's concern. Table 392.3(A) permits MC Cable in accordance with Article 330 in all occupancies.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-187 Log #1246 NEC-P08 **Final Action: Reject**
(392.3(B))

Submitter: Charles M. Trout, Maron Electric Co. Inc.
Comment on Proposal No: 8-264
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 to use. The only way to appropriately apply (B) is to provide prescriptive requirements that the Authority Having Jurisdiction can use to enforce the intent.
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 statement and action on Comment 8-107.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-188 Log #3447 NEC-P08 **Final Action: Reject**
(392-3(B)(1)(a))

Submitter: Richard J. Buschart, Cable Tray Institute
Comment on Proposal No: 8-266
Recommendation: The proposal should be accepted. There is no safety issue with installing single conductor cables in a ladder cable tray with rung spacings larger than 230 mm (9 in.)
Substantiation: 1/0 AWG through 4/0 AWG single conductor cables are large cables that could span spacings greater than 230 mm (9 in.) without any safety issue.
Panel Meeting Action: Reject
Panel Statement: No new supporting technical data were submitted.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-189 Log #3449 NEC-P08 **Final Action: Accept**
(392.7(A))

Submitter: Richard J. Buschart, Cable Tray Institute
Comment on Proposal No: 8-274
Recommendation: The original proposal should be accepted as is "250.96" should replace "in Article 250".
Substantiation: 250.96 indicates the grounding requirements for cable tray. Section 250 Part IV only indicates that metal enclosures are to be grounded and is incomplete. Sections 250.96 and 250.102 referenced in 392.7(B)(4) are not included in 250 Part IV.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-190 Log #85 NEC-P08 **Final Action: Accept in Principle**
(392.7(B)(4))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 8-276
Recommendation: Accept revised as follows:
Where single conductor cables comprising each phase, or neutral, or grounded conductor are connected in parallel as permitted in 310.4, the conductors of alternating-current circuits shall be installed in groups consisting of not more than one conductor per phase, neutral, or grounded conductor, to prevent current imbalance in the paralled conductors due to inductive reactance.
Substantiation: The proposal is intended to specifically include grounded conductors which are not neutrals 2-wire and center tapped 4-wire delta. Inclusion of grounded conductors would be consistent with 310.4 and remove a possible perceived difference in requirements pertaining to the same thing.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-193. The panel recognizes that the comment reference should have been to Proposal 8-277 and that the section referenced should have been 392.8(D).
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-191 Log #76 NEC-P08 **Final Action: Accept in Principle**
(392.8(D))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 8-277
Recommendation: Accept proposal revised as follows:
Where single conductor cables comprising each phase, neutral, or grounded conductor of an alternating-current are connected in parallel as permitted in 310.4, the conductors shall be installed in groups consisting of not more than one conductor per phase neutral, or grounded conductor to prevent current unbalance due to inductive reactance.
Substantiation: Alternating-current circuits are specified as 310.4 does not exclude dc circuits and the proposal would clarify that "phase" pertains to ac circuits. Grounded conductors which are not neutrals would be included.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-193.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-192 Log #379 NEC-P08 **Final Action: Accept in Principle**
(392.8(D))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 8-277
Recommendation: Accept proposal revised:
Where single conductor cables comprising each phase, neutral, or grounded conductor are connected in parallel as permitted in 310.4, the conductors shall be installed in groups consisting of not more than one conductor per phase, neutral, or grounded conductor. (remainder unchanged)
Substantiation: Some circuits may not have a "neutral". A conductor connected to the midphase of a 4-wire delta system may not be deemed a neutral and a corner grounded delta system conductor may be deemed to be a grounded conductor rather than a phase conductor.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 8-193.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-193 Log #699 NEC-P08 **Final Action: Accept**
(392.8(D))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 8-277
Recommendation: Accept proposal as revised:
Where single conductor cables comprising each phase, ~~or~~ neutral; or grounded conductor of an alternating-current circuit are connected in parallel as permitted in 310.4 the conductors shall be installed in groups consisting of not more than one conductor per phase, ~~or~~ neutral, or grounded conductor to prevent current imbalance in the paralleled conductors due to inductive reactance.
Substantiation: Specifying alternating current will indicate that paralleled dc circuit conductors are not included, since "polarity" was accepted in Proposal 6-7 for 310.4 to include dc circuit conductors. Grounded conductors that are not "neutrals" should be included.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-194 Log #10 NEC-P08
(Table 392.9)

Note: The Technical Correlating Committee directs the following change: Change "Sd" for all the SI units in Column 4 of Table 392.9 to "25 Sd" to be consistent with Section 4-4.7.1 of the NFPA Regulations Governing Committee Projects and 3.2.7 and Annex C of the NEC Style Manual.
Submitter: John Paschal, Bechtel
Comment on Proposal No: 8-280
Recommendation: I concur with the "accepted" proposal 8-280 of Brett Becker for Overall Column 2 of Table 392.9. However, even after making the corrections identified in proposal 8-280, an almost identical error will still exist in sub-column 4 of this same table.
Substantiation: Specifically, the problem exists in Table 392.6, Overall Column 4, the sub-column for mm^2 use. Here the term S_d under the sq in. column is supposed to mean (1 in. x S_d) in., but the (1-in.) is not stated, and thus the typist did not know to multiply the 1 in. by the conversion of 25.4 mm per in. To eliminate the problem, the S_d under the sq mm column of overall column 4 should be converted to 25.4 mm x S_d mm instead of S_d.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its action on Proposal 8-280. This comment is being rejected because the submitter did not supply any recommended text as required in 4.4.5 of the Regulations Governing Committee Projects.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 12 Negative: 1
Explanation of Negative:
GRIFFITH: Although I agree the submitter did not properly present his argument, the panel action for this comment should have been to accept in principle.
The metric side of both column 2 and column 4 of Table 392.9 has, in effect, a typographical error as presently written. During the proposal phase, the panel accepted a proposal to revise the metric side of column 2 when it was agreed the value of "30" should be substituted for "1.2" in each of the expressions for calculating tray fill area under the mm2 heading of column 2. For example, the first entry in column 2 will now (correctly) read "4500 —(30 Sd)" instead of "4500 — (1.2 Sd)" as in the current code. The (approximate) difference between 30 and 1.2 is simply the multiplying factor of 25.4 required to convert inches into mm.
The same error exists under the mm2 heading of column 4 where "25 Sd" should be substituted for "Sd". With this correction, the first entry in column 4 under the mm2 heading would (correctly) read "3500 — 25 Sd" while the last entry would read "21,300 — 25 Sd". The same correction would be made to all intervening lines of column 4.
The need for the correction can be seen by inspection. It is obvious from column 4 that 3500 mm2 is (approximately) determined by 5.5 x 25.4 x 25.4, the expected conversion of inches2 to mm2. One would then conclude that the Sd term under the metric heading would also require 25.4 x 25.4 times Sd, when Sd was expressed in inches. If Sd was expressed in mm. in that column, then a 25.4 coefficient would still be required. If we round-off for simplicity, the last term would be "25 SD", not "Sd" as presently shown in the table.
However, a more complete mathematical calculation also proves this point. For example, if Sd was 1.5 inches for the first line in column 4, we would calculate a usable area of 5.5 — 1.5, or 4 square inches of usable area remaining. We can convert 4 square inches to metric area as follows:
4 x 25.4 x 25.4 = 2580 mm2
If we calculate the usable area from the expression presently given under the mm2 heading of column 4, we get:
3500 — (1.5 x 25.40) = 3462 mm2,
which does not agree with the value calculated above. On the other hand, if we include the proposed correction factor we would calculate the usable area as;
3500 — 25 (1.5 x 25.4) = 2547 mm2,
which is within the round-off accuracy of these formulae as they are used throughout the table. Similar calculations could be made for each line of column 4.
Officially, the NEC is not a design manual. As a practical matter, however, it is used in industry by prudent designers who intend their design to be code compliant. For that and other reasons, it does not seem appropriate for the panel to allow a known error in this table to remain uncorrected.

8-195 Log #3450 NEC-P08 **Final Action: Reject**
(392.9)

Submitter: Richard J. Buschart, Cable Tray Institute
Comment on Proposal No: 8-279
Recommendation: This proposal should be accepted.
Substantiation: Cable tray systems that contain only control and signal should be allowed to use the full depth of the cable tray. The current in these conductors is typically milliamples and, therefore, heating of conductors is not an issue.
Panel Meeting Action: Reject
Panel Statement: No new supporting technical data were submitted.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-196 Log #2082 NEC-P08 **Final Action: Accept**
(392.9(A)(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-281
Recommendation: Reject the proposal.
Substantiation: The proposal is incomplete and cannot be made whole because to do so would require wholesale introduction of extensive material that has not had public review. To wit:

1. 392.9(A)(2) would need a comparable allowance, and this would need to be based on a completely new consideration of the numbers and/or calculation procedure in Table 392.9.
2. 392.9(A)(3) would require similar attention, including some provision about whether the size of the multiconductor cables is to be based on conductor size or overall cable diameter.
3. 392.9(C) would require redrafting, since it only apples to multconductor cables. As can be seen in the panel reaction to Proposals 8-283 and 8-284, this involves intricate technical considerations that are much more than editorial problems.
4. 392.9(E) would require redrafting for the same reason.
5. 392.10 would require correlation throughout its provisions.
6. 392.11 would require investigation, since if the multiconductor cables intruded on the assumed spacing that underlies the ampacity assumptions in this section, the resulting ampacities would change.

The submitter, mindful of the comment in the voting that this practice is used in industry, spent considerable time attempting to frame an editorial response to this proposal and the concerns expressed in the voting, and finally concluded that a task group would be required to comprehensively address the problem. The concept exactly bridges 392.9 and 392.10, and a new section should probably be drafted, entitled "Allowable Fill in Cable Trays with both Single and Multiconductor Cables." Then 392.11 could get a new lettered subsection covering any ampacity adjustments required.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-197 Log #3451 NEC-P08 **Final Action: Reject**
(Table 392.10(A))

Submitter: Richard J. Buschart, Cable Tray Institute
Comment on Proposal No: 8-283
Recommendation: This proposal should be accepted.
Substantiation: This proposal provides data that is missing from the present NEC relating to fill criteria for single conductor cables in solid bottom cable trays. The data provides significant safety factors by reducing allowable fill to 50 percent of that required for ladder and ventilated trough.
Panel Meeting Action: Reject
Panel Statement: The submitter implies that the 50% fill limitation will provide a significant safety factor. This is not substantiated by technical data.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-198 Log #3452 NEC-P08 **Final Action: Reject**
(Table 392.10(A))

Submitter: Richard J. Buschart, Cable Tray Institute
Comment on Proposal No: 8-284
Recommendation: This proposal should be accepted.
Substantiation: This proposal provides data that is missing from the present NEC relating to fill criteria for single conductor cables in solid bottom cable trays. The data provides significant safety factors by reducing allowable fill to 50 percent of that required for ladder and ventilated trough cable tray.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-197.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-199 Log #1386 NEC-P08 **Final Action: Accept in Principle**
(392.10(A)(1))

Submitter: Brenda A. Carter Bad Axe, MI
Comment on Proposal No: 8-287
Recommendation: Continue to accept the proposal.
Substantiation: Whether single conductor cables are required to be installed in a single layer or are permitted to be stacked in multiple layers or bundled is not clear in this Article. There is a provision in 392.8(E) to permit bundling of single conductor cables sizes 1/0 through 4/0. If multiple cable layers and bundling is permitted for sizes 1000 kcmil or larger, then in 392.10(A)(1) it makes no sense to require the width of the cable tray to be not less than the sum of the cable diameters.

When mixing multiconductor cables with single conductor cables, all size 4/0 and larger, 392.9(A)(1) requires all cables to be installed in a single layer. This tells me that bundling of size 1000 kcmil and larger single conductor cables is not permitted where multiconductor cables are also present in the same cable tray. If cables size 1/0 through 3/0 are present in the cable tray with single and multiple conductor cables size 4/0 and larger, 392.9(A)(3) requires all cables size 4/0 and larger to be installed in a single layer. It seems that cables 250 kcmil and larger are only permitted to be installed as bundles when only single conductor cables are installed in the cable tray. The rules regarding installation of multiconductor and single conductor cables in cable trays needs to be made clear. By accepting this proposal, the Panel has taken a step towards making the rules more understandable. I have no objection to including in 392.10(A)(1) the last sentence of 392.8(E) to address Mr. Griffith's concern about bundled sets of cable, but then it seems unnecessary to require the minimum cable tray width to be not less than the sum of the diameters of all of the cables.
Panel Meeting Action: Accept in Principle
Revise text in Proposal 8-287, 392.10(A)(1), to read:
(1) Where all of the cables are 1000 kcmil or larger, the sum of the diameters of all single conductor cables shall not exceed cable tray width, and the cables shall be installed in a single layer. Conductors that are bound together to comprise each circuit group shall be permitted to be installed in other than a single layer.
Panel Statement: In the substantiation for this comment the submitter agreed to the placement of the last sentence to 392.8(E) in the language of the proposal. These changes also satisfy the concerns Mr. Griffith expressed on Proposal 8-287.
The additional wording addresses the cable installation requirements of 392.8(D) and (E).
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-200 Log #2084 NEC-P08 **Final Action: Reject**
(392.10(A)(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 8-287
Recommendation: Reject the proposal.
Substantiation: The proposal is in direct conflict with the requirement in 392.8(D) requiring paralleled make-ups to employ circuit groups in order to reduce reactance and the resulting current imbalance. This rule is intended to establish the maximum fill on the tray, and not how conductors are to be configured within the tray. The new wording also conflicts with its parent wording in 392.10, which expressly recognizes the even distribution of either "single conductors" or "conductor assemblies" across the tray. Since this language appears in a section focused entirely on single conductor cables, the only conductor assemblies that could be covered here are single conductors arranged in circuit groups. These groups will be bound in triangular of square layouts, but the total fill in the tray at any cross section will still be governed, for calculation purposes only, based on a single layer.
Panel Meeting Action: Reject
Panel Statement: See panel statement and action on Comment 8-199.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

8-201 Log #3445 NEC-P08 **Final Action: Reject**
(392.10(C) (New))

Submitter: Richard J. Buschart, Cable Tray Institute
Comment on Proposal No: 8-288
Recommendation: This proposal should be accepted.
Substantiation: This proposal provides data that is missing from the present NEC relating to fill criteria for single conductor cables in solid bottom cable trays. The data in this proposal provides significance in fill criteria.
Panel Meeting Action: Reject
Panel Statement: The comment lacked the necessary technical data to support it.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 396 — MESSENGER SUPPORTED WIRING

7-164 Log #1091 NEC-P07 **Final Action: Accept**
(396.12)

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute
Comment on Proposal No: 7-208
Recommendation: Reject the Proposal.
Substantiation: This proposal should be rejected. The submitter has provided no technical substantiation for the change. In certain instances, the messenger is permitted to be a current carrying conductor. For example, the Exception to 225.4 and Exception No. 2 to 250.184(A) make it clear that a bare messenger

conductor is permitted to be a current carrying conductor for certain conditions. Acceptance of this proposal would create a conflict with other provisions of the Code.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-165 Log #2392 NEC-P07 **Final Action: Accept**
(396.12)

Submitter: James M. Daly, General Cable
Comment on Proposal No: 7-208
Recommendation: The Proposal should be Rejected.
Substantiation: The material in the second sentence is not within the scope of CMP 7; it is within the scope of CMP 4 or CMP 5.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-166 Log #1292 NEC-P07 **Final Action: Reject**
(396.12(B))

Submitter: James M. Naughton, IBEW
Comment on Proposal No: 7-208
Recommendation: Panel 7 should continue to Accept in Principle in part.
Substantiation: This comment is the work of a task group from Panel 4 assigned to recommend an action, by direction of the Technical Correlating Committee.

Panel 7 should continue to accept only the very small part of the proposal as indicated in the Panel Action. The submitter fails to recognize the effect that snow, sleet, and ice would have on the messenger, if the messenger was used as the equipment grounding conductor, as suggested in his substantiation. If the messenger wire fails, there would be no indication of this at the service until a fault occurred and the path back to the utility company source is open.

Losing the neutral or grounded conductor would affect the operation of the equipment where any imbalance occurred between the phase conductors where neutral current on the grounded conductor would normally be present. Without the grounded messenger wire, an imbalance would cause a multi-wire branch circuit to operate improperly and, clearly, indication a problem with the circuit.
Panel Meeting Action: Reject
Panel Statement: Panel 7 agrees with Panel 5 in the rejection of this proposal.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-167 Log #2934 NEC-P07 **Final Action: Accept**
(396.12(B))

Submitter: Barry Bauman, Alliante Energy / Rep. American Society of Agricultural Engineers
Comment on Proposal No: 7-208
Recommendation: Delete: The messenger shall not be used as a current carrying conductor.
Substantiation: There was no technical substantiation provided in the proposal to prohibit the use of the messenger as a current carrying conductor for all installations.

The messenger is being used safely and effectively as a current carrying conductor in hundreds of thousands of installations.

In a typical installation, the messenger is a grounded-neutral effectively providing an equipment/system ground and carrying neutral current. When there is an open in the messenger resulting in the loss of grounding, the customer becomes aware of the open due to the change in voltage applied to equipment connected phase-to-neutral.

When the messenger is used as an equipment ground and a separate wire is used as the neutral, the indicator of a lost equipment ground is lost.

The prohibition of the use of the messenger as a current carrying conductor should not be a general rule in Article 396. Any limitations on the use of the messenger as a current carrying conductor should be application specific. An example of an appropriate restriction can be found in 250.32(B)(1).
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-168 Log #3334 NEC-P07 **Final Action: Accept**
(396.12(B) (New))

Submitter: C. Douglas White, Center Point Energy
Comment on Proposal No: 7-208
Recommendation: The Panel should reconsider its initial action on this proposal and reject the proposal in its entirety.
Substantiation: This comment is being submitted at the direction of Panel 5 Chairman. The exception to 225.4 and Exception No. 2 to 250.184(A) specifically permit bare neutral messenger wire cable assemblies to be current carrying conductors.
Panel Meeting Action: Accept
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-169 Log #3358 NEC-P07 **Final Action: Reject**
(396.12(B))

Submitter: Donald W. Zipse, Zipse Electrical Engineering, Inc.
Comment on Proposal No: 7-208
Recommendation: The Panel has it correct.
Substantiation: The panel members are to be commended for their astute, perceptive judgment in accepting this next step in the development of an electrical safe electrical system. The first step was the required 4 wire for house trailers, then 4-wire for marines and finally 4-wire ranges and dryers. Now you have made another step forward to a safer Code by not permitting a single conductor to be both a current carrying conductor and an equipment-grounding conductor while also being a messenger.
Panel Meeting Action: Reject
Panel Statement: Panel 7 agrees with Panel 5 in the rejection of this proposal.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

7-171 Log #2115 NEC-P07 **Final Action: Reject**
(396.12(B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 7-208
Recommendation: Accept the proposal in principle and in part. Accept the language restricting the use in hoistways, and accept the principle of limiting the systems that can run on messenger cable. Reject the limitation for all use of the messenger as a grounded circuit conductor in favor of allowing it only where permitted in Article 250, as follows: "The messenger shall not be used as a current-carrying conductor unless used as a grounded conductor in accordance with 250.32(B)(2)."
Substantiation: This proposal in the form accepted by CMP 7 would effectively nullify 250.32(B)(2) on overhead distributions. The substantiation that accompanies the proposal is entirely rooted in system grounding arguments. The proposal has nothing to do with the unique characteristics of messenger-supported wiring, and therefore should not be entertained in this article. In fact the proposal submitter has tried to nullify provisions in Article 250 that allow for multiple connections from equipment grounding conductors to grounded circuit conductors for many years, without success. Unless there is some characteristic of messenger-supported wiring that makes it worthy of being treated differently from any other wiring method, such as rigid nonmetallic conduit, for which a 250.32(B)(2) system could be arranged, CMP 7 should leave this argument to CMP 5 where it belongs. This application has been in routine use since the earliest days of the NEC. See, for example, the NFPA staff comments in the NEC Handbook at 225.4.
Panel Meeting Action: Reject
Panel Statement: Panel 7 agrees with Panel 5 in the rejection of this proposal.
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 398 — OPEN WIRING ON INSULATORS

19-3 Log #579 NEC-P19 **Final Action: Reject**
(398.12)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 7-210
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 19 for action in Article 547. This action will be considered by Code-Making Panel 19 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Reject
Panel Statement: The proposed text is not necessary, because the CMP 19 action on Proposal 19-8 prohibits the use of open wiring on insulators in agricultural buildings described in 547.1.
Number Eligible to Vote: 8
Ballot Results: Affirmative: 8

7-170 Log #2461 NEC-P07 **Final Action: Accept**
(398.12)

Submitter: Wayne A. Lilly Bridgewater, VA
Comment on Proposal No: 7-209
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:
"398.12 Uses Not Permitted.
Open wiring on insulators shall not be installed where concealed by the building structure."
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
The panel reinstates 398.10 and 398.12, which were modified based on the action of the Technical Correlating Committee on Proposal 7-209 to read as follows: "398.10 Uses Permitted. Open wiring on insulators shall be permitted only for industrial or agricultural establishments on systems of 600 volts, nominal, or less, as follows:
(1) Indoors or outdoors
(2) In wet or dry locations
(3) Where subject to corrosive vapors
(4) For services.
398.12 Uses Not Permitted. Open wiring on insulators shall not be installed where concealed by the building structure."
Number Eligible to Vote: 15
Ballot Results: Affirmative: 14
Vote Not Returned: 1 ANASTASI

ARTICLE 400 — FLEXIBLE CORDS AND CABLES

6-61 Log #1034 NEC-P06 **Final Action: Reject**
(400.5)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 6-78
Recommendation: This proposal should have been accepted rather than accepted in part.
Substantiation: The panel statement was incorrect on two points. FIRST, Table 400.5 contains all of the most commonly used flexible cords, many of which are seldom used in households. "J" types and appliance cords are commonly used in households, but the hard- and extra-hard-usage types are commonly used in commercial, industrial, and manufacturing applications, including hazardous locations as permitted in numerous articles of Chpater 5 and on industrial machinery. In fact, a major portion of Table 400.5(A) is reproduced in NFPA 79. These cords are often applied in ambient temperatures over 30 degrees C, so temperature correction information is needed. SECOND, although Table 400.5(B) may not show any flexible cable (or cord) types rated over 90 degrees C, According to the UL listing guide (General Information Directory - the one most widely used by inspectors and other users in the field), all cords not specifically mentioned (in a list in the guide which includes none of the types in TAble 400.5(B)) are rated "60, 75, 90, or 105" degrees C. Many of the cord types in Table 400.5(A) are ONLY rated 90 or 105 degrees C and are not available in 60 or 75 degree ratings. (Types SPE-1, SPE-2, SPE-3. SVE, SVEO, SVEOO, SJE, SE, SEO, HPD, HPN, HSJ, HSJO, and HSJOO are a few examples.) Users of the cords know this because they have the cord to look at, and as noted in the substantiation for the proposal, listed cords without temperature markings are rated at 60 degrees C and other ratings must be marked on the cord. The information from product standards cited here is critical to proper application of the ampacity tables according to the second sentence of 400.5. (Paragraph) One other point: The panel statement said "Table 400.5(A) temperature ratings have nothing to do with ampacity which is based on 60 degrees." This seems to be confusing the ambient temperature upon which the table is based with the temperature rating of the cords or perhaps the temperature ratings of terminations. Many of the cords in Table 400.5(A) are rated 60 degrees C, and many have other ratings as has been demonstrated. ALL of the ampacities in Table 400.5(A) are based on 30 degree C ambient. According to 110.14(C), 60 degree termination ratings will apply from Table 310.16 unless the terminals (not the cords) are marked otherwise. The panel should note that the ampacities under Column B of Table 400.5(A) correspond to the 60 degree ampacities from Table 310.16, so terminal ratings will not be a limiting factor in most cases.
Panel Meeting Action: Reject
Panel Statement: The temperature rating on cords, unlike other wire types, has often more to do with environmental conditions than ampacity. Allowing a higher ampacity could result in unsafe use when connected to lower temperature rated connectors as is often done with cords in household, commercial, or industrial environments. The "E" cords have higher temperature ratings to demonstrate that they can withstand temperature environments above 60 degrees C (as can other cord types). The "H" cords, because of their intended application as heater cords, already have higher ampacities in Table 400.5(A).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-62 Log #3101 NEC-P06 **Final Action: Accept**
(400.5)

Submitter: Kenneth E. Vannice, Leviton/NSI-Colortran / Rep. United States Institute for Theatre Technology Engineering Comm.
Comment on Proposal No: 6-78
Recommendation: Continue to Accept in Part by including the proposed changes as modified by the Panel.
Substantiation: We agree that guidance on this temperature issue is necessary. As we were instrumental in adding Table 400.5(B), we understand why the Panel excluded Table 400.5(A). We agree that the reference to the correction factors from Table 310.16 are appropriate for Table 400.5(B). We believe that the Panel's statement falls short on the temperature subject with respect to 400.5(A). Millions of feet of Type S extension cord is used in trade show exhibits, on theatre stages, on motion picture outdoor locations and similar places to dismiss this issue as merely household use. We understand that Table 400.5(A) is based on 60 degree C cord. Cords with higher temperature ratings are readily available. We suggest that these higher temperature ratings provide the method for correcting for the higher ambient temperature. For instance, a 75 degree C rated cord could be used when the ambient is up to 45 degree C. Furthermore, the last sentence of the Panel's statement is missing the issue. There exists 105 degree C rated cord, but the NEC does not acknowledge it. It should be treated as if it were 90 degree C cord.

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

6-63 Log #3653 NEC-P06 **Final Action: Reject**
(400.7(12))

Submitter: Stephen W. McCluer, American Power Conversion Corp
Comment on Proposal No: 6-84
Recommendation: Add:
(12) Interconnection between multiple bays of a single system of listed utilization equipment, including bays that are not in one continuous line-up.
Substantiation: A single piece of listed IT equipment can consist of many racks or cabinets of equipment powered by interconnecting cables. In some cases the equipment are not in a continuous line-up, in which case the interconnect cables might be run in ladder racks and exposed. This proposal was submitted because of experience with inspectors who rejected equipment with cable type SO or SOW in cable troughs or ladder racks for such applications. They didn't know if it could be covered by 400.7(6) and/or 645.5(C). This proposal would clarify that exposed interconnect cable between bays of listed IT equipment are not premises wiring and are acceptable.
Panel Meeting Action: Reject
Panel Statement: Flexible cords and cables are not intended to replace permanent wiring. If the submitter wishes to address IT applications, it is suggested that these concerns be submitted as proposals for change to Article 645.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-64 Log #101 NEC-P06 **Final Action: Accept in Part**
(400.7(A))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 6-85
Recommendation: Accept the proposal or alternatively delete (4), (5), (9), and (11).
Substantiation: As noted in the proposal and the panel comment, Chapters 5 and 6 modify this section and, therefore, 501.4(A)(2), (B)(2), 501.11, 502.4(A)(1)(e), 502.4(B)(2), 503.3(1)(2), 550.10(B), 553.7(B), and 555.13(A)(2) do not have to be noted in a laundry list of uses permitted.
Panel Meeting Action: Accept in Part
The panel accepts the recommendation to accept the original proposal (6-85) and rejects the alternate deletions.
Panel Statement: The action meets the submitter's request.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-65 Log #571 NEC-P06 **Final Action: Accept**
(400.7(C))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-88a
Recommendation: The Technical Correlating Committee directs the Panel to clarify the use of SI units according to 90.9 of the NEC and 3.2.7 and Annex C of the NEC Style Manual. This action will be considered by the Panel as a Public Comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the recommendation of the TCC, but the action on Comment 6-66 has resolved the issue.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-66 Log #1090 NEC-P06 **Final Action: Accept**
(400.7(C))

Submitter: Neil F. LaBrake, Jr., Niagara Mohawk, a National Grid Company / Rep. Edison Electric Institute
Comment on Proposal No: 6-88a
Recommendation: Reject the Proposal.
Substantiation: This proposal should have been rejected. This should be part of a product standard and is not part of the premise wiring system.
The integrity of the electrical safety system is anchored in the systematic integration of the NEC, product safety standards, installation inspection and product testing. Any activity to weaken one component will weaken the entire process. If product safety issues were usurped by the NEC, the product safety standard process would be weakened resulting in the entire process being weakened.
Edison Electric Institute's position is that the requirements for listed end-use electrical devices that are not installed as part of the permanent premises wiring system are best covered by the appropriate product standard. It is not the NEC's intent or scope to set requirements to be provided as part of a listed end-use electrical device that would typically be purchased by the after market consumer. EEI supports the entire electrical safety system that integrates product standards, installation standards, product testing and evaluation, electrical inspection, manufacturer's products, qualified electrical installation and maintenance, electric supply system characteristics, and the owner's use and operation. Covering product standards in the installation standard such as the NEC could negate the responsibility of the appropriate product standard and adversely impact the entire process.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-67 Log #2393 NEC-P06 **Final Action: Reject**
(400.7(C))

Submitter: James M. Daly, General Cable
Comment on Proposal No: 6-88a
Recommendation: The Proposal should have been Accepted in Part.
Change "2.44 m (8 ft)" to "7.5 m (25 ft)".
Substantiation: This revised text will address the comments expressed in the Negative ballots and will also address the Technical Correlating Committee comment. In accordance with the NEC Style Manual, the correct SI unit for 8 ft is 2.5 m, not 2.44 m.
Panel Meeting Action: Reject
Panel Statement: The panel action on Comment 6-66 has deleted the new material entirely. Article 400 covers the uses for flexible cords and cables. The panel now believes that Article 406 would be a more appropriate place for this issue to be addressed. Article 406 is not within the scope of CMP 6.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-68 Log #2557 NEC-P06 **Final Action: Accept**
(400.7(C))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 6-88a
Recommendation: NEMA does not agree with the panel action to accept the proposal and supportss the negative comments of M. Friedman, Mr. Komassa and Mr. Wetherell.
Substantiation: NEMA members provide these products to the industry with no reported issues with longer power supply cords. Manufacturers currently are allowed by UL standard 1363, 10.1.4 to provide cord lengths up to 25 ft in length.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-69 Log #3119 NEC-P06 **Final Action: Reject**
(400.7(C))

Submitter: Kenneth E. Vannice, Leviton/NSI-Colortran / Rep. United States Instiute for Theatre Technology
Comment on Proposal No: 6-88a
Recommendation: Change 2.44 m (8 ft.) to 7.62 m (25 ft.).
Substantiation: As stated by Mr. Friedman and Mr. Wetherell, Listed 25 ft. assemblies are available. The 8 ft. length is not practical for use in Exhibit Halls and other Assembly occupancies.
Panel Meeting Action: Reject
Panel Statement: See panel action on Comment 6-66 and the panel action and statement on Comment 6-67.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-70 Log #374 NEC-P06 **Final Action: Accept in Principle**
(400.7(C)(3))

Submitter: Gregory J. Steinman, Thomas & Betts Corporation
Comment on Proposal No: 6-88a
Recommendation: Delete the following text:
~~(3) The overall length of the assembly shall not exceed 2.44m (8 ft).~~
Substantiation: Delete the length requirement. See the Mr. Friedman's comment. These products can include cord lengths up to 25 ft with no reported field problems. Shorter lengths only result in users plugging multiple units in series or using extension cords.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action on Comment 6-66 and the panel action and statement on Comment 6-67.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-71 Log #572 NEC-P06 **Final Action: Accept**
(400.8)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-90
Recommendation: The Technical Correlating Committee directs that the panel clarify their actions and statements as Accepting one proposal is not a reason to Reject another 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 TCC direction. The panel should have accepted in principle the recommendation of Proposal 6-90. The panel statement reference to the panel action of Proposal 6-92 was valid because it better addressed the issue in the recommendation of Proposal 6-90. However, the panel has now reversed its decision. Refer to the panel action on Comment 6-75.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-72 Log #573 NEC-P06 **Final Action: Accept**
(400.8)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-91
Recommendation: The Technical Correlating Committee directs that the panel clarify their actions and statements as Accepting one proposal is not a reason to Reject another 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 TCC direction. The panel should have accepted in principle the recommendation of Proposal 6-91. The panel statement reference to the panel action of Proposal 6-92 was valid because it better addressed the issue in the recommendation of Proposal 6-91. However, the panel has now reversed its decision. Refer to the panel action on Comment 6-75.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-73 Log #574 NEC-P06 **Final Action: Reject**
(400.8(4) Exception)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-92
Recommendation: The Technical Correlating Committee directs that the action on this Proposal be rewritten to comply with 2.6.1 of the NEC Style Manual regarding the use of Exceptions made to items within a numbered list.
This action will be considered by the Panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Reject
Panel Statement: The direction of the TCC is no longer necessary. See panel action on Comment 6-75.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-74 Log #1271 NEC-P06 **Final Action: Accept in Principle**
(400.8(4) Exception)

Submitter: Joel A. Rencsok, Three Phase Engineering
Comment on Proposal No: 6-92
Recommendation: Change the reference from 368.8(B) to 368.56(B).
Substantiation: The 2002 reference has been revised during the 2005 code cycle.
Panel Meeting Action: Accept in Principle
Panel Statement: If the change occurs in Article 368, the reference will be updated by NFPA staff.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-75 Log #3228 NEC-P06 **Final Action: Accept**
(400.8(4) Exception)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 6-92
Recommendation: The Panel should reject this proposal.
Substantiation: The exception is located to provide a deviation from the requirement that flexible cords and cables not be attached to building surfaces. With the primary uses of flexible cords and cables being specific equipment requiring flexibility, connection of portable equipment, or equipment that may require frequent interchange, allowing flexible cords and cables to be permanently attached to the building structure creates a hazardous condition. By allowing the cables to be attached to building structure without clear guidelines regarding strain relief, the probability of cord failure is imminent. The rule to establish a "suitable tension take-up device" is ambiguous, and is, therefore, left undefined.
We agree with the comments expressed in Mr. Laider's negative vote. At the most, these items should be treated as separate exceptions.
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: 11

6-76 Log #94 NEC-P06 **Final Action: Reject**
(400.8(6) Exception (New))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 6-94
Recommendation: Accept the proposal.
Substantiation: Panel statement that flexible cord is not to be used for permanent wiring is belied by uses which appear to be permanent in view of no definition for permanent wiring. For example, permanently connected cords for lighting fixtures, floating structures, docks, elevators, cranes and hoists, flexibility.
Panel Meeting Action: Reject
Panel Statement: The submitter is correct that code allows the use of cord as permanent wiring in specific applications. However, it is not considered a replacement for a Chapter 3 wiring method.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-77 Log #575 NEC-P06 **Final Action: Accept**
(400.14)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-95
Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting regarding the unlimited length of the cord in the requirement. This action will be considered by the panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the TCC to reconsider.
Add a new second paragraph to 400.14 to read as follows:"In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, flexible cords and cables shall be permitted to be installed in aboveground raceways that are no longer than 15 m (50 ft) to protect the flexible cord or cable from physical damage. Where more than three current-carrying conductors are installed within the raceway, the allowable ampacity shall
be reduced in accordance with Table 400.5."
Panel Statement: The panel has added a limitation of 15 m (50 ft) of raceway to the recommendation of Proposal 6-95 to address the comment expressed in voting.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
KENT: Allowing the use of flexible cord in conduit for physical protection is one thing, but in lengths of 15 meters (50 feet) it effectively becomes a wiring method. Use of the term "in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation" is over used. Perhaps, in some industrial establishments there is proper safeguarding and inspection, but in most of the smaller establishments this is simply not the case. At the 15-meter (50 feet) length, the wiring method

should be one already considered a permanent wiring method. This change goes well beyond protection of a section of cord from physical damage which is the only reason cord should be allowed to pass through conduit.

LAIDLER: The new second paragraph does not go far enough in specifying the circumstances under which this method is acceptable. First, there is no definition of the term "industrial establishment." Second, it does not specify the nature of the conditions in which the fifty feet of flexible cord or cable can be used beyond situations where physical protection is needed. This could result in flexible cord or cable being used in lieu of fixed wiring in installations which require 50 feet or less. Additionally, there is essentially no way to universally control conditions of installation and maintenance by qualified persons thus furthering the potential for non-compliance.

6-78 Log #2134 NEC-P06 **Final Action: Reject**
(400.14)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc. / Rep. Massachusetts Electrical Code Advisory Committee
Comment on Proposal No: 6-95
Recommendation: Blend the stronger parts of Proposals 6-94 and 6-95 together with a length restriction to address the comments in the voting, as follows:
Add a new second paragraph to 400.14:

Flexible cords and cables shall be permitted to be installed in raceways not longer than 15 m (50 ft) in length where required to protect the flexible cord or cable from physical damage. The ampacity of the conductors within a raceway shall be adjusted in accordance with Table 400.5 based on the total number of current-carrying conductors within the raceway, and then further derated by a factor of 0.8, or the ampacity shall be calculated in accordance with 310.15(C). The raceway shall be exposed over its entire length.

Substantiation: The panel action is an important first step. This comment incorporates a length restriction on the use of the new provision, in order to address concerns in the voting and by the TCC. The 50 ft limitation correlates with the maximum length of free cord permitted under NFPA 79 (at 14.1.5.2), which is the major type of installation that would be expected to use this allowance routinely. The wording addresses how to make the calculations if more than a single cord runs through a raceway, and incorporates the 0.8 further derating factor because the ampacity of a cord in a raceway cannot be determined directly from the Article 400 ampacity tables, which assume the use of cord in free air. The 0.8 factor is more fully substantiated in Proposal 6-94. This wording also assures the raceway will be exposed, which also improves air circulation. The only restriction in Proposal 6-95 on this topic was to prohibit the use of cord underground. Very few installations would be so tempted, and that wording leaves open the possibility of sleeving cords through raceways in walls and ceilings, which should not be the point of this allowance. Finally, this commit omits the industrial/engineering supervision restriction. We believe that the NEC should, wherever possible, not include ever more provisions that require engineering and an industrial location to implement. We believe the wording submitted with this comment adequately covers the engineering issues, and that in this form it will be safe to apply in other occupancies as well.
Panel Meeting Action: Reject
Panel Statement: The submitter has changed the coverage from industrial establishment to general usage. This restriction should be limited to industrial environments under the supervision of qualified personnel. See panel action and statement on Comment 6-77.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

6-79 Log #2367 NEC-P06 **Final Action: Reject**
(400.14)

Submitter: James M. Imlah, City of Hillsboro
Comment on Proposal No: 6-95
Recommendation: Delete the following text:

~~Add a new second paragraph to 400.14:~~

~~In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, flexible cords and cables shall be permitted to be installed in above ground raceways to protect the flexible cord or cable from physical damage. Where more than three current carrying conductors are installed within the raceway, the allowable ampacity shall be reduced in accordance with Table 400.5.~~

Substantiation: The proposal to change this article needs should be rejected. 400.14 states that cords shall be protected from physical damage. The substantiation is "intended to permit physical protection against physical damage, so the cord should be allowed in a raceway system." If there is the possibility of damage, as related in the substantiation, then the problem may be an installation problem with the wiring method being used, maybe an alternate method should be installed that will provide the needed "physical protection." If this installation is connected to utilization equipment, this is not a temporary installation as permitted by 527.4(B) and (C), and 400.8 NEC uses not permitted should apply, then an alternate wiring method should be installed to supply the equipment. There has been no substantiated information as to the effects of pulling extension, and meeting support requirements of 314.17(B), for cords or cables installed in raceways, in boxes, or panels when in a raceway as per 400.10. Even 400.8(6) states that cord shall not be installed in raceways, except as permitted in this "Code", and there does not appear to be any proposals to remove this reference, thereby, accepting this change may create additional confusion.
Panel Meeting Action: Reject
Panel Statement: The panel continues to support the original proposal and substantiation but with a limitation on raceway length of 15 m (50 ft). See panel action and statement on Comment 6-77.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
KENT: See my Explanation of Negative Vote on Comment 6-77.
LAIDLER: See my Explanation of Negative Vote on Comment 6-77.

6-80 Log #3120 NEC-P06 **Final Action: Reject**
(400.14)

Submitter: Kenneth E. Vannice, Leviton/NSI-Colortran / Rep. United States Instiute for Theatre Technology
Comment on Proposal No: 6-95
Recommendation: Reject this proposal.
Substantiation: Our understanding is that the ampacities of portable cord are based on the ability to transfer heat from its jacket directly to fee air. Any attempt to enclose portable cord in raceway would violate this free transfer and require different ampacity values including three current-carrying conductors or less.
Panel Meeting Action: Reject
Panel Statement: Where three or fewer current-carrying conductors are used, the ampacity of cords in Table 400.5(A) are comparable with those in Table B.310.1.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
KENT: See my Explanation of Negative Vote on Comment 6-77.
LAIDLER: See my Explanation of Negative Vote on Comment 6-77.

6-81 Log #3227 NEC-P06 **Final Action: Reject**
(400.14)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 6-95
Recommendation: The Panel should reject this proposal.
Substantiation: As worded, the proposal allows unlimited use of flexible cords and cables in conduit systems when installed in industrial establishments. Revised wording or further review is necessary. It is our concern that "industrial established" has been a catchall phrase used to allow non-standard installation practices. While "industrial establishments" possess unique installation obstacles, further substantiation should be provided to demonstrate the need to revise 400.14.

Furthermore, we agree with the comments expressed in Mr. Laider's negative vote. There permission granted by this new paragraph could lead to the installations that provide a lesser degree of safety.

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 6-79.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
KENT: See my Explanation of Negative Vote on Comment 6-77.
LAIDLER: See my Explanation of Negative Vote on Comment 6-77.

6-82 Log #3105 NEC-P06 **Final Action: Accept**
(400.15)

Submitter: Kenneth E. Vannice, Leviton/NSI-Colortran / Rep. United States Institute for Theatre Technology Engineering Comm.
Comment on Proposal No: 6-97
Recommendation: Continue to reject this proposal.
Substantiation: This type of equipment has not been evaluated for use in entertainment venues. At this point in the process there is no way to evaluate this equipment and insert material in Chapter 5 to make corrections if the equipment is found to not be appropriate in these venues. For instance, what happens when this device is on the load side of a SCR dimmer? We would hope that the Technical Correlating Committee would forward this comment to Panels 2 and 10 who have been directed to consider this proposal.
Panel Meeting Action: Accept

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

(Note: The sequence no. 6-83 was not used.)

10-76 Log #576a NEC-P10 **Final Action: Accept**
(400.15)

Note: The Technical Correlating Committee disagrees with the panel that this is outside of the Scope of Article 240. Article 240 does include protection for flexible cords and this issue would be within the Scope of CMP 10 if they choose to take some action during future code cycles.
Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-97
Recommendation: The Technical Correlating Committee directs this Proposal be referred to Code-Making Panels 2 and 10 for consideration in their articles. This proposal will be considered by Code-Making Panels 2 and 10 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to review Proposal 6-97 for consideration in our Articles.
Performance characteristics of AFCIs and LCDIs are outside the Scope of articles 240 and 780.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-77 Log #3105b NEC-P10 **Final Action: Accept**
(400.15)

Submitter: Kenneth E. Vannice, Leviton/NSI-Colortran / Rep. United States Institute for Theatre Technology Engineering Comm.
Comment on Proposal No: 6-97
Recommendation: Continue to reject this proposal.
Substantiation: This type of equipment has not been evaluated for use in entertainment venues. At this point in the process there is no way to evaluate this equipment and insert material in Chapter 5 to make corrections if the equipment is found to not be appropriate in these venues. For instance, what happens when this device is on the load side of a SCR dimmer? We would hope that the Technical Correlating Committee would forward this comment to Panels 2 and 10 who have been directed to consider this proposal.
Panel Meeting Action: Accept
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

10-78 Log #2850a NEC-P10 **Final Action: Reject**
(400.15)

Submitter: Edward A. Schiff, Technology Research Corp.
Comment on Proposal No: 6-97
Recommendation: The CMP should accept in principle in part but revise the text as follows: Proposed 400.15:
Indoor Extension Cords: All SPT-2 and SPT-3 extension cords shall be provided with factory installed arc fault circuit interrupter (AFCI) or leakage current detection and interruption (LCDI) protection. The AFCI or LCDI protection shall be an integral part of the attachment plug or located within 300 mm (12 in.) of the attachment plug.
Substantiation: The submitter wishes to express his appreciation to the CMP for their time and consideration. A serious hazard continues to exist which result in 40 needless deaths per year. I have provided a table highlighting some of the incidents that have occurred since this proposal was submitted.
The revised wording better defined the type of cord and allows for AFCI technology (see Proposal 6-96) which is designed to prevent the same type of occurrence. This proposal was referred to Panel 2 for consideration in Article 210 entitled Branch Circuits and to Panel 10 for consideration in Article 240 entitled Overcurrent Protection. Although the location in the NEC is not as critical as the incorporation, the submitter encourages Panel 6 to reconsider the incorporation into Article 400 for the following reasons:
1. This is a construction issue for flexible cords.
2. Panel 6 took action on a virtually identical proposal (6-138) submitted to the 1999 NEC. The proposal was rejected based on the newness of the technology at that time, this type of cord is permitted for manufacture and use, and concerns on how the protection against combustion would be achieved. Since that time, there have been millions of LCDI protected cords used on a variety of applications, UL Standard 1699 has been created with performance requirements for this type of device, and hundreds of deaths from extension cord fires have occurred.
3. An AFCI or LCDI protected extension cord is not part of the permanent branch circuit (Article 210 and is not an overcurrent device (Article 240).
The submitter is providing an independent study on the economic impact of incorporating this safety enhancement. The study does not put a value on loss of life just property and injury costs and still shows a positive economic impact to society. The CPSC has recently put a $5 million cost on a loss of a life. Based on 40 deaths per year, this would save society an additional $200,000,000.00
Extension cords are a major hazard in homes, offices, schools and institutions. Economic proven products exist that will prevent this needless loss of life, injuries and property damage.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: See panel statement on Comment 10-76.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12

2-177 Log #576 NEC-P02 **Final Action: Accept**
(400.15)

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 6-97
Recommendation: The Technical Correlating Committee directs this Proposal be referred to Code-Making Panels 2 and 10 for consideration in their articles. This proposal will be considered by Code-Making Panels 2 and 10 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
The panel accepts the direction of the TCC to consider the referred proposal and is rejecting the proposal.
Panel Statement: The definition proposed for LCDI's is not appropriate for Article 210, branch circuits.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

2-178 Log #2850 NEC-P02 **Final Action: Reject**
(400.15)

Submitter: Edward A. Schiff, Technology Research Corp.
Comment on Proposal No: 6-97
Recommendation: The CMP should accept in principle in part but revise the text as follows: Proposed 400.15:
Indoor Extension Cords: All SPT-2 and SPT-3 extension cords shall be provided with factory installed arc fault circuit interrupter (AFCI) or leakage current detection and interruption (LCDI) protection. The AFCI or LCDI protection shall be an integral part of the attachment plug or located within 300 mm (12 in.) of the attachment plug.
Substantiation: The submitter wishes to express his appreciation to the CMP for their time and consideration. A serious hazard continues to exist which result in 40 needless deaths per year. I have provided a table highlighting some of the incidents that have occurred since this proposal was submitted.
The revised wording better defined the type of cord and allows for AFCI technology (see Proposal 6-96) which is designed to prevent the same type of occurrence. This proposal was referred to Panel 2 for consideration in Article 210 entitled Branch Circuits and to Panel 10 for consideration in Article 240 entitled Overcurrent Protection. Although the location in the NEC is not as critical as the incorporation, the submitter encourages Panel 6 to reconsider the incorporation into Article 400 for the following reasons:
1. This is a construction issue for flexible cords.
2. Panel 6 took action on a virtually identical proposal (6-138) submitted to the 1999 NEC. The proposal was rejected based on the newness of the technology at that time, this type of cord is permitted for manufacture and use, and concerns on how the protection against combustion would be achieved. Since that time, there have been millions of LCDI protected cords used on a variety of applications, UL Standard 1699 has been created with performance requirements for this type of device, and hundreds of deaths from extension cord fires have occurred.
3. An AFCI or LCDI protected extension cord is not part of the permanent branch circuit (Article 210 and is not an overcurrent device (Article 240).
The submitter is providing an independent study on the economic impact of incorporating this safety enhancement. The study does not put a value on loss of life just property and injury costs and still shows a positive economic impact to society. The CPSC has recently put a $5 million cost on a loss of a life. Based on 40 deaths per year, this would save society an additional $200,000,000.00
Extension cords are a major hazard in homes, offices, schools and institutions. Economic proven products exist that will prevent this needless loss of life, injuries and property damage.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Reject
Panel Statement: The requirements proposed for extension cords are a Panel 10 issue.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

2-179 Log #3105a NEC-P02 **Final Action: Accept**
(400.15)

Submitter: Kenneth E. Vannice, Leviton/NSI-Colortran / Rep. United States Institute for Theatre Technology Engineering Comm.
Comment on Proposal No: 6-97
Recommendation: Continue to reject this proposal.
Substantiation: This type of equipment has not been evaluated for use in entertainment venues. At this point in the process there is no way to evaluate this equipment and insert material in Chapter 5 to make corrections if the equipment is found to not be appropriate in these venues. For instance, what happens when this device is on the load side of a SCR dimmer? We would hope that the Technical Correlating Committee would forward this comment to Panels 2 and 10 who have been directed to consider this proposal.
Panel Meeting Action: Accept
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

ARTICLE 404 — SWITCHES

9-113 Log #1589 NEC-P09 **Final Action: Accept**
(404.6(A))

Submitter: Alan Manche, Schneider Electric/Square D Co.
Comment on Proposal No: 9-80
Recommendation: The panel should amend 404.6(A) as follows to make the wording consistent with the change in 404.6(B):
(A) Single-Throw Knife Switches. Single-throw knife switches shall be placed so that gravity will not tend to close them. Single-throw knife switches, approved for use in the inverted position, shall be provided with a ~~locking device~~ integral mechanical means that ensures that the blades remain in the open position when so set.
Substantiation: As noted in the substantiation, the "locking device" is simply a mechanical means to keep the blades from engaging due to gravity moving them to a closed position. This is not the lockout means as required in other areas of the NEC such as 430.102 and 422.31. Keeping the blades in an open position has been overcome by "integral mechanical means," other than a mechanical locking device. Note also that the locking means is only required when the double-throw is mounted in the vertical position and when the single throw switch is mounted in an inverted position. The thought that this is a "lockout device" is not rational since the locking means is not required for the switches mounted in other orientations.
Mr. Sengupta provides and insightful observation that 404.6(A) also contains the wording "locking device." This comment proposes that the wording "locking device" be change in 404.6(A) to "integral mechanical means" in order to ensure consistency across both paragraphs of 404.6.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-114 Log #1590 NEC-P09 **Final Action: Accept**
(404.6(B))

Submitter: Alan Manche, Schneider Electric/Square D Co.
Comment on Proposal No: 9-80
Recommendation: The panel should continue to accept proposal 9-80 as amended by the panel.
Substantiation: As noted in the substantiation, the "locking device" is simply a mechanical means to keep the blades from engaging due to gravity moving them to a closed position. This is not the lockout means as required in other areas of the NEC such as 430.102 and 422.31. Keeping the blades in an open position has been overcome by "integral mechanical means," other than a mechanical locking device. Note also that the locking means is only required when the double-throw is mounted in the vertical position and when the single throw switch is mounted in an inverted position. The thought that this is a "lockout device" is not rational since the locking means is not required for the switches mounted in other orientations.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

2-180 Log #605 NEC-P02 **Final Action: Accept**
(404.8(c). (New))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-82
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-making Panel 2 for 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 location of switches for lighting is a design issue. The submitter did not provide substantiation that this is a safety concern.
Number Eligible to Vote: 13
Ballot Results: Affirmative: 13

9-115 Log #606 NEC-P09 **Final Action: Accept**
(404.8(B))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-87
Recommendation: The Technical Correlating Committee directs the panel to clarify their action with regard to the recommendation to change the Title. This action will be considered by the Panel as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel has rejected the underlying Proposal 9-85, which included the same topic. No title change to 404.8(B) is necessary.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-116 Log #2028 NEC-P09 **Final Action: Accept in Principle**
(404.8(B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-85
Recommendation: Accept the proposal in principle. Revise the new paragraph to read as follows:
"A multipole, general use snap switch shall not be permitted to be fed from more than a single circuit unless it is listed and marked as a two-circuit or three-circuit switch, or unless its voltage rating is not less than the nominal line-to-line voltage of the system supplying the circuits. The voltage to the same single-circuit snap switch shall not exceed 300 volts. A means to simultaneously disconnect the ungrounded conductors feeding a multipole snap switch shall be provided at the panelboard where the branch circuits originate."
Substantiation: If this type of provision is going to enter the NEC, it is time to address a long-standing innocuous use of multipole snap switches: the control of two 120-volt loads with a similar purpose and using a 277-volt two-pole (or three on a three-pole) switch. The entire voltage exposure is less than the switch rating, and the suggested language includes the disconnect concept in 210.7(C) for multi-circuit receptacles. The submitter has been cajoling various NEMA companies for almost twenty years to pursue the allowance in the product standard to produce such switches, to no avail. It is time to force the issue, or to invite public comment as to why such snap switches are not available.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-118.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11
Comment on Affirmative:
HARTWELL: The device industry still shows no inclination to mark two-pole switches "2-circuit", and thereby allow their use on two circuits with a total voltage spread within the switch rating. Representatives declared their willingness to act promptly if there were market demand. Unfortunately, I strongly suspect the lack of demand is a result of lack of knowledge, and not any lack of applications. In other words, installers are routinely installing these switches and inspectors are accepting them for want of any observable hazard. The panel discussion got needlessly bogged down in the advisability of providing a common discommecting means, as well as integrating the 346-volt snap switches recognized in 404.14(D). The second concern, in particular, does not apply to two-circuit applications on 208Y/120- or 120/240-volt distributions. Unless the industry responds over the next year, I expect to propose the following simplified proposal in the 2008 cycle:
"Insert a new 404.8(C) as follows:
(C) Multipole Snap Switches. A multipole, general use snap switch shall not be permitted to be fed from more than a single circuit unless it is listed and marked as a two-circuit or three-circuit switch, or unless its voltage rating is not less than the nominal line-to-line voltage of the system supplying the circuits."

9-117 Log #2029 NEC-P09 **Final Action: Accept**
(404.8(B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-86
Recommendation: Accept the proposal in principle. In the existing code, change "permanently installed barriers" to "identified, securely installed barriers".
Substantiation: Outlet box dividers as have been used for generations in conventional steel outlet boxes, especially 4-in. sq. boxes with notched mud rings designed to accept them, do not literally comply with the wording of this section. These dividers are available in manufacturers' catalogs, but do not always carry a specific listing for this purpose. Therefore the appropriate wording should be "identified" (see Article 100) and the wording should allow for field installation. This wording will satisfy the intent of the submitter.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-118 Log #2562 NEC-P09 **Final Action: Accept in Principle**
(404.8(B))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 9-85
Recommendation: Revise the proposal as follows by deleting the last sentence:
A multipole general use snap switch shall not be permitted to be fed from more than a single circuit, unless listed and marked as a two circuit or three circuit switch. ~~The voltage to the same single circuit snap switch shall not exceed 300 volts.~~
Substantiation: The substantiation states that a circuit feeding a single 300 volt device presents the same hazard as adjacent devices where the voltage between devices exceeds 300 volts. This is incorrect. The requirement for separation of devices with a voltage of more than 300 volts between devices is to prevent inadvertent contact with the terminals of <u>both</u> devices at the same time where 300 volts or greater is available between devices. This does not lead to the conclusion that any single electrical product rated more than 300 volts is unsafe. No substantiation has been provided that clearly identifies a particular hazard associated with a single snap switch rated more than 300 volts. A single snap switch rated more than 300 volts does not present a greater hazard then any other electrical device rated more than 300 volts. 347 volt snap switches are listed and already recognized in the code (see 404.14(D)).
Panel Meeting Action: Accept in Principle
Change the action on Proposal 9-85 to reject.
Panel Statement: The panel accepts the deletion of both the first and second sentence, which effectively rejects Proposal 9-85. The panel notes that the requirements in those sentences remain in effect because they are part of the restriction contained in the UL Guide Information.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-119 Log #2914 NEC-P09 **Final Action: Accept in Principle**
(404.8(B))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 9-85
Recommendation: The proposal should be accepted in part. Revise the proposal as follows by deleting the last sentence:
A multipole general use snap switch shall not be permitted to be fed from more than a single circuit, unless listed and marked as a two circuit or three circuit switch. ~~The voltage to the same single circuit snap switch shall not exceed 300 volts.~~
Substantiation: As the submitter of proposal 9-85, I agree with the NEMA Comment that states: The substantiation states that a circuit feeding a single 300 volt device presents the same hazard as adjacent devices where the voltage between devices exceeds 300 volts. This is incorrect. The requirement for separation of devices with a voltage of more than 300 volts between devices is to prevent inadvertent contact with the terminals of both devices at the same time where 300 volts or greater is available between devices. This does not lead to the conclusion that any single electrical product rated more than 300 volts is unsafe. No substantiation has been provided that clearly identifies a particular hazard associated with a single snap switch rated more than 300 volts. A single snap switch rated more than 300 volts does not present a greater hazard then any other electrical device rated more than 300 volts. 347 volt snap switches are listed and already recognized in the code (see 404.14(d)).
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-118.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-120 Log #2915 NEC-P09 **Final Action: Reject**
(404.8(B))

Submitter: David H. Kendall, Carlon
Comment on Proposal No: 9-86
Recommendation: This proposal should be accepted as written:
(B) Voltage Between Adjacent Devices. A snap switch shall not be grouped or ganged in enclosures with other snap switches, receptacles, or similar devices, unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts, or unless they are installed in enclosures equipped with permanently installed barriers <u>or listed outlet box dividers</u> between adjacent devices.
Substantiation: Panel 16 accepted similar proposals using the same language. See proposals 16-133, 16-190 and 16-226. In addition, UL is listing dividers. The new language makes it clear that a outlet box can be design with a preinstalled permanent divider (barrier) or that a field installed divider can be used as long as that divider is listed. This way the material used for the listed field installed divider will have been evaluated and would prevent from a combustible or inadequate material from being used.
Panel Meeting Action: Reject
Panel Statement: There are some steel dividers used in the market that are not "listed" products. Section 314.40 does not require metal boxes to be listed. See panel action and statement on Comment 9-117.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-121 Log #3515 NEC-P09 **Final Action: Reject**
(404.8(B))

Submitter: Henry A. Jenkins, Wake County, Inspections Development
Comment on Proposal No: 9-85
Recommendation: Change the title for the revised section to (B) Voltage Between Adjacent Devices or Within the Same Device.
Substantiation: The title for the revised section should be changed to (B) Voltage Between Adjacent Devices or Within the Same Device, since the old title would only apply to adjacent devices and not to the expanded coverage of voltage differences to a single circuit switch. Accept the remainder of the proposal without change.
Panel Meeting Action: Reject
Panel Statement: The panel has rejected the underlying Proposal 9-85, which included the same topic. No title change to 404.8(B) is necessary.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-122 Log #3028 NEC-P09 **Final Action: Accept**
(404.9(B) Exception)

Submitter: Dale Rooney, Municipality of Anchorage
Comment on Proposal No: 9-91
Recommendation: Accept the proposal.
Substantiation: The proposal amends an exception that only applies where no effective grounding means exists. Protection by GFCI should be allowed for switches as it is for receptacles under 406.3(D)(3)(c) and is likely to be for luminaires (see Proposal 18-69). This proposal will increase safety since a nonmetallic faceplate would only cover up any fault that may occur creating a hidden danger for anyone removing it for servicing, painting, wallpapering etc. A GFCI would open the circuit thereby identifying the problem and requiring its correction. This wiring method is over forty years old and at increased risk of faulting.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 1 Abstain: 1
Explanation of Negative:
CROUSHORE: The panel unanimously rejected Proposal 9-91 with the statement "GFCI devices are not intended to be a substitute for effective grounding." The comment does not provide any technical substantiation to address nor refute their prior action and, accordingly, the panel should reject the comment for the originally stated reason.
Comment on Affirmative:
HARTWELL: This action correlates nicely with the panel action on Proposal 18-69, which allows for the use of GFCI-protected, exposed metal luminaires for replacement purposes on circuits with no equipment grounding conductor. This was a controversial vote at the meeting, but the result should stand. It does not substitute GFCI for grounding and is consistent with actions taken in other panels.
Explanation of Abstention:
LEMAY: I abstain my vote on this comment for the following reason:
While there remains large numbers of buildings, primarily residential dwelling units without equipment grounding means present at switch box locations, the potential hazard is minimal.
One of the panel's substantiations for accepting this proposal/comment was that this modification would help protect personnel from electric shock during

a device failure if they chose to use stainless steel switch plates in bathrooms and that people were more frequently using conductive metal plates to improve decor.

People using plastic, ceramic, wood and other dielectric materials more so than metal plates to improve decor and, therefore, requiring the installation of a GFI breaker on the circuit when replacing a switch in a box with no grounding means is an excessive requiremnt.

Code panels are too often including code language which in effect deems the document a "design manual."

9-123 Log #2031 NEC-P09 **Final Action: Accept**
(404.9(B)(1))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-94
Recommendation: Reject the proposal.
Substantiation: This proposal represents a major change in the Code, with very thin substantiation. There is a fundamental difference in the level of hazard between a snap switch faceplate and a receptacle that is merely the point of origin for a quasi-branch circuit extension when it is in use. That is why the grounding continuity requirements for receptacles are more demanding than those for snap switches, and properly so. That is also why receptacle grounding requirements occur in Article 250.146 instead of Article 406. This proposal should not be accepted without far more extensive substantiation being provided than the anecdotal account provided in this case.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
OFFERDAHL: 404.9(B) states: "Snap switches, including dimmer and similar control switches, shall be effectively grounded...". Article 100 defines that effectively grounded is a ground connection of sufficiently low impedance and having sufficient current-carrying capacity to prevent the build-up of voltages that may result in undue hazards to connected equipment or to persons. In reviewing some of the existing switches, dimmer switches and occupancy sensors installations which are mounted on metal boxes setback 1/4 in. from the finished surface. I do not believe the ground path of the metal screws and connection with the yoke has the sufficiently low impedance path to facilitate the overcurrent device, if the switching device or metal faceplate became energized. Proposal 9-94 should have been accepted to clarify a low impedance path is needed. This is also consistent with Code-Making Panel 5's acceptance of new 250.147.

9-124 Log #2563 NEC-P09 **Final Action: Accept**
(404.9(B)(1))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 9-94
Recommendation: The panel should reject this proposal.
Substantiation: The existing requirement in 404.9(B)(1) insures that metal outlet box covers and screws will be effectively grounded. The grounding path is established by the switch mounting screws which engage the threads in the metal box and the head of the screw which is in contact with the switch yoke. The switch mounting screw provides a grounding path for the switch yoke and a metal cover or metal cover screws attached to the switch yoke.

The substantiation for this change is of a general nature and did not provide sufficient information to conclude that the proposed change would have prevented the incident. If the switch were installed properly the faceplate would have been grounded. The NEC requirements for bonding/grounding of faceplates was only recently enacted in the 1999 NEC. It is likely that the incident occurred due to an installation that was not in compliance with the current NEC requirements.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
OFFERDAHL: See my Explanation of Negative Vote on Comment 9-123.

ARTICLE 406 — RECEPTACLES, CORD CONNECTORS, AND ATTACHMENT PLUG (CAPS)

18-5 Log #2591 NEC-P18 **Final Action: Accept**
(406.2)

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 18-7
Recommendation: This proposal should continue to be rejected.
Substantiation: (Also see NEMA comment on Proposal 18-10). The documentation submitted with the proposal does not support adoption of the requirement for an integral thermal protector in receptacles. The first page of the substantiation cites causative factors that contribute to the development of abnormal heating and subsequent fires. While it may be accurate that these conditions are contributing factors to abnormal heating, there does not appear to be any information in the substantiation clearly linking these conditions to receptacle performance. In fact, page 2393-93 of the substantiation states "there very low failure rate indicates that electrical receptacles are highly reliable." Before a proposal of this type can be considered, there must be clear identification and substantiation of the problem and an equally clear explanation of how the proposed remedy solves the problem.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Abstain: 1
Explanation of Abstention:
WELLS: I am abstaining from voting on this comment because my company could be significantly effected by the results.

18-6 Log #1383 NEC-P18 **Final Action: Reject**
(406.2.Temperature-Sensor Circuit Interrupter (TSI) (as applied to receptacles) (New))

Submitter: Thomas J. D'Agostino, Firefighter Products, Inc.
Comment on Proposal No: 18-7
Recommendation: Add new definition as follows:

Temperature-Sensor Circuit Interrupter (TSCI) (as applied to receptacles): A device that is an integral part of a receptacle that is intended to provide protection from the effects of dangerous unsafe overheating conditions by recognizing characteristics unique to overheating such as deteriorated or improper conductor termination or overloading of the receptacle or attachment plug connections.

Renumber existing 406.2 and other sections as necessary.
Substantiation: This is a companion comment to other comments for Proposal Nos. 18-10 and 18-15. This term is proposed to be defined in Article 406, at this time, as an introduction of this new safety device into the NEC; but is intended to be relocated to Article 100 in future editions as its use and installation is expanded to other articles.
Panel Meeting Action: Reject
Panel Statement: The term being defined is not used in the Code.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Abstain: 1
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

18-4a Log #84 NEC-P18 **Final Action: Reject**
(406.2(B) Exception (New))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 18-8
Recommendation: Accept proposal.
Substantiation: 406.2(B) indicates receptacles shall be rated not less than 15 amperes 125 volts, or 15 amperes 250 volts. 410.30(B)(2) permits a receptacle with a rating as low as 125 percent of the luminaire full load current which may be less than 15 amperes.
Panel Meeting Action: Reject
Panel Statement: The panel concludes that this comment actually refers to 406.2(B), not 402.6(B), which is nonexistent. The panel also concludes that the reference in the substantiation to 410.30(B)(2) should have been 410.30(C)(2) as was referenced in the original Proposal 18-8. See panel action and statement on Comment 18-7.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-7 Log #100 NEC-P18 **Final Action: Reject**
(406.2(B) Exception)

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 18-8
Recommendation: Accept the proposal.
Substantiation: The panel statement that 410.30(B)(2) provides for a maximum circuit rating of 50 amperes is true only for the first sentence of that section. The second sentence permits a receptacle rating on a 15 ampere circuit to have a rating less than 15 if it is not less than 125 percent of the luminare full-load current.
Panel Meeting Action: Reject
Panel Statement: The panel accepts that 410.30(C)(2) allows receptacles with a rating lower than the circuit rating. However, the panel reiterates that the minimum rating of a receptacle shall be not less than 15 amperes.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-8 Log #1384 NEC-P18 **Final Action: Reject**
(406.3(A) (New))

Submitter: Thomas J. D'Agostino, Firefighter Products, Inc.
Comment on Proposal No: 18-10
Recommendation: Add a new paragraph after the Exception to 406.3(A) as follows:
Receptacles provided with temperature-sensor circuit interrupter (TSCI) protection shall be permitted to be installed.
Substantiation: This is a companion comment to other comments for Proposal Nos. 18-7 and 18-15. The addition of this paragraph introduces this new safety device for a permitted use in place of a standard-type receptacle and it enhances and protects the integrity of 125-volt, 15- and 20-ampere branch circuits.
This inclusion meets the very basis for requirements to be included into the NEC.
1. To prevent shock or electrocution to personnel.
2. To prevent fire to buildings and property.
This device provides this protection and is offered to any manufacturer of receptacles to further enhance their products.
On November 18, 2002, Underwriters Laboratories, Inc. (UL), completed its final report of the Preliminary Investigation of the FireFighter Products, Inc., Duplex Receptacle w/Thermal Protection (with and without Feed Thru Terminal connections), NEMA 15-5 Configuration, rated 15 amps, 125 volts. UL determined that the prototype wiring devices are eligible for listing, and accordingly, established a new product listing category, "Receptacle w/Thermal Protection" to cover the anticipated future listings of this type product.
Currently, FireFighter Products, Inc. is manufacturing the final production samples required by UL for the listing investigation of its products; and anticipates that the submittal will be made to UL by February, 2004. FireFighter Products, Inc. has also submitted their device with thermal protection to the New York City Advisory Board for their review and acceptance of their product for use in New York City.
Panel Meeting Action: Reject
Panel Statement: This comment recommends a revision to Proposal 18-10, changing it from a mandatory requirement to a permissive statement. The panel concludes that listed receptacles with thermal protection are not prohibited by the Code. Therefore, this recommendation is not required.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Abstain: 1
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

18-9 Log #2592 NEC-P18 **Final Action: Accept**
(406.3(A))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 18-10
Recommendation: This proposal should continue to be rejected.
Substantiation: The documentation submitted with the proposal does not support adoption of the requirement for an integral thermal protector in receptacles. The first page of the substantiation cites causative factors that contribute to the development of abnormal heating and subsequent fires. While it may be accurate that these conditions are contributing factors to abnormal heating, there does not appear to be any information in the substantiation clearly linking these conditions to receptacle performance. In fact, page 2393-93 of the substantiation states: "the very low failure rate indicates that electrical receptacles are highly reliable." Before a proposal of this type can be considered there must be clear identification and substantiation of the problem and an equally clear explanation of how the proposed remedy solves the problem.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Abstain: 1
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

5-242 Log #831 NEC-P05 **Final Action: Accept**
(406.3(D)(3), FPN (New))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 18-14
Recommendation: It was the action of the Technical Correlating Committee that this proposal be sent to Code-Making Panel 5 for possible action as outlined in the Code-Making Panel 18 panel statement. This action will be considered by Code-Making Panel 5 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 5 accepts the direction to consider this proposal. CMP 5 agrees with CMP18 to reject Proposal 18-14.
Number Eligible to Vote: 16
Ballot Results: Affirmative: 15 Negative: 1
Explanation of Negative:
BRENDER: The panel should have voted to accept the proposal to add the fine print note to 406.3(D)(3). Though a FPN is not enforceable, it would provide the user of the code with a valuable reference to 250.114 where there is a list of equipment that is required to be grounded. For this equipment included in 250.114, a GFCI should not be substituted for the equipment grounding conductor.
Many manufacturers of the equipment included in 250.114 include a grounding-type flexible cord for the supply to the equipment. They also include installation instructions to supply the equipment with a circuit having an equipment grounding conductor. Installing a GFCI rather than an equipment grounding conductor would be a violation of 110.3(B). In the event an appliance or equipment is to be installed or connected where an equipment ground is not present, 250.130 provides for installing an equipment grounding conductor remote from the branch circuit conductors.
Finally, GFCI devices are mechanical and solid-state in nature and are susceptible to failure. Safety is enhanced by installation of an equipment grounding conductor.

18-10 Log #1385 NEC-P18 **Final Action: Reject**
(406-3(D)(3)(d))

Submitter: Thomas J. D'Agostino, Firefighter Products, Inc.
Comment on Proposal No: 18-15
Recommendation: Add a new subparagraph (d) as follows:
(d) A non-grounding-type receptacle(s) shall be permitted to be replaced with a grounding-type receptacle(s) that is provided with temperature-sensor circuit interrupter (TSCI) protection. These receptacles shall be marked "TSCI Protected" and "No Equipment Ground". An equipment grounding conductor shall not be connected between the grounding-type receptacles.
Substantiation: This is a companion comment to Proposal Nos. 18-7 and 18-10.
The addition of this new subparagraph permits this new safety device for replacement of non-grounding-type receptacles in lieu of the other methods addressed in this section.
Panel Meeting Action: Reject
Panel Statement: No technical substantiation is given that a temperature-sensor circuit interrupter will provide an equivalent level of personnel shock hazard protection in this specific application comparable to either an equipment grounding conductor or a GFCI. Proposal 18-15 would have mandated the use of a thermally protected non-grounding type receptacle as a replacement for an existing non-grounding type receptacle. Comment 18-10 introduces a totally different concept of using a thermally protected three-wire receptacle without connecting the equipment grounding conductor.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-11 Log #2593 NEC-P18 **Final Action: Accept in Part**
(406-4(A) and (B))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 18-20
Recommendation: Revise 406.4(A) and (B) as it appears in the panel action to read as follows:
(A) Boxes That Are Set Back. Receptacles mounted in boxes or on raised box covers that are set back of the finished surface as permitted in 314.20 shall be installed so that the mounting yoke or strap of the receptacle is held rigidly at the finished surface ~~or box cover~~.
(B) Boxes That Are Flush. Receptacles mounted in boxes that are flush with the finished surface or project there from shall be installed so that the mounting yoke or strap of the receptacles is held rigidly against the box or raised box cover.
Substantiation: The intent of 406.4(A) is to insure that the receptacle is securely held in place at the finished surface when installed in a box, such as a flush device box, which may be set back from the finished surface. Although a raised box cover (also known as a mud ring or plaster ring) may be used in this type of installation, the requirement remains the same that the receptacle must be held rigidly at the finished surface. The intent of (A) is not to hold the receptacle rigidly at a box cover. The requirements for securing receptacles mounted on box covers are in 406.4(C). Adding the term "or box cover" to 406.4(A) is contradictory because a receptacle cannot be rigidly secured to a raised box cover (plaster ring) that is set back from the finished surface and at same time be held rigidly at the finished surface.
Adding the words "or on raised box covers" makes it clear that this requirement applies to both boxes and raised covers (plaster rings or mud rings) that are set back from the finished surface.

406.4(B) insures that a receptacle will be securely mounted to a box or raised cover (plaster ring or mud ring) that is flush or projects from the finished surface. It is important to maintain the words "raised box cover" to convey that the requirement applies to a plaster ring or mud ring and not to the cover mounted receptacles referred to in 406.4(C).

Panel Meeting Action: Accept in Part

Revise 406.4(A) to read as follows:

(A) Boxes That Are Set Back. Receptacles mounted in boxes that are set back of the finished surface as permitted in 314.20 shall be installed so that the mounting yoke or strap of the receptacle is held rigidly at the finished surface.

Panel Statement: The panel accepts the submitter's recommendation to delete "or box cover" from 406.4(A). The panel does not accept the addition of "or on raised box covers" in 406.4(A) and "raised" in 406.4(B).

Number Eligible to Vote: 10

Ballot Results: Affirmative: 10

18-12 Log #2595 NEC-P18 **Final Action: Accept in Principle**
(406.4(D))

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

Comment on Proposal No: 18-21

Recommendation: Revise the accepted exception to read as follows:

Exception: Listed kits or assemblies encompassing receptacles and nonmetallic wall plates where the plate cannot be installed on any other receptacle.

Substantiation: As the panel has already stated the simple marking of compatible manufacturers' name and catalog numbers is not sufficiently cautious, it must also be assumed that the consumer expects to be able to remove a wall plate and reinstall it wherever it may fit. It is, therefore, necessary that the specialized wall plate be non-interchangable.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement in Comment 18-12a.

Number Eligible to Vote: 10

Ballot Results: Affirmative: 8 Negative: 1 Abstain: 1

Explanation of Negative:

FETZER: I vote negative for the following reasons:

1. The substantiation states that the data submitted demonstrates the ability of a specific 1 mm (0.040 in.) thick faceplate to safely cover a limited number of receptacles. This is not an acceptable conclusion. The 1 mm (0.040 in.) thick faceplate must safely cover all receptacles. It is not practical, nor realistic, for a safety certifier to test every combination of receptacles and attachemnt plugs nor is it realistic for authorities having jurisdiction to enforce this type of marking limitation. In addition, new receptacles are brought to market on an ongoing basis. Ensuring that the cover plate is suitable for use with all new receptacles that will become listed after the listing of the cover plate is not possible.

2. A flush-device cover plate with this feature can conceal a cracked or broken receptacle when material is introduced over the receptacle face. This makes it difficult to identify a potentially dangerous situation.

3. In the case of investigating a cover plate of this type when submitted with a mating receptacle, it is extremely difficult if not impossible, to ensure that the same receptacle combination that was initially investigated is not separated by the user in the field and finds its way assembled onto a receptacle that has not been investigated for use with that cover plate

Explanation of Abstention:

WELLS: See my Explanation of Abstention on Comment 18-5.

18-12a Log #CC1800 NEC-P18 **Final Action: Accept in Part**
(406.4(D))

Note: The Technical Correlating Committee directs that this comment be reported as "Accept in Part". Exception No. 2 in the Comment will be reported as "Hold" because the Technical Correlating Committee is concerned that not all of the safety issues related to this Exception have been addressed by the panel.

Submitter: Code-Making Panel 18

Comment on Proposal No: 18-4

Recommendation: Revise the text in the exception and add new exception as follows:

"Exception No. 1: Listed kits or assemblies encompassing receptacles and nonmetallic faceplates that cover the receptacle face, where the plate cannot be installed on any other receptacle, shall be permitted.

Exception No. 2: Listed nonmetallic faceplates that cover the receptacle face to a maximum thickness of 1 mm (0.040 in.) shall be permitted."

Substantiation: This committee comment incorporates the committee action on Comments 18-12, 18-13, 18-14, 18-15 and 18-16.

The panel accepts in principle Comment 18-12 and incorporates the additional language in Exception No 1.

The panel concludes that the substantiation submitted for Comment 18-14 demonstrates the ability of a specific 1 mm (0.040 in.) thick faceplate to safely cover a limited number of receptacles.

Exception No. 2 is intended to provide a base point for a product standard. The 1 mm (0.040 in.) dimension was derived from the fact-finding report submitted for Comment 18-16. The panel is concerned that the requirements developed for the product standard must demonstrate the ability of these faceplates to be suitable for use with all receptacles and attachment plugs.

Panel Meeting Action: Accept

Number Eligible to Vote: 10

Ballot Results: Affirmative: 7 Negative: 2 Abstain: 1

Explanation of Negative:

FETZER: See my Explanation of Negative Vote on Comment 18-12.

ROSENBAUM: NEMA agrees with the addition of Exception No. 1 as it permits a specifically engineered and evaluated combination of products that present no hazard when used with any other products. However, NEMA strongly objects to Exception No. 2, which permits a nonmetallic cover that interposes material up to 1 mm (.040 in.) thick between the plug and any installed receptacle. Recently both UL and CSA have withdrawn listings of coverplate constructions that impose material between the plug and receptacle face. This interposed material creates a potentially unsafe condition by not allowing full insertion of the plug blades into the receptacle contacts, which may result in insufficient engagement, overheating or intermittent arcing at the plug/receptacle contact interface. Receptacles are designed to allow proper electrical contact between the plug blades and receptacle contacts when the plug face is fully seated against the receptacle face. The fact finding study evaluated the cover with only a limited sampling of receptacles, which represent a small fraction of receptacle constructions. Any valid study must take into account all constructions presently available in the installed infrastructure as well as the condition of the receptacles and future designs. This is an impractical resolution because there colud be literally thousands of differing design constructions in the installed base including worn and older devices with reduced ability to retain the plugs. The design standard for receptacles does not specify the depth of contacts or required amount of engagement with the plug blades. Consideration must be given to the minimum length of plug blade, chambers at the blade tips, as well as worn, and out of tolerance blades. Exception No. 2 does not introduce or propose any increase in the level of safety or resolve any current safety issue. Rather, it reduces the existing safety margin. The engagement of the plug blade with the receptacle contacts is critical to safe electrical connection. NEMA must protect the inclusion of Exception No. 2 because it arbitrarily reduces the integrity of this connection and could result in unsafe conditions, such as overheating, arcing and/or fire.

Explanation of Abstention:

WELLS: See my Explanation of Abstention on Comment 18-5.

18-13 Log #518 NEC-P18 **Final Action: Accept in Principle**
(406.4(D) Exception)

Submitter: Earl W. Roberts, Reptec

Comment on Proposal No: 18-21

Recommendation: Revise the Exception added by the Panel Action to read as follows:

Exception: Listed nonmetallic wall plates, listed kits or listed assemblies encompassing receptacles and nonmetallic wall plates shall be permitted.

Substantiation:

The proposed new wording of the Exception to 406.4(D) will permit the listing process, based on careful testing by the listing authority, to determine the suitability for listing of both existing and future products.

Existing Products:

There are presently wallplates which have been in use in large quantities for several years which have not only experienced NO field problems but also, as a result of their design, have contributed to safer installations.

These wallplates were initially submitted for listing, successfully passed the listing process, and were listed. By their design, the wallplates do introduce a 0.040 in. layer of insulation over the face of the receptacles. When it was called to the attention of the listing authority that the NEC in 406.4(D) states that "after installation, receptacle faces shall be flush with or project from faceplates of insulating material, etc.", the products were delisted.

Wallplates were not listed at all until a few decades ago. The wallplate thickness requirements in the 2002 NEC are the same as in the 1968 NEC. After the 1968 NEC, there were concerns about the fact that many listed attachment plugs were being sold and used with waxed paper discs covering over the often broomed-out fine strands of wire at the interface with the receptacles. The dics were held in place only by friction with the plug blades and were often missing. The loose strands often contacted metal wallplates, other terminals, and people's fingers.

As a result of these concerns, the 1971 NEC was revised to require that receptacle faces project at least 0.015 in. from metal wallplates. It was also required that receptacle faces shall be flush with or project from wallplates of insulating material.

It is ironic that the NEC and the listing standards permit the use of metal wallplates recessed only 0.015 in., that's one and one half hundredths of an inch, back from the face of the receptacle, where a long history of shock problems exists, particularly with the millions of old, non-dead-front plugs still in use, yet prohibits the use of certain types of insulated wallplates, in spite of exhaustive testing and a history of no field problems. This is just because these wallplates introduce a layer of insulation between the interface of the receptacle and the inserted plug.

Because of the present NEC wording, and the resultant lack of listing, these extra-safe wallplates are considerably less available to the public. The public is denied the following safety advantages provided by these wallplates:

1) The wallplates provide extra support to the plug line and equipment grounding blades, minimizing damage to the receptacle contacts and to the

faces of the receptacles when a plug is abruptly jerked from the receptacles at sharp angles.

How many receptacles have you seen with the section of faceplate below the grounding opening broken out? We never know the integrity of the grounding contacts until they are needed.

2) The wallplates eliminate the gap between the receptacle faces and the regular wallplates, thereby minimizing the liklihood of dust, dirt, and moisture polluting the receptacles.

3) When the wallplates are used as replacements for metal wallplates, they eliminate the many shock conditions inherent with the use of metal wallplates.

There is a basic principle at stake here:

When a new product is created, the burden of proof is on the sponsor of the new product to show that the new product is safe and that it does not cause any safety or performance problems with existing products. The listing process provides the means to judge the suitability for listing the new product. The listing authority has the opportunity to test the new product in conjunction with as many different other products as is deemed necessary.

The wording in the 2002 NEC and the Exception added by the Code-Making Panel action unnecessarily restrict the ability of the listing authority to judge the listability of a product based on extensive testing.

The point is that LISTING should be based on TESTING and not automatically prevented by NEC wording based on no testing.

The subject insulated wallplates which were initially listed and later delisted have been subjected to an extremely vigorous testing program by an independent nationally recognized testing laboratory to evaqluate the relative performance of receptacles using standard insulated wallplates and using the subject insulated wallplates.

Normally, when receptacles are being tested for listing, they are cycled automatically with a specified test plug for 250 cycles.

Tests were conducted to evaluate what effect the subject wallplates have on receptacles which are approaching their end of life from normal usage.

Six each of the four most commonly used residential grade receptacle brands were conditioned, not to 250 cycles, but to 15,000 cycles, both with standard insulated wallplates and with the subject wallplates. New test plugs were used at regular intervals to minimize the effects of plug blade wear on the test results.

Temperature rise and plug retention tests were conducted in conformity with the UL 498 Standard.

There were NO significant differences between the two types of wallplate installations.

One of the receptacle types, which had lower test values, was continued on test to 25,000 cycles. After the test, the temperature rise values on both installations were less than 5 degrees C, as compared with a 30 degrees C rise allowed in the standard. Plug retention was essentially equivalent, and well within the UL requirements.

These same receptacles were tested to 70,000 cycles. That's like plugging and unplugging a receptacle once a day for almost 200 years!

Both installations had lower retention values than the minimum 3 pound pull-out force allowed in the UL Standard - 1.27 pounds for the standard wallplate and 1.56 pounds for the subject wallplate.

In order to determine what effects abusive angular withdrawal of a plug had on both wallplate types, a test from the Hospital Grade listing process was conducted. The test indicated that the line blades of plugs bend upon removal, and thus did not significantly affect the tension of the line contacts in the receptacles of both test installations.

However, the equipment grounding blades of plugs are of more rigid construction, being either U-shaped or round. After the test, the grounding contacts of the receptacle with the standard wallplate had lost their tension and provided no ground path. The grounding contacts of the receptacle with the subject wallplate still retained tension and provided a grounding path.

Future Products:

It is anticipated that new products, some of which are already in the development stage, will add considerably to safety. These products are particularly applicable to existing, older homes, where the electrical fire and shock problems can be more prevalent, as well as new homes.

With the proposed revision to the Exception, the new products will have an opportunity to be tested and judged on their merits as a condition for listing.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement in Comment 18-12a.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 7 Negative: 2 Abstain: 1
Explanation of Negative:
FETZER: See my Explanation of Negative Vote on Comment 18-12.
ROSENBAUM: See my explanation of negative vote on Comment 18-12a.
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

18-14 Log #705 NEC-P18 **Final Action: Accept in Principle**
(406.4(D) Exception)

Submitter: Charles B. Schram Scottsdale, AZ
Comment on Proposal No: 18-21
Recommendation: Revise the exception in the panel action as follows:

Exception: Listed kits or listed assemblies encompassing receptacles and nonmetallic wall plates, and nonmetallic wall plates that have been tested and listed for the purpose, shall be permitted.

Substantiation: The exception added by the panel action is overly restrictive. It requires that a new receptacle be provided, and as such, it does not meet the apparent intent of the submitter. Also, it does not allow designs of receptacle wall plates that provide greater safety for the user than wall plates now permitted by the code. The lack of a dimensional standard controlling the depth of receptacle contacts behind the face of the receptacle is to allow receptacle designs that meet performance requirements without undue restrictions on dimensions. The panel should also allow for receptacle wall plates that meet accepted performance requirements.

Listed nonmetallic wall plates are inherently safer than metal wall plates when used with the many millions of attachment plugs that depend on a removable, and often lost, insulating barrier to prevent stray strands of wire from contacting a metal wall plate. The 0.015 inch required setback of a metal wall plate does not provide anywhere near the degree of safety provided by a listed nonmetalic wall plate.

A thin layer of insulating material over the face of the receptacle provides even more safety, since it helps support the blades of the attachment plug, reducing the potential for damage to the face of the receptacle and the receptacle contacts. The panel should provide a means to increase safety through the development of innovative wall plate designs, tested and listed for the purpose, rather than simply insisting that new receptacles be installed with such wall plates.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement in Comment 18-12a.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 7 Negative: 2 Abstain: 1
Explanation of Negative:
FETZER: See my Explanation of Negative Vote on Comment 18-12.
ROSENBAUM: See my explanation of negative vote on Comment 18-12a.
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

18-15 Log #741 NEC-P18 **Final Action: Accept in Principle**
(406.4(D) Exception)

Submitter: Joel A. Rencsok, Three Phase Engineering
Comment on Proposal No: 18-21
Recommendation: Revise the Exception added by the panel to read as follows:

Exception: Listed nonmetallic wall plates, listed kits or listed assemblies encompassing receptacles shall be permitted.

Substantiation: This will clarify the wording and make the code more user friendly. The rewording does not change the intent, but requires non metallic wall plates to be listed which the original exception would not. I believe the panel's intent was to require listing on all wall plates.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement in Comment 18-12a.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 7 Negative: 2 Abstain: 1
Explanation of Negative:
FETZER: See my Explanation of Negative Vote on Comment 18-12.
ROSENBAUM: See my explanation of negative vote on Comment 18-12a.
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

18-16 Log #3484 NEC-P18 **Final Action: Accept in Principle**
(406.4(D) Exception)

Submitter: John B. Kinnard, Taymac Corporation
Comment on Proposal No: 18-21
Recommendation: Revise the exception as listed in the panel meeting action to read:

Exception: Nonmetallic wall plates and kits or assemblies incorporating receptacles and nonmetallic wall plates, which have been tested and listed for the purpose, shall be permissible.

Substantiation: Taymac Corporation has been manufacturing an innovative line of wall plates for many years. The principal behind the Masque wall plates is simple; a thin (.040 in.) layer of insulating material covers the receptacle face, allowing the consumer to update decor without replacing the receptacle. This thin layer contains openings that allow attachment plug line and ground blades to pass through and engage the receptacle contacts. The Masque line of wall plates is currently sold throughout the United States in retail stores, home centers, and electrical distributors. With this vast distribution, our wall plates can be found in tens of thousands of facilities including, homes, apartment and office buildings and billion dollar resorts. In addition, a wide range of people ranging from homemakers to skilled electricians has installed these wall plates. In all this time and with millions of products in the field, we have not had a single customer complaint in any regard.

Fact Finding Study: We have set out to prove that our product is safe by testing it with artificially aged receptacles that mimc used receptacles in the real world. To insure the validity of the data, an independent nationally accredited testing laboratory has tested our product over a six-month period. The laboratory gathered test data with our Masque wall plate and a standard wall plate at several interim levels of aging to see ow our product performed over a receptacle's lifetime. The Fact Finding Study is based on sections 112, 113, 114.2, SD23.1 and SD23.3 in the standard UL 498, which define how receptacles are tested in respective order for temperature, retention of plug blades, resistance to arcing, and ground resistance. Results from testing with both wall plates exhibited less than a 5 degree Celsius change in receptacle temperature over ambient conditions. The Standard UL 498 allows 30 ^{0}C. In some cases the temperatures were reduced when using the Masque wall plate by several degrees Celsius. The Masque wall plate provided several pounds greater peak pullout force than the standard wall plate. Both wall plates also passed the plug retention test maintaining attachment plug position under a 3lb load as required by the standard. The severity of the mechanical conditioning was incredible, the test lab mechanically cycled (plug & unplug) six receptacles from each of four common manufacturers in interim steps, in some cases up to 70,000 cycles to reach their end of life. For an individual to reach 70,000 cycles they would need to plug and unplug an attachment plug once every day for 191 years!

all of this data will be included in a formal Fact Finding Report.

Internally at Taymac, we have conducted a test to supplement the Fact Finding Report by simulating what happens when an end user rapidly removes an attachment plug at extreme angles. This test was base on section SD21.3 of the standard UL 498, a test meant for hospital grade receptacles. When assembled with a standard wall plate and tested in the above manner, the plastic bridge directly below the ground contact opening of the receptacle broke away and a complete loss of ground contact tension was measured. One could conclude that with a complete loss of ground contact tension, the ground path is lost. After repeated tests in the above manner, half of the receptacle face broke away exposing the live contacts. When this same test was repeated using our Masque wall plate, the receptacle was not damaged and the ground contact tension was not diminished.

Consumer Safety and Product Innovation: In my opinion, the intent of the NEC and all safety related standards are to protect the public from harm. Currently, the way section 406.4(C)(D) of the code is written, safety innovations such as the Masque wall plate and others are prevented by default from entering the marketplace with the necessary listing. A manufacturer should be allowed to prove, through testing, that this product is safe for the public, without unduly restrictive code wording.

Summary: The Fact Finding Report provides indisputable factual evidence that our product is safe. Our product not only is as safe as a standard wall plate, but also is safer in many conditions. By design, our product covers the face of the receptacle with a thin layer of insulating material; this design has been proven through testing to be a safety benefit. This design provides extra rigidity and support to the receptacle line and ground contacts during extreme plug removals, and improves plug blade retention by older receptacles, minimizing the potential exposure to live attachment plug blades. Taymac will provide a complete copy of the Fact Finding Report, which includes the design of experiments, the receptacles tested, the raw data and photos of equipment. Each panel member will receive this package to review before the December panel meeting.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement in Comment 18-12a.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 7 Negative: 2 Abstain: 1
Explanation of Negative:
FETZER: See my Explanation of Negative Vote on Comment 18-12.
ROSENBAUM: See my explanation of negative vote on Comment 18-12a.
Explanation of Abstention:
WELLS: See my Explanation of Abstention on Comment 18-5.

18-17 Log #3183 NEC-P18 **Final Action: Reject**
(406.4(E))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 18-24
Recommendation: The Panel should accept this proposal.
Substantiation: We agree with the submitter that this requirement should be expanded to cover all installations. The type of installation is not significant for the purposes of applying this rule. The risks and potential hazards are equal. The rule should follow as such. This is another case where the "technical substantiation" exists just in a practical application and understanding that the specific location does not impact the potential risks associated with the installation, in this case, mounting the receptacle in a face-up position.

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 did not accept the deletion of "in dwelling units" in 406.4(E). The substantiation did not support expanding this requirement to other than dwelling units. Acceptable substantiation could consist of anecdotal incident reports, accident reports, photographs of hazardous installations, diagrams, or any other supporting documentation.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 8 Negative: 2
Explanation of Negative:
COSTELLO: I vote negative on the panel action.

I do not support the panel action to Reject the comment. The requirement should be expanded to cover all installations. The hazards that can develop from the installation are not limited to installations in dwelling units. A receptacle that is installed in the face-up postion in a countertop or similar surface such as those commonly found in medical, educational or other non-dwelling units present the same risk of an accidental spill or cleaning product being spilled onto the receptacle face. Other factors that contribute to damage of the receptacle are items that are dropped on the receptacles, metal filings and dusts from grinding wheels also introduce hazards by being installed in the face-up postion.

WELLS: Yes, it would be nice to have more data. However, it is unlikely that incidents involving material falling into a receptacle will result in an electrocution and, thus, it is very unlikely to hit any incident data report. The most likely incident is a flash burn. The type of locations that would be covered by expansion of this requirement would be a laboratory (science and home economics) in educational institutions and industry as well as assembly areas in industrial establishments. In fact, the material that could enter the receptacle in such locations could be far more hazardous than is found in a residence. There are numerous methods of providing conveniently located receptacles without mounting them face-up in work space countertops.

18-18 Log #1854 NEC-P18 **Final Action: Accept**
(406.4(G) (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-25
Recommendation: Continue to reject the proposal.
Substantiation: There are uncounted millions of cord sets now in use and in routine production with the grounding member on the same side as the cord. Requiring all grounding receptacles to be installed from this point forward would force these cords to hang with their cords bent double while in use. This would routinely tend to expose more metal parts at the receptacle face than covered in the proposal substantiation because reversed cords tend to dislodge the cord cap. The issue must remain as the panel has described it: installation specific.
Panel Meeting Action: Accept
Panel Statement: See the panel statement for Comment 18-3.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-19 Log #2597 NEC-P18 **Final Action: Accept**
(406.6(B) (New))

Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 18-29
Recommendation: Reconsider the proposal and instead of deleting the second sentence, revise the second sentence so that 406.6(B) reads as follows:

(B) Attachment plugs shall be installed so that their prongs, blades, or pins are not energized unless inserted into an energized receptacle. No receptacle shall be installed so as to require <u>the insertion of</u> an energized attachment plug as its source of supply.

Substantiation: The original intention was not to prohibit extension cords but to prevent the use of plugs with live blades being used to energize receptacles and receptacle circuits by inserting the "live" plug into one of the receptacle outlets. Due to serious safety hazard, this presents it is important to keep this specific prohibition in the code and simply clarify the intent so as to not impact extension cords.
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-20 Log #383 NEC-P18 **Final Action: Reject**
(406.6(C) (New))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 18-31
Recommendation: Accept proposal.
Substantiation: Whether or not field applications are problematic is irrelevant. The two sections clearly conflict.
Panel Meeting Action: Reject
Panel Statement: The submitter did not provide substantiation explaining the alleged conflict between the two sections. The proposal itself was not justified on the basis of a conflict between sections.

Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-21 Log #392 NEC-P18 **Final Action: Reject**
(406.6(C) (New))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 11-30
Recommendation: Revise:
A flanged surface inlet shall be installed so that prongs, blades, or pins are not energized unless ~~an energized cord connector~~ inserted into ~~it~~ an energized cord connector body.
Substantiation: Panel wording is in error; a cord cap cannot be inserted into a flanged surface inlet.
Panel Meeting Action: Reject
Panel Statement: The panel action wording to Proposal 18-30 is correct. However, there is an error in the wording of the panel statement where the term "cord cap" was used instead of "cord connector." A cord connector can be inserted into a flanged surface inlet.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-22 Log #1855 NEC-P18 **Final Action: Accept in Part**
(406.8(B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-33
Recommendation: The proposal should be accepted in principle and in part. Accept the principle of treating wet locations in a consistent manner. Reject the generic allowance for use while attended, as follows:
(1) 15- and 20-Ampere Receptacles in Wet Locations. 15- and 20-ampere, 125- and 250-volt receptacles installed in wet locations not routinely subject to pressurized water spray shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted.
Make no change in (2).
Substantiation: The panel statement is correct, however, this code provision has never taken into account receptacles at outdoor car washing facilities and other areas that are (1) outdoors, and (2) routinely subject to a hose stream. This comment eliminates the obvious conflict between the panel statement and the literal wording of this section of the NEC.
Panel Meeting Action: Accept in Part
The panel accepts the deletion of the word "outdoor" and does not accept the addition of the words "not routinely subject to pressurized water spray."
Panel Statement: See the panel action on Comment 18-23. The panel accepts the portion of the proposal to extend the requirement to indoor wet locations. The panel does not accept that portion of the proposal excluding indoor locations routinely subject to pressure water spray, because the panel believes use of the word routinely is vague and unenforceable.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-23 Log #1966 NEC-P18 **Final Action: Accept in Principle**
(406.8(B)(1))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 18-35
Recommendation: The Panel should accept this proposal.
Substantiation: We agree with the substantiation provided by the submitter of the proposal. Receptacles installed in indoor locations in some installations are frequently exposed to products of moisture and need to be provided with protection as well. If the hazard of a wet condition could occur, the location, outdoors or indoors is not relevant. Adopting this proposal will be a proactive step for electrical safety. This Comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept in Principle
Revise the text in the proposal to read as follows:
(B) Wet Locations.
(1) 15- and 20-Ampere ~~Outdoor~~ Receptacles in a Wet Location. 15- and 20-ampere, 125- and 250-volt receptacles installed ~~outdoors or~~
in a wet location shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted.
Panel Statement: The panel revised the text to reflect the intent of Comment 18-23.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-24 Log #787 NEC-P18 **Final Action: Reject**
(406.8(C))

Submitter: Michael J. Johnston Plano, TX
Comment on Proposal No: 18-41
Recommendation: Continue to accept this proposal and revise as follows:
(C) Bathtub and Shower Area ~~Space~~. A receptacle shall not be installed within a bathtub or shower area ~~space~~.
FPN: See 410.4(D) for ~~tub or shower area definition~~ the dimensions of the tub or shower zone.
Substantiation: The word area is much needed clarification in this section for consistency. Section 410.4(D) is not a definition. It is more appropriate to use dimensions and use the word "zone" as this word is used in the rule twice. This is only an editorial adjustment to the proposed new FPN. I agree with the concept of this proposal.
Panel Meeting Action: Reject
Panel Statement: The panel recognizes that there is inconsistency between the wording used in 406.8(C) and 410.4(D). This inconsistency is intentional to differentiate the requirements for receptacles from the requirements for luminaires.
The panel does not agree that receptacles need to be installed 3 feet away from the outer edge of a tub or shower. In many instances, especially in the smaller apartment sized bathrooms, it would be impossible to install a receptacle beyond 3 feet from the edge of the tub. It should be noted that receptacles installed in bathrooms are required to be GFCI protected whereas luminaires are not.
The panel agrees that receptacles shall not be installed within the footprint of a tub or shower from floor to ceiling.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10

18-25 Log #526 NEC-P18 **Final Action: Accept**
(406.9(B)(4) & Figure 406-9(B)(4))

Note: The Technical Correlating Committee directs that the caption for the Figure be revised to read: "FPN: This is one example of a symbol used to identify the termination point for an equipment grounding conductor."
This action is to resolve the issue raised in the Comments on Vote.
In addition, the Technical Correlating Committee directs that item (4) be revised to read: "If the terminal for the equipment grounding conductor,..." to be consistent with the final sentence and since the term appears to have been omitted without substantiation.
Submitter: Gregory J. Steinman, Thomas & Betts Corporation
Comment on Proposal No: 18-48
Recommendation: This comment is to encourage the panel to reconsider its action on Proposal 18-48. Renumber existing "Figure 406.9(B)(4)" as "FPN Figure 406.9(B)(4)" and revise the text in 406.9(B)(4) as follows:
(4) If the terminal for the grounding conductor is not visible, the conductor entrance hole shall be marked with the word green or ground, the letters G or GR, ~~or the~~ a grounding symbol ~~shown in Figure 406.9(B)(4)~~, or otherwise identified by a distinctive green color. If the terminal for the equipment grounding conductor is readily removable, the area adjacent to the terminal shall be similarly marked.
FPN: Insert Figure 406.9(B)(4) here.
Substantiation: This comment was developed by a Task Group as directed by the NEC Technical Correlating Committee. Members of the Task Group included Gregory Steinman (NEMA-CMP-5), Michael Johnston (IAEI-CMP-5), Walter Skuggevig (UL-CMP-5), Fred Carpenter (NEMA-CMP-18), Michael O'Boyle (ALA-CMP-18), and Jim Pierce (ITS-CMP-18).
406.9(B)(4) provides various methods of identification terminals for grounding conductors or the hole in devices or equipment intended for grounding conductor connections. Figure 406.9(B)(4) is referred to from the text as another alternative method of grounding conductor terminal identification. It is recognized that there is a variety of symbols used for grounding conductor terminations by electrical product standards and other industry standards. To avoid possible confusion created (as to specific meanings), and to avoid developing a list of grounding symbols in the Code by inserting additional symbol(s) to Figure 406.9(B)(4), it is recommended that Figure 406.9(B)(4) be renumbered as FPN Figure 406.9(B)(4). By making the figure a Fine Print Note, it will serve as information for users and allows manufacturers to apply identification to grounding conductor terminals as specified in the rule and consistent with those identification means provided in product and industry standards without limiting the marking means to just a grounding symbol. It is appropriate to change the current figure to a Fine Print Note Figure as it serves an informational purpose and is among various permitted and recognized grounding terminal identification means. This is also consistent with current provisions of 90.5(C).
Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 10
Comment on Affirmative:
FETZER: UL agrees with the panel action to Accept this comment developed by the Task Group, but we are concerned that the wording "grounding symbol" for the caption of the Fine Print Note might not make it sufficiently clear that the symbol shown in the FPN Figure is not the only acceptable grounding symbol. The text of 250.126 accepted by Panel 5 states that "a grounding symbol"

is one of the acceptable ways of identifying the equipment grounding terminal and the caption of the FPN Figure simply says "grounding symbol". This can be interpreted to imply that the grounding symbol shown is the only acceptable grounding symbol. We suggest that the caption of the FPN Figure should be expanded to say "FPN: One example of a symbol used to identify the termination point for the equipment grounding conductor."

ARTICLE 408 — SWITCHBOARDS AND PANELBOARDS

9-125 Log #71 NEC-P09 **Final Action: Reject**
(408.3(C))

Submitter: Michael V. Glenn, Longview Fibre Co.
Comment on Proposal No: 9-103
Recommendation: Reject this proposal.
Substantiation: The proposal to change equipment grounding conductor to equipment bonding conductor was rejected.
Panel Meeting Action: Reject
Panel Statement: CMP 9 continues to concur in the rejection of the global change from "equipment grounding" to "equipment bonding"; however, this conductor, which does not leave the enclosure, is better described as a bonding conductor.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-126 Log #128 NEC-P09 **Final Action: Accept in Principle in Part**
(408.4)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 9-104
Recommendation: Instead of "~~The marking shall be unique, so as to enable users to differentiate between disconnecting means serving similar loads quickly and unmistakably~~". accomplish this purpose by saying in the second sentence, "The marking shall identify the specific nature and location(s) of the load(s), and shall be of sufficient durability...".
Also add, "The marking shall be permitted to be located up to 15 mm (six in.) away."
Substantiation: This removes the explanatory material from the original proposal. It also says what information is needed, which may be more useful than just saying the label needs to be "specific" or "unique." It adds relief for installers whose designs result in either of two circumstances. One indicates that where circuiting is poorly rationalized, so either lengthy descriptions are necessary or posting actual diagrams will make it faster to locate disconnects, installers need not try to squeeze them right on the equipment, say by scribbling on panel cover directories. (Lifted from proposal 19-129).
Panel Meeting Action: Accept in Principle in Part
Accept the concept of the indentification as indicated in the comment. Reject the marking distance as indicated in the comment.
Panel Statement: The revised text of 408.4 is shown in the panel action on Comment 9-129. There is no technical substantiation to arrive at a method of determining the distance as indicated in the comment.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-127 Log #924 NEC-P09 **Final Action: Accept in Principle**
(408.4)

Submitter: Dorothy Kellogg, American Chemistry Council
Comment on Proposal No: 9-104
Recommendation: The proposal should have been accepted in principle in part. Proposed wording: Add at end:
"The identification shall be unique for the premises so as to enable users to differentiate between disconnecting means serving similar loads."
Substantiation: Safety will be improved when panel directories are marked in such a manner that there is no confusion as to what is being controlled by each circuit. The word "unique" used without any modification is too broad in application. The words "quickly and unmistakably" are not easily enforced.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-129.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-128 Log #1911 NEC-P09 **Final Action: Accept in Principle**
(408.4)

Submitter: Donald R. Offerdahl, North Dakota State Electrical Board
Comment on Proposal No: 9-104
Recommendation: This proposal should be "Accepted in Principle". The submitter's concern about properly marking the circuit directory could be improved by adding the words to the sentence to read as follows:
"All circuits and circuit modifications shall be legibly identified as to its clear, evident and specific purpose or use on a circuit directory."
Substantiation: These additional words will emphasize the importance of circuit directory for the safe operation of an electrical system in addition to the complaints from the owners, users and electricians that they don't know which breaker to turn off, when it is needed.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-129.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-129 Log #2032 NEC-P09 **Final Action: Accept in Principle**
(408.4)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-104
Recommendation: The proposal should be accepted in principle. Revise the additional sentence to read as follows: "The circuit directory information shall contain sufficient detail to allow each circuit to be distinguished from all others."
Substantiation: The submitter has considerable sympathy for this proposal, having gone through a difficult history of getting installers in his former jurisdiction to first, even provide circuit directories, and then, having those directories convey useful information. He has seen far too many panels with directories showing, for example, ten 15A circuits saying "lights and plugs", six circuits labeled "heat" and two or three marked "kitchen outlets".
The panel statement is partially correct, and this comment does not use the phrase "quickly and unmistakably" Although the Code does allow the enforcement community to insist on what the proposal and this comment requests, express language would produce more consistent enforcement. When the submitter began enforcing useful circuit directories all he had to work with was 110.22. The 1990 NEC brought the express circuit directory requirement to then 384.13, and compliance improved. Relocation of the requirement to 408.4 in the 2002 NEC as a stand-alone requirement improved visibility and compliance even more. This comment will result in a further improvement in compliance, with a commensurate improvement in safety.
Panel Meeting Action: Accept in Principle
Revise 408.4 as follows:
Circuit Directory or Circuit Identification. Every circuit and circuit modification shall be legibly identified as to its clear, evident, and specific purpose or use. The identification shall include sufficient detail to allow each circuit to be distinguished from all others. The identification shall be included in a circuit directory that is located on the face or inside of the panel door in the case of a panelboard, and located at each switch on a switchboard.
Panel Statement: The new revision meets the intent of the submitter and incorporates information from Comment 9-128.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
RUPP: The change made by the panel in the last sentence to require switchboard marking to be at each switch rather than accept a circuit directory is a major change without technical justification or public review. This revision should be rejected.**Comment on Affirmative:**
HARTWELL: NEMA and UL should urgently review UL 67 in order to address this change in an orderly way. I doubt there is a single panelboard now in production with a circuit directory capable of showing this level of detail, unless the purpose were written in 4-pt type. That, of course, would defeat the safety objective since one would likely need a magnifying glass to read it. I personally gave up on such directories long ago, and have templates for various panel brands in my computer. The current directory designs actively frustrate the intentions of this new wording.

9-130 Log #2177 NEC-P09 **Final Action: Accept in Principle**
(408.4)

Submitter: Danny Liggett Richmond, TX
Comment on Proposal No: 9-104
Recommendation: This proposal should have been accepted in principle.
Revise text to read as follows:
"The identifications shall be unique, so as to enable users to differentiate between disconnecting means serving similar loads ~~quickly and unmistakable~~."
Substantiation: I just got transferred and in the new location we bought a new house. Two-thirds of the circuits in the panel are marked "lights and receptacles." I had no idea which room was which. This is a problem. The best way to help someone who is "froze" to a circuit is to turn the power off. How can you do that if you can't figure out which circuit is which? You might say "kill the main switch." Not all have main switches. The current wording provides a loop hole so installers can use generic information. The information needs to be specific. Both NFPA 70E and OSHA require up to date information for the purpose of lockout/tagout. The way my panelboard was marked does not meet the intent of what is required by OSHA or 70E. It is imperative that the NEC have requirements that will help to alleviate this situation. By adding the wording as revised above aligns the NEC with other regulatory requirements.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-129.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

12-4 Log #607 NEC-P12 **Final Action: Accept**
(408.15)

Note: The Technical Correlating Committee directs the words "by a qualified testing laboratory" be deleted from the panel action text since the words are redundant with the term "listed" as defined in Article 100.
Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-110
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 12 for action in Article 645. This action will be considered by Code-Making Panel 12 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Add a new 645.17 to read as follows:
"Power Distribution Units. Power distribution units that are used for information technology equipment shall be permitted to have multiple panelboards within a single cabinet, provided that each panelboard has no more than 42 overcurrent devices and the power distribution unit is utilization equipment listed for information technology application by a qualified testing laboratory."
Panel Statement: The panel accepts the direction of the Technical Correlating Committee to review Proposal 9-110 as it relates to Article 645.
Number Eligible to Vote: 12
Ballot Results: Affirmative: 12
Comment on Affirmative:
BURKE: The preferred wording is as follows:
645.17 Power Distribution Units. Power distribution units that are used for information technology equipment shall be permitted to have multiple panelboards within a single ~~cabinet~~ enclosure, provided that each panelboard has no more than 42 overcurrent devices, and the power distribution unit is ~~utilization equipment~~ listed ~~for~~ information technology equipment ~~application by a qualified testing laboratory.~~
Rationale:
- Per the Article 100 definitions, "enclosure" is the proper term to describe what the panelboards are housed in an ITE context, not "cabinet."
- "Listed" is a defined term in Article 100 that already incorporates the "qualified testing laboratory" consideration.
- UL Lists power distribution units for use in Information Technology Equipment (Computer) Rooms as Information Technology Equipment, and the revised wording is consistent with 645.2(3).
JOHNSON: I wish to support the wording as recommended by Mr. Burke.

13-4 Log #608 NEC-P13 **Final Action: Accept**
(408.16(F) Exception (New))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-115
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 13 for action in 690. This action will be considered by Code-Making Panel 13 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Accept
Panel Statement: The panel is not absolutely sure of the intent of the proposal. The panel presumes that this proposal is a desire to exempt solar photovoltaic systems from the requirement of 690.64(B)(5) that backfed equipment be identified for such use or operation that includes an additional fastener as required in 408.16(F). It is unclear from the substantiation what is actually intended with this exemption. The panel believes that any modifications to the requirement of 408.16(F) for Solar Photovoltaic Systems should be located in Article 690. If the panel's presumption is accurate, the panel believes that panel action on Proposal 13-54 would meet the intent of the submitter of Proposal 9-115 by allowing unclamped individual breakers under certain circumstances and conditions as limited in the panel action on Comment 13-38.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 13 Abstain: 1
Explanation of Abstention:
HATTAWAY: I am not sure what the intention of this comment is and since I was not at the meeting, I did not hear the panel's discussions concerning this comment. Therefore, I wish to Abstain.

19-4 Log #609 NEC-P19 **Final Action: Reject**
(408.16(G))

Submitter: Technical Correlating Committee on National Electrical Code®
Comment on Proposal No: 9-116
Recommendation: It was the action of the Technical Correlating Committee that this Proposal be referred to Code-Making Panel 19 for action in Article 550. This action will be considered by Code-Making Panel 19 as a public comment.
Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.
Panel Meeting Action: Reject
Panel Statement: Sections 250.142(B) and 550.16 prohibit using the grounded (neutral) conductor as an equipment grounding conductor on the load side of the service.
Number Eligible to Vote: 8
Ballot Results: Affirmative: 8

9-131 Log #127 NEC-P09 **Final Action: Accept in Principle**
(408.18)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 9-119
Recommendation: Accept (for any location you wish) with one tweak: delete "~~adequately~~" and append "using approved means."
Substantiation: "Adequate" is undefinable. The Authority Having Jurisdiction decides what's adequate by "approving," which is standard, legit Code lingo.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 9-132.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

9-132 Log #2033 NEC-P09 **Final Action: Accept in Principle**
(408.18)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 9-119
Recommendation: The proposal should be accepted in principle. Insert the following new section in Part I:
408.7 Unused Openings. Unused openings for circuit breakers and switches shall be closed using listed closures, or other approved means that provide protection substantially equivalent to the wall of the enclosure.
Substantiation: This issue is intimately connected with the requirements for panelboard dead fronts and switchboard enclosures. It does not really belong with the generic requirements in 110.12(A). This comment avoids the discouraged term "adequately" and locates the material in Part I where it will apply to both panelboards and switchboards.
Panel Meeting Action: Accept in Principle
Change the word "listed" to "identified" in the recommendation.
Panel Statement: This change meets the intent of the submitter, but recognizes that all closures are not listed.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
RUPP: NEMA agrees with the change in terms from "listed" to "identified", but this requirement should remain the responsibility of Panel 1 as was indicated at the ROP meeting. This is an all-encompassing requirement that should be applicable to all equipment and not be restricted to panelboards and switchboards. Many other types of equipment such as motor control centers, industrial control panel, etc. have the possibilities of similar openings in the equipment and should have the same closure requirements.
Comment on Affirmative:
HARTWELL: This raises a turf issue. The Technical Correlating Committee will probably need to correlate the action on this comment with the submitter's companion comment on Proposal 1-160.

11-3a Log #CC1101 NEC-P11 **Final Action: Accept**
(Article 409)

Note: The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee Accepts that panel action with the following modification.
Revise 409.1 to read: "This article covers industrial control panels intended for general use and operating at 600 volts or less."
The Fine Print Note is to remain as in the panel recommendation.
This revision is to use language consistent with other code articles.
Submitter: Code-Making Panel 11
Comment on Proposal No: 11-5
Recommendation: Add new Article 409 to 2005 NEC.

Article 409 – Industrial Control Panels
I. General
409.1 Scope. This article covers industrial control panels intended for general use and operating from a voltage of 600 volts or less.
FPN: UL 508A is a safety standard for Industrial Control Panels.
409.2 Definitions.
Industrial Control Panel. An assembly of a systematic and standard arrangement of two or more components such as motor controllers, overload relays, fused disconnect switches, and circuit breakers and related control devices such as pushbutton stations, selector switches, timers, switches, control relays and the like with associated wiring, terminal blocks, pilot lights and similar components. The industrial control panel does not include the controlled equipment.

409.3 Other Articles. In addition to the requirements of Article 409, Industrial Control Panels that contain branch circuits for specific loads, components, or are for control of specific types of equipment addressed in other articles of this Code shall be constructed and installed in accordance with the applicable requirements from the specific articles in Table 409.3.

II. Installation

409.20 Conductor – Minimum Size and Ampacity. The size of the industrial control panel supply conductor shall have an ampacity not less than 125 percent of the full-load current rating of all resistance heating loads plus 125 percent of the full-load current rating of the highest rated motor plus the sum of the full-load current ratings of all other connected motors and apparatus based on their duty cycle that may be in operation at the same time.

409.21 Overcurrent Protection.

(A) General. Industrial Control Panels shall be provided with overcurrent protection in accordance with Parts I, II, and IX of Article 240. ~~Overcurrent protection for the control panel shall be provided by either fuses or circuit breakers.~~

(B) Location. This protection shall be provided by either,

(1) an overcurrent protective device located ahead of the industrial control panel or

(2) a single main overcurrent protective device located within the industrial control panel. Where overcurrent protection is provided ~~for the control panel~~ as part of the industrial control panel, ~~overcurrent protection shall consist of a single circuit breaker or set of fuses and~~ the supply conductors shall be considered either as feeders or taps as covered by 240.21.

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

Exception: Where one or more instantaneous trip circuit breakers or motor short-circuit protectors are used for motor branch-circuit short-circuit and ground-fault protection as permitted by 430.52(C), the procedure specified above for determining the maximum rating of the protective device for the circuit supplying the industrial control panel shall apply with the following provision: For the purpose of the calculation, each instantaneous trip circuit breaker or motor short-circuit protector shall be assumed to have a rating not exceeding the maximum percentage of motor full-load current permitted by Table 430.52 for the type of control panel supply circuit protective device employed.

Where no branch-circuit short-circuit and ground-fault protective device is provided with the industrial control panel for motor or combination of motor and non-motor loads, the rating or setting of the overcurrent protective device shall be based on 430.52 and 430.53, as applicable.

409.30 Disconnecting Means. Disconnecting means that supply motor loads shall comply with Part IX of Article 430.

409.60 Grounding. Multi-section industrial control panels shall be bonded together with an equipment grounding conductor or an equivalent grounding bus sized in accordance with Table 250.122. Equipment grounding conductors shall terminate on this grounding bus or to a grounding termination point provided in a single-section industrial control panel.

I. Construction Specifications

409.100 Enclosures. ~~Enclosures shall be made of moisture-resistant, noncombustible material.~~ Table 430.91 shall be used as the basis for selecting industrial control panel enclosures for use in specific locations other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, corrosion, or contamination that may occur within the enclosure or enter via the conduit or unsealed openings. ~~These internal conditions shall require special consideration by the installer and user. An enclosure type number shall be marked on the industrial control panel enclosure.~~

409.102 Busbars and Conductors. Industrial Control panels utilizing busbars shall comply with 409.102(A) and (B).

(A) Support and Arrangement. Busbars shall be protected from physical damage and be held firmly in place.

(B) Phase Arrangement. The phase arrangement on 3-phase horizontal common power and vertical buses shall be A, B, C from front to back, top to bottom, or left to right, as viewed from the front of the ~~motor control center~~ industrial control panel. The B phase shall be that phase having the higher voltage to ground on 3-phase, 4-wire, delta-connected systems. Other busbar arrangements shall be permitted for additions to existing installations and shall be marked.

409.104 Wiring Space in Industrial Control Panels.

(A) General. Industrial Control panel enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless adequate space for this purpose is provided. The conductors shall not fill the wiring space at any cross section to more than 40 percent of the cross-sectional area of the space, and the conductors, splices, and taps shall not fill the wiring space at any cross section to more than 75 percent of the cross-sectional area of that space.

(B) Wire Bending Space. Wire bending space for the main supply terminals shall be in accordance with the requirements in 312.6. Wire bending space for other terminals shall be in accordance with the requirements in 430.10(B). The gutter space shall comply with 312.8.

409.106 Spacings. Spacings between ~~terminals and other~~ live bare metal parts in feeder circuits shall not be less than specified in Table 430.97.

409.108 Service-Entrance Equipment. Where used as service equipment, each industrial control panel shall be of ~~provided with a single main disconnecting means to disconnect all ungrounded service conductors. The disconnecting means shall be of~~ the type that is suitable for use as service equipment. ~~applications.~~

Where a grounded conductor is provided, the industrial control panel shall be provided with a main bonding jumper, sized in accordance with 250.28(D), for connecting the grounded conductor, on its supply side, to the industrial control panel equipment ground bus or terminal.

409.110 Marking. An industrial control panel shall be marked with the following information that is plainly visible after installation:

1) Manufacturers name, trademark or other descriptive marking by which the organization responsible for the product can be identified

2) Supply voltage, phase, frequency, and full-load current

3) Short-circuit current rating of the industrial control panel based on one of the following:

a. short circuit current rating of a listed and labeled assembly

b. short circuit current rating established utilizing an approved method

FPN: UL508A-2001 Supplement SB is an example of an approved method

4) If the industrial control panel is intended as service equipment it shall be marked to identify it as being suitable for use as service equipment.

5) Electrical wiring diagram or the number of the index to the electrical drawings showing the electrical wiring diagram.

6) An enclosure type number shall be marked on the industrial control panel enclosure

Table 409.3 Other Articles

Equipment/Occupancy	Article / Section
Branch Circuits	210
Luminaires	410
Motors, Motor Circuits and Controllers	430
Air-conditioning and refrigerating equipment	440
Capacitors	460.8, 460.9
Hazardous (Classified) Locations	500, 501, 502, 503, 504, 505
Commercial garages; aircraft hangars; motor fuel dispensing facilities; bulk storage plants; spray application, dipping, and coating processes; and inhalation anesthetizing locations	511, 513, 514, 515, 516, and 517 Part IV
Cranes and hoists	610
Electrically driven or controlled irrigation machines	675
Elevators, dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts	620
Industrial machinery	670
Resistors and reactors	470
Transformers	450
Class 1, Class 2, and Class 3 Remote-Control, Signaling, and Power-Limited Circuits	725

Substantiation: The panel has revised Article 409 as recommended in Proposal 11-5 to incorporate material from Comments 11-6, 11-7, and 11-8.
Panel Meeting Action: Accept
Number Eligible to Vote: 14
Ballot Results: Affirmative: 11 Negative: 3
Explanation of Negative:
BUNCH: I vote negative on this panel action because the panel proposal has too many and significant changes in total to be approved without proper opportunity for public comment. Creating this article can mislead AHJ by approving a panel to this requirement and having an unsafe situation.
In addition, industrial control panels are more than adequately covered by the appropriate product standards. The applicable product standards cover many more items than can reasonably be included in the code, such as pressure, pipe strength and mechanical which must be met before the product is listed.
COX: Neither the proposal nor this comment provided any justification for adding article 409. Some of the substantiations mentioned in the several proposals and comments was that this article will provide minimum requirements to facilitate the safe installation and inspection of industrial control panels; however, no evidence of safety problems to personnel or equipment was presented. Since most of the requirements in new Article 409 are found elsewhere in the NEC, the AHJ can presently disallow use of industrial control panels that they deem unsafe. Consider panels that are designed for 115 volt, single phase use: to require such a panel to be marked with the short circuit current rating and an electrical wiring diagram along with the voltage, frequency, no. of phases and full load current is prohibitive and unneeded and will negate the use of panels engineered, designed and built at industrial owner's facilities.
TODD: This new section of the code adds product requirements to the code. These products are already covered by UL 508A and when listed will comply with all these requirements. Product requirements should be in product standards and covered by listing and not included in the NEC. There are additional requirements in UL 508A that will not now be covered by a product that is not listed and evaluated in the field by an electrical inspector. Field evaluations by product safety engineers is a way already available to inspectors when non-listed panels are used. Encouraging non-listed panels, thereby not evaluating to the complete standard UL 508A is not a good idea, but is promoted by this addition. This section does not give installation guidance of a product but requirements for what should be in the product, duplicating UL 508A.
This article will allow panels in the field that do no comply with all the requirements of UL 508A.

11-4 Log #217 NEC-P11 **Final Action: Reject**
(409 (New))

Submitter: Gordon C. Davis, Moeller Electric Corp.
Comment on Proposal No: 11-5
Recommendation: Reject new Article 409, except for short circuit marking requirement.
Add new text to last paragraph of 430-8: "Equipment approved as a unit and using motor controllers shall be marked with short circuit rating."
Substantiation: Proposed new Article 409 contains information that is redundant to NFPA 70 and other information that belongs in product standards.
Short circuit rating marking requirement is found in UL 508A and has been accepted by Code-Making Panel 11 for controllers and in Article 670 for panels. This marking would help the Authority Having Jurisdiction establish the suitableness of the installation.
Panel Meeting Action: Reject
Panel Statement: Proposed Article 409 will provide specific requirements to Authorities Having Jurisdiction on the construction and installation of Industrial Control Panels.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

11-5 Log #736 NEC-P11 **Final Action: Reject**
(409 (New))

Submitter: Melvin K. Sanders, TECo., Inc.
Comment on Proposal No: 11-5
Recommendation: This proposal should be rejected.
Substantiation: I agree with the negative comments made. In addition, with so much duplicated material, it will be a difficult task to stay coordinated in future Editions.
Panel Meeting Action: Reject
Panel Statement: Proposed Article 409 will give specific guidance to AHJ's for construction and installation of Industrial Control Panels. New requirements such as the one for marked short-circuit current ratings are not found elsewhere in the Code.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 12 Negative: 2
Explanation of Negative:
BUNCH: I vote negative on this panel action, panel should have accepted the comment which was to reject the proposal of creating a new article. See added comments on 11-3a.
COX: See my explanation of negative vote on Comment 11-3a.

11-6 Log #1981 NEC-P11 **Final Action: Reject**
(409 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 11-5
Recommendation: Accept the proposal in principle and in part. Include the definition and the contents of the proposed 409.110 in Part VIII of Article 430, as follows:
VIII Motor Control Centers and Industrial Control Panels
430.92 General. Part VIII covers motor control centers and industrial control panels installed for the control of motors, lighting, and power circuits.
430.93 Industrial Control Panels.
(A) Definition. An industrial control panel is an assembly of a systematic and standard arrangement of one or more motor controllers with one or more components such as overload relays, fused disconnect switches, and circuit breakers and related control devices such as pushbutton stations, selector switches, timers, switches, control relays and the like with associated wiring, terminal blocks, pilot lights and similar components.
(B) Requirements. The components of industrial control panels shall comply with the provisions of this part and all other provisions of this Code that would apply if they were separately installed.
(C) Supply Conductor Ampacity. The size of the control panel supply conductor shall have an ampacity not less than 125 percent of the full-load current rating of all resistance heating loads plus 125 percent of the full-load current rating of the highest rated motor plus the sum of the full-load current ratings of all other connected motors and apparatus based on their duty cycle that may be in operation at the same time.
(D) Enclosures. Enclosures for industrial control panels shall comply with 430.91.
430.94 Overcurrent Protection. Motor control centers and industrial control panels shall be provided with overcurrent protection in accordance with Parts I, II, and IX of Article 240.
(A) Motor Control Centers. The ampere rating or setting of the overcurrent protective device shall not exceed the rating of the common power bus. This protection shall be provided by (1) an overcurrent protective device located ahead of the motor control center or (2) a main overcurrent protective device located within the motor control center.
(B) Industrial Control Panels. The main overcurrent protective device shall be either ahead of or within the industrial control panel. Where provided within the control panel, the overcurrent protection shall consist of a single circuit breaker or set of fuses and the supply conductors shall be considered either as feeders or as taps as covered by 240.21. The rating shall be in accordance with Part V of this article.
430.95 Service-Entrance Equipment. Where used as service equipment, each motor control center and each industrial control panel shall be provided with a single main disconnecting means to disconnect all ungrounded service conductors.
Exception: For motor control centers, a second service disconnect shall be permitted to supply additional equipment.
Where a grounded conductor is provided, the motor control center or industrial control panel shall be provided with a main bonding jumper, sized in accordance with 250.28(D), within one of the sections for connecting the grounded conductor, on its supply side, to the motor control center or industrial control panel equipment ground bus.
Exception: High-impedance grounded neutral systems shall be permitted to be connected as provided in 250.36.
430.96 Grounding. Multisection motor control centers and industrial control panels shall be bonded together with an equipment grounding conductor or an equivalent grounding bus sized in accordance with Table 250.122. Equipment grounding conductors shall terminate on this grounding bus or to a grounding termination point provided in a single-section motor control center or industrial control panel.
430.97 Busbars and Conductors.
(A) Support and Arrangement. Busbars shall be protected from physical damage and be held firmly in place. For motor control centers, other than for required interconnections and control wiring, only those conductors that are intended for termination in a vertical section shall be located in that section.
Exception: Conductors shall be permitted to travel horizontally through vertical sections where such conductors are isolated from the busbars by a barrier.
(B) Phase Arrangement. The phase arrangement on 3-phase horizontal common power and vertical buses shall be A, B, C from front to back, top to bottom, or left to right, as viewed from the front of the motor control center. The B phase shall be that phase having the higher voltage to ground on 3-phase, 4-wire, delta-connected systems. Other busbar arrangements shall be permitted for additions to existing installations and shall be marked.
Exception: Rear-mounted units connected to a vertical bus that is common to front-mounted units shall be permitted to have a C, B, A phase arrangement where properly identified.
(C) Minimum Wire-Bending Space. The minimum wire-bending space at the motor control center terminals and minimum gutter space, and at the main supply terminals of an industrial control panel, shall be as required in ~~Article~~ 312.6. For industrial control panels the minimum wire bending space at other terminals in shall be in accordance with 430.10(B) and the gutter space shall comply with 312.8.

(D) Spacings. Spacings between motor control center bus terminals and other bare metal parts shall not be less than specified in Table 430.97.
(E) Barriers. Barriers shall be placed in all service entrance motor control centers to isolate service busbars and terminals from the remainder of the motor control center.
430.98 Marking.
(A) Motor Control Centers. Motor control centers shall be marked according to 110.21, and such marking shall be plainly visible after installation. Marking shall also include common power bus current rating and motor control center short-circuit rating.
(B) Motor Control Units. Motor control units ~~in a motor control center~~ shall comply with 430.8.
(C) Industrial Control Panels. A control panel shall be marked in a manner that is plainly visible after installation with the information in (1), through (4), and shall provide within its enclosure the information in (5):
(1) Manufacturers name, trademark or other descriptive marking by which the organization responsible for the product can be identified
(2) Supply voltage, phase, frequency, and full-load current
(3) Short-circuit current rating of the industrial control panel based on one of the following:
a. short circuit current rating of a listed and labeled assembly
b. short circuit current rating established utilizing an approved method
FPN: UL508A-2001 Supplement SB is an example of an approved method.
(4) If the control panel is intended as service equipment it shall be marked to identify it as being suitable for use as service equipment.
(5) Electrical wiring diagram or the number of the index to the electrical drawings showing the electrical wiring diagram.

Substantiation: The proposal offers very little that is not already in the NEC, however, the material that is new is important and may deserve a place. The submitter, who happens to have built and inspected many industrial control panels over the years, is in substantial agreement with the negative votes and would not be opposed to its continued rejection. However, the article only failed by a single vote. In the event a favorable two-thirds vote develops on the panel to go forward with the material, this comment is offered as a compromise to a new article, which appears to be complete overkill. The solution is to fold the subject into Part VIII of Article 430, where the majority of its provisions were taken in the first place. This comment offers a fully developed implementation of this idea. In so doing it avoids placing duplicative requirements in a new article. Duplicating requirements in the manner suggested in the proposal is always fraught with danger because inadvertent correlation errors can and usually do creep in over time. An analysis of the specific provisions follows:

430.93. This new section receives the information that is unique to the industrial control panel category. The definition is essentially as proposed, but adjusted to require at least one motor controller. This brings it within the scope of Article 430. The requirements paragraph reminds readers that this equipment is not a black box. The components are elements of branch circuits and feeders and must follow the applicable code requirements that apply to any such component, even if installed independently. Then there are a few specialized requirements that follow in the remainder of Part VIII. The supply ampacity and enclosure provisions follow those suggested by the proposal.

430.94. This section gets split, with industrial control panels falling into a new subsection. The rating is cross-referenced to Part V of Article 430 because as submitted 409.21(C) of the proposal essentially directly copied 430.62. The reference has been broadened to all of Part V because if the control panel serves other loads 430.63 will apply instead.

430.95. Industrial control panels get added along side motor control centers when used as service equipment, since the proposed requirements are identical with the exception of the allowance for a second service disconnect for a motor control center, which has been modified to retain the application for motor control centers only. The proposed requirement for the disconnecting means to be SUSE has not been repeated because it is adequately addressed elsewhere in the NEC.

430.96. The grounding requirements are equivalent so this is a simple fit.

430.97. The busbar requirements are equivalent, so (A) and (B) treat them equally. The vertical section rule in (A) only applies to motor control centers, and has been editorially modified accordingly. Item (C) is more complicated. The proposal only provides 430.10(B) bending space. This is appropriate for motor controllers, but the spacing at the main terminals or main device should follow the traditional spacing rules for equivalent terminals in other equipment, and this comment proposes adherence to 312.6 for that reason. Note that this comment corrects a Style Manual violation in the existing Code due to a whole article reference. The remaining rules do not require modification.

430.98. This section gets the marking rules essentially as proposed in a new subsection.

Panel Meeting Action: Reject
Panel Statement: Proposed Article 409 will give specific guidance to AHJ's for construction and installation of Industrial Control Panels. Motor Control Centers and Industrial Control Panels are different products. Locating the Industrial Control Panel requirements in a separate article will make the them easier to find and apply.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 14

11-7 Log #2859 NEC-P11 **Final Action: Accept in Principle**
(409 (New))

Submitter: Todd F. Lottmann, Cooper Bussmann
Comment on Proposal No: 11-5
Recommendation: Accept this proposal in principle as revised by Mr. Wright's affirmative comment and with the additional revisions shown here:

409.21(B)(2) A single main overcurrent protective device located within the control panel. Where overcurrent protection is provided ~~for the control panel~~ as part of the control panel, ~~overcurrent protection shall consist of a single circuit breaker or set of fuses and~~ the supply conductors shall be considered either as feeders or taps as covered by 240.21.

409.110(B) Phase Arrangement. The phase arrangement on 3-phase horizontal common power and vertical buses shall be A, B, C from front to back, top to bottom, or left to right as viewed from the front of the ~~motor control center~~ industrial control panel. The B phase shall be that phase having the higher voltage to ground on 3-phase, 4-wire, delta-connected systems. Other busbar arrangements shall be permitted for additions to existing installations and shall be marked.

Substantiation: This proposal should be accepted in principle as modified in the recommendation above. Proposal 11-5 provides a very important step towards assuring the safe installation and construction of industrial control panels. The addition of new article 409 will provide minimum requirements to facilitate the safe installation and inspection of industrial control panels.

Numerous concerns were voiced in the negative comments supplied in the balloting and the reversal of panel action from accept to reject shows a need for clarification of the issues surrounding this proposal. The following items provide substantiation for the inclusion of this new article.

1) Industrial control panels have unique conditions surrounding them which support the need for a set of minimum safety requirements as contained in the proposed Article 409.

• Industrial control panels can be moved around from installation to installation thus encountering varying electrical systems, environments, grounding means, and fault current levels. Therefore, it is critical to supply the ratings associated with the industrial control panel assembly in order to insure a safe installation. The marking requirements, construction requirements, and installation requirements outlined in this article will facilitate the safe installation and application of this type of equipment.

• Many industrial control panels are purchased from outside the country and are not constructed to the minimum safety levels mandated by the NEC. Providing this article will increase the usability of the code requirements associated with industrial control panels as they are located in one area.

• Not all industrial control panels are assembled according to a product standard. The inclusion of this new article will provide minimum safety requirements for field assembled panels where product standards are not used as pointed out in Mr. Cox's negative comment with the statement "In industry, empty control panels are purchased and then equipment is added."

• There are an increasing number and variety of components, devices, and equipment being used in industrial control panels and this will work to ensure their safe application.

2) This new article will provide a definition for industrial control panels that is long overdue. This will work to reduce confusion surrounding what is an industrial control panel and what is not.

3) Many of the negative comments refer to the absence of a need for the creation of this new article. Given the above consideration and the recent creation of UL508A, the need for this article is supported as UL508A was created to satisfy a need in the industry.

4) Many of the negative comments refer to a concern over duplication of requirements from elsewhere in the code. This proposal provides a prime example of an increase in usability of the code as it will locate the requirements in one area. This supports the task given to the TCC for increasing usability where possible. Also, it is important to note that 90.3 still applies for those situations which are not addressed in Article 409.

5) The concern over the existence of product standards and possible lack of correlation is understandable, however product standards have to follow the minimum safety requirements of the code and any differences need to be accounted for with revisions to the product standard. This is their reason for existing as they can be used to ease inspection with the permission granted in 110.3(B). Equipment intended to be installed in an electrical installation governed by the NEC need to meet the minimum levels of safety required by the NEC and localizing these requirements will facilitate this.

The revisions recommended in this comment address a concern voiced in the negative comments from balloting and to correct the deletion of the use of the feeder tap rules in 240.21 when overcurrent protection is supplied as part of the equipment.

This proposal takes a big step towards assuring the safe installation and construction of industrial control panels, which up until this point have been scattered in various product standards and sections of the NEC and, thus, often ignored.

Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and substantiation on Comment 11-3a.
Number Eligible to Vote: 14
Ballot Results: Affirmative: 11 Negative: 3

Explanation of Negative:

BUNCH: I vote negative on this panel action because the panel proposal has too many and significant changes in total to be approved without proper opportunity for public comment. Creating this article can mislead AHJ by approving a panel to this requriement and having an unsafe situation.

In addition, industrial control panels are more than adequately covered by the appropriate product standards. The applicable product standards cover many more items than can reasonably be included in the code, such as pressure, pipe strength and mechanical which must be met before the product is listed.

COX: See my explanation of negative vote on Comment 11-3a.

TODD: See my explanation of negative vote on Comment 11-3a.

11-8 Log #3049 NEC-P11 **Final Action: Accept in Principle**
(409)

Submitter: Alan Manche, Schneider Electric/Square D Co.
Comment on Proposal No: 11-5
Recommendation: The panel should reconsider proposal 11-5 and accept in principle using the original proposed text and include the revised wording suggested by Mr. Wright in his affirmative comment.

409.1 Scope

FPN: UL 508A is a safety standard for Industrial Control Panels.

409.3 Other Articles. Control Panels for specific type of equipment addressed in other articles of this Code shall be constructed and installed in accordance with those specific articles.

409.21(A) General. Control Panels shall be provided with overcurrent protection in accordance with Parts I, II, IX of Article 240. ~~Overcurrent protection for the control panel shall be provided by either fuses or circuit breaker~~

409.21(B)(2) A single main overcurrent protective device located within the control panel. ~~Where overcurrent protection is provided for the control panel as part of the control panel, overcurrent protection shall consist of a single circuit breaker or set of fuses and the supply conductors shall be considered either as feeders or taps as covered by 240.21.~~

409.106 Spacings. Spacings between ~~terminals and other~~ live bare metal parts in feeder circuits shall not be less than specified in Table 430.97.

The text from proposal 11-5 and the supported revisions above are include below for the panel to view the entire article as proposed by this comment.

Article 409 – Industrial Control Panels

I. General

409.1 Scope. This article covers industrial control panels intended for general use and operating from a voltage of 600 volts or less.

FPN: UL 508A is a safety standard for Industrial Control Panels.

409.2 Definitions.

Control Panel. An assembly of a systematic and standard arrangement of two or more components such as motor controllers, overload relays, fused disconnect switches, and circuit breakers and related control devices such as pushbutton stations, selector switches, timers, switches, control relays and the like with associated wiring, terminal blocks, pilot lights and similar components.

409.3 Other Articles. Control Panels for specific type of equipment addressed in other articles of this Code shall be constructed and installed in accordance with those specific articles.

II. Installation

409.20 Conductor – Minimum Size and Ampacity. The size of the control panel supply conductor shall have an ampacity not less than 125 percent of the full-load current rating of all resistance heating loads plus 125 percent of the full-load current rating of the highest rated motor plus the sum of the full-load current ratings of all other connected motors and apparatus based on their duty cycle that may be in operation at the same time.

409.21 Overcurrent Protection.

(A) General. Control Panels shall be provided with overcurrent protection in accordance with Parts I, II, and IX of Article 240. ~~Overcurrent protection for the control panel shall be provided by either fuses or circuit breakers.~~

(B) Location. This protection shall be provided by either,

(1) an overcurrent protective device located ahead of the control panel or

(2) a single main overcurrent protective device located within the control panel. ~~Where overcurrent protection is provided for the control panel as part of the control panel, overcurrent protection shall consist of a single circuit breaker or set of fuses and the supply conductors shall be considered either as feeders or taps as covered by 240.21.~~

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

Exception: Where one or more instantaneous trip circuit breakers or motor short-circuit protectors are used for motor branch-circuit short-circuit and ground-fault protection as permitted by 430.52(C), the procedure specified above for determining the maximum rating of the protective device for the circuit supplying the control panel shall apply with the following provision: For the purpose of the calculation, each instantaneous trip circuit breaker or motor short-circuit protector shall be assumed to have a rating not exceeding the maximum percentage of motor full-load current permitted by Table 430.52 for the type of control panel supply circuit protective device employed.

Where no branch-circuit short-circuit and ground-fault protective device is provided with the control panel, the rating or setting of the overcurrent protective device shall be based on 430.52 and 430.53, as applicable.

409.30 Disconnecting Means. Disconnecting means that supply motor loads shall comply with Part IX of Article 430.

409.60 Grounding. Multi-section control panels shall be bonded together with an equipment grounding conductor or an equivalent grounding bus sized in accordance with Table 250.122. Equipment grounding conductors shall terminate on this grounding bus or to a grounding termination point provided in a single-section control panel.

I. Construction Specifications

409.100 Enclosures. Enclosures shall be made of moisture-resistant, noncombustible material. Table 430.91 shall be used as the basis for selecting control panel enclosures for use in specific locations other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, corrosion, or contamination that may occur within the enclosure or enter via the conduit or unsealed openings. These internal conditions shall require special consideration by the installer and user. An enclosure type number shall be marked on the control panel enclosure.

409.102 Busbars and Conductors. Control panels utilizing busbars shall comply with the following:

(A) Support and Arrangement. Busbars shall be protected from physical damage and be held firmly in place.

(B) Phase Arrangement. The phase arrangement on 3-phase horizontal common power and vertical buses shall be A, B, C from front to back, top to bottom, or left to right, as viewed from the front of the motor control center. The B phase shall be that phase having the higher voltage to ground on 3-phase, 4-wire, delta-connected systems. Other busbar arrangements shall be permitted for additions to existing installations and shall be marked.

409.104 Wiring Space in Control Panels.

(A) General. Control panel enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless adequate space for this purpose is provided. The conductors shall not fill the wiring space at any cross section to more than 40 percent of the cross-sectional area of the space, and the conductors, splices, and taps shall not fill the wiring space at any cross section to more than 75 percent of the cross-sectional area of that space.

(B) Wire Bending Space. Wire bending space shall be in accordance with the requirements in 430.10(B).

409.106 Spacings. Spacings between ~~terminals and other~~ live bare metal parts in feeder circuits shall not be less than specified in Table 430.97.

409.108 Service-Entrance Equipment. Where used as service equipment, each control panel shall be provided with a single main disconnecting means to disconnect all ungrounded service conductors. The disconnecting means shall be of the type that is suitable for service applications.

Where a grounded conductor is provided, the control panel shall be provided with a main bonding jumper, sized in accordance with 250.28(D), for connecting the grounded conductor, on its supply side, to the control panel equipment ground bus or terminal.

409.110 Marking. A control panel shall be marked with the following information that is plainly visible after installation:

1) Manufacturers name, trademark or other descriptive marking by which the organization responsible for the product can be identified

2) Supply voltage, phase, frequency, and full-load current

3) Short-circuit current rating of the industrial control panel based on one of the following:

a. short circuit current rating of a listed and labeled assembly

b. short circuit current rating established utilizing an approved method

FPN: UL508A-2001 Supplement SB is an example of an approved method

4) If the control panel is intended as service equipment it shall be marked to identify it as being suitable for use as service equipment.

5) Electrical wiring diagram or the number of the index to the electrical drawings showing the electrical wiring diagram.

Substantiation: This new article will enhance the electrical safety of control panels assembled in the field that are currently not listed today as there is currently no guidance for the installer or the electrical inspector to ensure electrical safety for the numerous control panels that are not listed. An article for control panels is not a unique concept as Article 409 parallels similar articles in the NEC such as 404 for switches and article 408 for panelboards and switchboards. Mr. Bunch takes the position that this article would actually drive control panel manufacturers to stop listing equipment and only build to them to comply with this article. Is this actually a valid fear? It is not valid with respect to article 404 (switches) or 408 (panelboards). What about the control panels that are assembled in the field today such as lighting control panels, or a small conveyor system control panel neither of which are listed and no guidance is provided for safe installation? Mr. Cox also makes the point in his comment that "equipment control panels are purchased and then equipment is added in the field." This article provides the necessary guidance for a safe installation and enforceable text for the inspector. If listing is a concern and CMP-11 is going to obliviously assume all panels are listed either as a control panel or part of another assembly, then the panel should require all control panels to be listed. Rejecting the proposed text in proposal 11-5 fails to address the safety concerns of control panels that are not listed.

Let's review the negative comments:

Industry Standards

"Most of these products have their own product safety standards and listing categories."

"As end product standards (UL 508A, NFPA 79, etc.) already exist for control panels, I see no need for the addition of this proposal to the NEC."

"In industry, empty control panels are purchased and then equipment is added."

"the construction of a control enclosure which is already covered in an industry standard (i.e., UL 508A)"

How is rejecting this proposed article address the safe installation of those panels and equipment that are not listed? For the products that are listed this article does not create a conflict with the listing nor impose additional requirements. It simply imposes minimum requirements for all devices regardless of how they are created following the model of NEC articles 404 and 408.

Assembly and Inspection

"The design and construction of a control panel exceeds the scope of electricians in the field and places an unnecessary burden on the Authority Having Jurisdiction to inspect each nonlisted control panel. Leave the responsibility with the manufacturers of control panels to provide listed products that comply with nationally recognized standards."

The thought that electricians do not have the ability to design and construct control equipment is disturbing. These folks are highly qualified and perform installation and maintenance for such control panels today. As for the burden placed on the inspector, please ask the inspector members (IAEI) of panel 11as I'm sure they will share the present burden is extraordinary since they have no guidance in the NEC today for the installation of a control panel. This article will close that gap.

Since the NEC is adopted in all 50 states in some manner, I would invite CMP-11 to review activity in the state of Washington with regard to control panel acceptance. An entire section of the WAC rules addresses the safe installation of control panels on industrial machines. Basically two methods exist in order to receive approval by the inspector: 1) Use a Listed assembly or 2) By department evaluation showing compliance with appropriate codes and standards. The inspection community is having to address the safety concerns with control panels which are not well addressed in the NEC as is evident from the state of Washington having to introduce specific rules to ensure the safe installation of control panels on industrial machinery.

Other NEC Articles Applicable

"The construction of such panels requires the use of provisions in many sections of the Code. The proposal does not include all those provisions while duplicating several others,"

I agree with Mr. Haas that "The construction of such panels requires the use of provisions in many sections of the Code. The proposal does not include all those provisions while duplicating several others," however, the basic arrangement of the NEC found in 90.3 must be kept in mind. Much of the duplicated information comes from Article 430 which is currently only applicable to motor control. Control panels do exist without any motor control (lighting control, motion detection,…), therefore article 430 would not be applicable. It is also true that many sections of the NEC apply to a control panel and it is not necessary to duplicate that information in this article. The grounding information is specific for control panel construction, it does not permit the grounding requirements in Article 250 to be ignored. Chapters 5 and 7 modify chapters 1 through 4 so article 409 is consistent with other article such as Article 404 for switches and Article 408 for Panelboards.

I encourage the code panel to reconsider this proposed new article and take this opportunity to enhance electrical safety that currently does not exists for those control panels that are not listed.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and substantiation on Comment CC1101.

Number Eligible to Vote: 14

Ballot Results: Affirmative: 11 Negative: 3

Explanation of Negative:

BUNCH: See my explanation for negative vote on Comment 11-7.

COX: See my explanation of negative vote on Comment 11-3a.

TODD: See my explanation of negative vote on Comment 11-3a.

ARTICLE 410 — LUMINAIRES (LIGHTING FIXTURES), LAMPHOLDERS, AND LAMPS

18-26 Log #832 NEC-P18 **Final Action: Accept**
(410.1)

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

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 18-50

Recommendation: The Technical Correlating Committee advises that Article Scope statements are the responsibility of the Technical Correlating Committee and the Technical Correlating Committee "Rejects" the Panel Action. The recommended FPN contains a requirement and interpretation of the definition of "luminaire" which is not appropriate in an FPN. The Technical Correlating Committee directs the panel to reconsider the proposal and either modify the scope statement to include coverage of the contemplated material or develop a specific comment to Code-Making Panel 1 to modify the definition of "luminaire" to reflect the desire of the panel. 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 and to revise the scope as follows:

"410.1 Scope.

This article covers luminaires (lighting fixtures), lampholders, pendants, incandescent filament lamps, arc lamps, electric-discharge lamps, decorative lighting products, lighting accessories for temporary seasonal and holiday use, portable flexible lighting products, and the wiring and equipment forming part of such products and lighting installations."

Panel Statement: The panel chose the option to expand the scope of Article 410 to cover the new material.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-27 Log #3659 NEC-P18 **Final Action: Accept in Principle**
(410.1, FPN (New))

Submitter: Marcelo M. Hirschler, GBH International

Comment on Proposal No: 18-50

Recommendation: Add text to read as follows:

410.1 Scope.

This article covers luminaires (lighting fixtures), lampholders, pendants, incandescent filament lamps, arc lamps, electric-discharge lamps, the wiring and equipment forming part of such lamps, luminaires (fixtures), and lighting installations.

FPN: With regard to the applicability of this article, luminaires include decorative lighting products and accessories for temporary seasonal and holiday use, and portable flexible lighting products.

Substantiation: The original proposal was accepted in principle by the technical committee (CMP 18) but rejected by the Technical Correlating Committee because it is the responsibility of CMP 1 to address definitions. The proposed change will not cause CMP 18 to overlap with the responsibilities of CMP 1, while still making it clear to the users of the NEC that decorative lighting products and accessories for temporary seasonal and holiday use, and portable flexible lighting products are covered by this article.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 18-26.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-28 Log #3848 NEC-P18 **Final Action: Accept in Principle**
(410.1, FPN (New))

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

Comment on Proposal No: 18-50

Recommendation: Revise to read as follows:

410.1 Scope. This article covers luminaires (lighting fixtures), lampholders, pendants, incandescent filament lamps, arc lamps, electric-discharge lamps, the wiring and equipment forming part of such lamps, luminaires (fixtures), and lighting installations.

FPN: With regard to the applicability of this article, luminaires include decorative lighting products and accessories for temporary seasonal and holiday use, and portable flexible lighting products.

Substantiation: The original proposal was accepted in principle by the technical committee (CMP 18) but rejected by the Technical Correlating Committee because it is the responsibility of CMP 1 to address definitions. The proposed change will not cause CMP 18 to overlap with the responsibilities of CMP 1, while still making it clear to the users of the NEC that decorative lighting products and accessories for temporary seasonal and holiday use, and portable flexible lighting products are covered by this article.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 18-26.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-29 Log #833 NEC-P18 **Final Action: Accept**
(410.2)

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 18-51

Recommendation: The Technical Correlating Committee directs the panel to reconsider the proposal along with the following comments:

1) Is the panel implying that Article 410 applies in addition to Article 700 and 701 for unit equipment, or does the panel intend that Article 410 not apply in any manner? If Article 410 applies and is modified by the requirements

in 700 and 701, the Technical Correlating Committee questions the need for a reference since 90.3 already conveys that Chapters 1 through 4 apply to all installations.

2) The panel needs to reconsider this proposal in conjunction with Proposal 18-52a because the two actions provide different text for the same section.

3) The NEC Style Manual requires that the "Other Article" information be presented in a table format and the Technical Correlating Committee directs the panel to reformat this material into a table.

4) The panel should consider if a renumbering of Article 410 is required due to the lack of additional usable empty numbers within the Article parts. The Technical Correlating Committee notes that the "Other Articles" section should be 410.3 to be consistent with the NEC Style Manual and other code articles. This action will be considered by the panel as a public comment.

The Technical Correlating Committee directs that this proposal be sent to Code-Making Panel 13 for information relative to the reference to Articles 700 and 701.

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 and rejects Proposal 18 51.

Panel Statement: In response to TCC question (1), the panel does consider the luminaire portion of unit equipment to be within the scope of Article 410. When such equipment is installed in emergency or legally required standby systems, the provisions of Articles 700 and 701 modify the provisions of Article 410. CMP 18 agrees with the TCC that the reference to Articles 700 and 701 is not necessary.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-30 Log #834 NEC-P18 **Final Action: Hold**
(410.2)

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 18-52a

Recommendation: It was the action of the Technical Correlating Committee that this Proposal be reconsidered and correlated with the action on Proposal 18-51. See Technical Correlating Committee action on Proposal 18-51. 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: Hold

Panel Statement: This comment is held because it would propose something that could not be properly handled within the time frame for processing the Report on Comments. CMP 18 also desires that Proposal 18-52a be held. CMP 18 rejects Proposal 18-51.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-31 Log #1856 NEC-P18 **Final Action: Accept in Principle**
(410.4(D))

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

Comment on Proposal No: 18-53

Recommendation: The proposal should be accepted in principle. Add the following sentence to the end of the paragraph:

"Other luminaires (lighting fixtures) located in this zone shall be suitable for damp locations, or suitable for wet locations where subject to shower spray."

Substantiation: The panel statement is correct. However, it may be necessary to restate the obvious.

Panel Meeting Action: Accept in Principle

Revise the text of 410.4(D) to read as follows and insert as the last sentence.

"Luminaires (lighting fixtures) located in this zone shall be listed for damp locations, or listed for wet locations where subject to shower spray."

Panel Statement: The panel has accepted the principle and has editorially revised the wording of the comment. In this case, the panel concludes that reiteration of the damp or wet location listing is necessary.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-32 Log #1965 NEC-P18 **Final Action: Accept in Principle**
(410.4(D))

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 18-53

Recommendation: The Panel should accept this proposal.

Substantiation: We agree with the substantiation provide by the submitter of the proposal. We also agree with the negative vote of Mr. Larson that noted that "this type of surface mounted luminaire is not suitable for installation in a bathtub and shower area." This proposal closes a loop-hole that is not addressed by current NEC language. There is significant justification from the safety point of view to warrant acceptance of this proposal. 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 Comment 18-31.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-33 Log #835 NEC-P18 **Final Action: Accept**
(410.4(E))

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 18-57

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

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: See the panel action and statement on Comment 18-35.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-34 Log #1964 NEC-P18 **Final Action: Accept in Principle**
(410.4(E))

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 18-57

Recommendation: The Panel should continue to accept this proposal in principle.

Substantiation: Luminaires (fixtures) subject to physical damage, using a mercury vapor or metal halide lamp, in sports arenas are often hit with basketballs, volleyballs, etc. The lamp envelope will often times break, glass shards will hit the floor (possibly injuring personnel in the area), and the lamp may continue to burn which further creates a UV radiatioin problem. Providing protected lens, a lens with a metal guard would eliminate the problem. Many facilities use fixtures set-up in this way, complete with a safety lanyard to "safety off" the fixture to a secure mooring in the event that the fixture is hit with a ball, etc. This proposed change would be a welcome addition to the NEC. This is a safety issue that begs to be addressed. 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 on Comment 18-35. The substantiation submitted with Comment 18-35 demonstrates that a plastic lens adequately protects against UV burns.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-35 Log #2598 NEC-P18 **Final Action: Accept**
(410.4(E) (New))

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

Comment on Proposal No: 18-57

Recommendation: Delete the words, "UV attenuating," from the re-wording proposed by Code Making Panel 18, such that 410.4(E) now reads:

Luminaires (fixtures subject to physical damage, using a mercury vapor or metal halide lamp, installed in playing and spectator seating areas of indoor sports, mixed-use, or all-purpose facilities shall be of the type that protects the lamp with a glass~~;~~ or ~~UV attenuating~~ plastic lens. Such luminaires (fixtures) shall be permitted to have an additional guard.

Substantiation: The purpose of the enclosure in the original submission was for mechanical protection, not UV attenuation. It is recommended to remove the words, "UV attenuating," from the Panel action. All plastic lenses provide UV attenuation, but the inclusion of these words in the article could cause confusion among AHJs regarding the acceptability of plastic lenses. The information I have provided is being supplied to substantiate that the words, "UV attenuating," are unnecessary due to the inherent nature of the plastics typically utilized for commercial lighting equipment.

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

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-36 Log #1035 NEC-P18 **Final Action: Accept in Principle**
(410.14(B) (New))

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 18-60
Recommendation: This proposal should remain accepted in part with an added exception or similar language to read: "Exception: Where electric-discharge luminaires are designed to be supported directly and solely from a box, access to wiring shall be permitted to be provided by removal of the luminaire."
Substantiation: "Electric-discharge luminaire" is a very broad term that includes many surface-mounted fixtures that are mounted directly to boxes, including those that use small PL lamps, circular flourescent lamps, and some small HID lamps. These luminaires are also "surface mounted." The rule appears to be directed at larger strip-type and other surface fluorescent fixtures that cover an area many times larger than the box, but that intent should be clearer. Unfortunately, "surface mounted" seems to be subject to various interpretations. The panel was wise to retain the word "concealed" or some people would also try to apply this rule to larger box-supported HID luminaires because they are mounted over "the opening of" a box.
Panel Meeting Action: Accept in Principle
Revise the text to read as follows:
"Access to Boxes. Electric-discharge luminaires (fixtures) surface mounted over concealed outlet, pull, or junction boxes and not designed to be supported solely by the outlet box shall be provided with suitable openings in the back of the luminaire (fixture) to provide access to the wiring in the box."
Panel Statement: Adding the words "not designed to be supported solely by the outlet box" accomplishes the intent of the submitter. Using positive language instead of the exception as submitted is in compliance with the NEC Style Manual.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-37 Log #377 NEC-P18 **Final Action: Reject**
(410.15(B))

Submitter: Robin Paul Roderick
Comment on Proposal No: 18-61
Recommendation: Code-making panel 18 is proposing to eliminate reference to metal poles from 410.15(B). Might it not be more correct and discriminatory in the specification and selection of the support/raceway to instead of deleting references to metal poles to add reference to "other approved support structures, such as concrete poles, fiber glass poles, etc." The key would be "approved".
Substantiation: Merely eliminating references to metal poles will open wide the doors for contractors to substitute inappropriate supports for the luminaires. Restricting the language will at least partially reclose that door.
Panel Meeting Action: Reject
Panel Statement: The panel is not eliminating reference to metal poles. This reference continues in the heading of 410.15(B). The panel is adding "nonmetallic poles" and adjusting the balance of the requirements to treat them the same. The substantiation provides no information that would explain why nonmetallic poles should be excluded.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-38 Log #1857 NEC-P18 **Final Action: Accept**
(410.18 Exception No. 2 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-69
Recommendation: The proposal should be accepted in principle. At the opening of the new exception, insert the words "Where no equipment grounding conductor exists at the outlet,"
Substantiation: As worded at the proposal stage, a replacement fixture need not be grounded even if there is an equipment grounding conductor present. That does not agree with the rule for receptacles and seems unlikely to have been the panel intent. GFCI protection is never a substitute for grounding, although in this instance is a reasonable trade-off if no grounding conductor is available.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-39 Log #95 NEC-P18 **Final Action: Reject**
(410.30(C))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 18-78
Recommendation: Accept the proposal.
Substantiation: The fact that there are non-compliant installations described in the proposal is indication that this section is not as clear as it might be. The present phrase "listed assembly" can be interpreted that end-to-end fluorescent fixtures are such (which they are) and, therefore, suitable for a cord-connected supply method.
Panel Meeting Action: Reject
Panel Statement: The panel continues to reject the proposal because there are listed assemblies of cord-connected, ballasted luminaires.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-40 Log #90 NEC-P18 **Final Action: Reject**
(410.33)

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 18-81
Recommendation: Accept proposal.
Substantiation: The Panel states product markings instruct the installer on proper conductor temperature ratings. Why is this rule then necessary?
As long as it is in the Code it should include other than branch circuit conductors such as feeders and fixture wire in fixtures used as raceways per 410.31.
Panel Meeting Action: Reject
Panel Statement: The panel continues to reject the proposal because this section properly identifies the conductors it is applicable to. The substantiation indicates that all conductors, including feeders, should be included. Feeders are not intended to be run within luminaires and deleting the term "branch" would, as the submitter indicates, permit just that.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-41 Log #3474 NEC-P18 **Final Action: Reject**
(410.65(C))

Submitter: Richard I. Underwood, Applied Technical Services
Comment on Proposal No: 18-87
Recommendation: Add new text to read:
(C) Recessed Incandescent Luminaires (fixture) shall have thermal protection, designed to directly detect lamp heat, and shall be so identified as thermally protected.
Substantiation: Rebuttal to Panel action of Reject.
The test protocol of UL 1598 does not include any testing for unevenly applied insulation which may cover the luminaire bulb housing and not the remotely mounted insulation detector.
The existing UL 1598 procedures do not take into account the anticipated/expected abnormal conditions encountered when batt insulation is used and allowed to get too close to a luminaire bulb enclosure. Batt paper backing is commonly used in ceilings containing recessed luminaires and it is imperative that the luminaires be thermally protected so that surface temperatures cannot rise above 90C/194F.
Remotely mounted insulation detectors do not provide thermal detection or the thermal protection required by NFPA 70, 410.65. Such insulation detectors only react to the effect of an insulation blanket around them. These insulation detectors will work effectively to control the can temperature only if loose insulation is used and if that insulation covers the can and detector.
Recessed luminaires are sometimes inserted in a ceiling already containing batt insulation with the paper side down. Any luminaire thermal protection should be able to prevent surface temperature from rising above 90C/194F. A fixture using a remotely mounted insulation detector will not perform this function as required by 410.65(C).
A proposed change to UL 1598 is being prepared and will be submitted by UL shortly.
Panel Meeting Action: Reject
Panel Statement: The submitter did not define the meaning of his term "remote mounted thermal protector"; however, from the language of his recommendation, the panel believes he is referring to self-heating-type thermal protectors.
Because many recessed luminaires are suitable for a wide variety of lamps and trim configurations, temperature in the proximity of the lamp is variable. Self-heating-type thermal protectors prevent nuisance tripping due to this variability. Self-heating-type thermal protectors detect a change in temperature resulting from the addition of thermal insulation around the luminaire and provide protection against overheating due to thermal insulation around a recessed luminaire not designed for such use. Self-heating-type thermal protectors meet the intent of 410-65(C).
Sections 410.5 and 410.65 specify a 90ºC limit for materials surrounding luminaires but clearly anticipate correct installation with proper clearances observed. It is not the intent of 410.65(C) to apply the 90ºC limit to abnormal installation conditions.
Product standards contain test parameters; proposals regarding test methodologies should be made to the appropriate standards development organization for consideration.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-42 Log #1375 NEC-P18 **Final Action: Reject**
(410.66(B))

Submitter: Jon Hinnefeld, Gotham Lighting
Comment on Proposal No: 18-89
Recommendation: Retain the wording of 410.66(B) from the 2002 NEC. Delete text that was added by the Panel in the action taken on proposal 18-89.
Substantiation: No data has been supplied to substantiate the need to change the existing requirements. Decades of field experience with existing products do not show a need for change. The requirement, as written, cannot be practically applied. How is the installer to field install a means to prevent insulation from being placed above a luminaire? Any field built "box" that has a top would allow insulation to be placed above the luminaire. The only way to comply with the requirement is to build a box that extends all the way from the upper ceiling surface to the lower roof surface. In certain applications this would be impractical and incredibly expensive. This expense cannot be justified given the lack of substantiation for the change. Additionally, the requirement would be difficult to enforce uniformly since the phrase "where...insulation is required or planned" is vague and will lead to differing interpretations.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-45.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-45.
PIERCE: Code-Making Panel 18 concluded it was better to keep their heads buried in the sand than address the issues.
First issue: If the lising standard UL1598 does not adequately address accidental and unevenly applied insulation in end-use installations, the answer is not to require the field-constructed barrier. The answer is to provide direction to the standards developing organization to upgrade their requirements to address the issue.
The second issue: If the current wording of 410.66(B) of the 2002 NEC is not being enforced ("Thermal insulation shall not be installed...or, within 75 mm (3 in.) of the recessed luminaire's (fixture) enclosure, wiring..."), how is the new wording to promote increased enforcement? There seems to be some conclusive evidence in the hands of Code-Making Panel 18 by virtue of their Accept in Principle Panel Action. Requesting some unknown person (the electrician? the manufacturer? the installer? the building owner? who?) to provide a field-constructed barrier is not the appropriate response to that conclusive evidence.
Product standards exist to evaluate products use and reasonably foreseeable misuse. If there is an issue of a products misuse leading to an increased risk of fire, the correct response is to revise that product standard, and not bury our head in insulation (I mean sand).
ROSENBAUM: NEMA considers the new language of 410.66(B) to be vague. It is not always possible to determine if the installation of thermal insulation is required or planned at the time of luminaire installation. The luminaire listing requirements for thermal protection and labeling already address improper installation of insulation.
Also, while the panel statement on Comment 18-45 indicates that the field constructed barrier is not necessarily intended to be provided by the luminaire manufacturer, the new language of 410.66(B) states that "recessed luminaries…be provided with a field constructed barrier." This language could readily be interpreted as requiring the luminaire manufacturer to provide the insulation barrier.
Neither substantiated accident nor empirical data indicating that the current requirement is inadequate was submitted. Decades of acceptable field experience with millions of non type IC luminaries demonstrates that the current requirements are acceptable. The wording of the 2002 NEC 410.66(B) should be retained.
Comment on Affirmative:
WELLS: I am voting affirmative because I believe the compromise worked out by the panel enables consensus to be achieved. However, I do not agree with the sentence in the panel statement that the panel has restricted the application to areas identified as producing a hazard. The proposals involved were both submitted by individuals representing industrial companies. Exception No 4 is, therefore, not justified.

18-43 Log #3422 NEC-P18 **Final Action: Reject**
(410.66(B))

Submitter: Frederick L. Carpenter, Lithonia Lighting
Comment on Proposal No: 18-89
Recommendation: Delete the text that was added by the code-making panel. Retain the wording of 410.66(B) from the 2002 NEC.
Substantiation: There is no evidence to show that the existing requirements are inadequate. Listed recessed Non-IC incandescent and HID products are already provided with thermal protection, markings, and installation instructions to cover the submitter's concerns. Listed products are tested in an abnormal condition, with insulation placed up against them, to demonstrate the product's ability to turn itself off when insulation is present. The lack of supporting data indicates that the existing language in 410.66(B), along with the Listing requirements, has proven to be an adequate safeguard. Additionally, the requirement can be interpreted to indicate that the luminaire manufacturer is to supply the field installed means (box) for preventing insulation from being placed too close to the luminaire; this was not the code-making panel's intent. Also, this requirement would apply to all Non-IC recessed luminaires, forcing those that are known to run at very low operating temperatures such as linear fluorescent troffers, to have a box built around them.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-45.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-45.
PIERCE: See my Explanation of Negative Vote on Comment 18-42.
ROSENBAUM: See my explanation of negative vote on Comment 18-42.

18-44 Log #3423 NEC-P18 **Final Action: Reject**
(410.66(B))

Submitter: John D. Green, Holophane, an Acuity Brands Company
Comment on Proposal No: 18-89
Recommendation: Delete the wording as proposed in 18-89. The wording of the 2002 NEC text of 410-66(B) should be retained.
Substantiation: Evidence that the existing code requirements of 410-66(B) are not adequate is not substantiated by any data. Existing products without this requirement have been in field use for dozens of years with no indication that a change is necessary for an acceptable level of safety. In addition, the wording of the proposal applies to all recesses non-IC products, which would force enclosure luminaire types including low operating temperature troffers. The proposal cannot be implemented in any reasonable form since an enclosure would need to extend to the underside of the upper plenum surface to ensure insulation could not enter the protective box. Couple this need with the implication that the luminaire manufacturer must supply said enclosure and the requirement becomes impossible to implement. Since listed recessed Non-IC HID and incandescent products already incorporate thermal protection, and thermal insulation is provided with instructions to keep the material away from Non-IC rated recessed luminaires, the need and benefits of implementing such a change in the code becomes unnecessary, impractical and burdens the end user with additional costs.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-45.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-45.
PIERCE: See my Explanation of Negative Vote on Comment 18-42.
ROSENBAUM: See my explanation of negative vote on Comment 18-42.

18-45 Log #3473 NEC-P18 **Final Action: Reject**
(410.66(B))

Note: The Technical Correlating Committee directs that Proposal 18-89 and Comment 18-45 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Richard I. Underwood, Applied Technical Services
Comment on Proposal No: 18-89
Recommendation: Replace the current paragraph with the following:
(B) Installation: Recessed fixtures shall not be installed in spaces that may be insulated.
Exception: Recessed fixtures identified as suitable for insulation to be in direct contact with the fixture (Type IC).
Substantiation: Rebuttal to Panel Accept in Principle.
The panel's acceptance in principle recognizes that the potential for field installed insulation can present a problem for non IC luminaires.
An insulation barrier installed around luminaires may be effective in some cases, but if the barrier is made of cardboard or other combustible materials, blown in insulation may worsen the problem by pushing the cardboard onto the luminaire.
Further, the blown in insulation is often pumped into the attic and may actually fill up the cavity built around the luminaire. The panel's suggestion that the top be covered would prevent this scenario but might entrap heat that could be radiated away without the top.
A noncombustible barrier would be better, but the enforcement by AHJ would become a nightmare because they would not be able to determine if insulation is planned or required.
A better solution to fire prevention and inspection of luminaires is to completely prohibit use of non IC units in any space that CAN be insulated. IC rated units of all designs are available for almost the same cost as NON IC units.
Panel Meeting Action: Accept in Principle
Revise 410.66(B) to read:

(B) Installation. Where the installation of thermal insulation is required or planned, recessed luminaires (fixtures) not identified for contact with thermal insulation shall be provided with a field-constructed barrier to prevent insulation from being installed above or within 75 mm (3 in.) of the recessed luminaire's (fixture's) enclosure, wiring compartment, or ballast.

Panel Statement: CMP 18 does not conclude that it is necessary to prohibit the installation of luminaires in spaces that "may" be insulated. Rather, CMP 18 concludes that this section should address the installation of luminaires, not the installation of thermal insulation. The panel reinserted the word "thermal" as necessary to prevent confusion on the part of the installer. CMP 18 reiterates that thermal insulation used as sound attenuation is covered by 410.66(B). CMP 18 concludes that the field constructed barrier is not necessarily intended to be provided by the luminaire manufacturer.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 7 Negative: 4

Explanation of Negative:

O'BOYLE: There is no technical data to indicate that the present requirements do not provide an adequate level of safety, no substantiated accident data was provided.

The panel was concerned that this section should address the installation of luminaires, not the installation of insulation. The present wording of 410.65(B) provides an acceptable clearance value between thermal insulation and non-Type-IC recessed luminaires. This does address the installation of such a luminaire in a space that already contains insulation. Additionally, 410.65(B) provides guidance to the product safety standard UL 1598 which in turn contains product marking requirements that specify the correct clearance between thermal insulation and non Type-IC luminaires. These required luminaire markings correlating with 410.66 and instruct the installers of both the luminaire and thermal insulation to observe code required clearance. UL 1598 also requires thermal protection to address the improper installation of thermal insulation.

It seems that the new language could complicate inspections. Energy codes that require installation of thermal insulation also require the use of Type-IC luminaires in insulated areas to maximize energy efficiency. In cases where there are no energy code requirements, it is difficult if not impossible to determine if installation of thermal insulation is "planned". Accordingly, the proposed changes can result in misinterpretation, uneven application of the requirement and conflict with energy codes.

While the panel statement indicates that the field constructed barrier is not necessarily intended to be provided by the luminaire manufacturer, the new 410.66(B) is likely to be interpreted as requiring that an insulation barrier is required to be provided by the luminaire manufacturer.

The proper construction of a barrier is more dependent upon the type of thermal insulation used than the luminaire. Instructions to observe code required clearances are reiterated on the packaging provided with thermal insulation; many include details showing the correct barrier to use.

The wording of the 2002 NEC 410.66(B) should be retained.

PIERCE: See my Explanation of Negative Vote on Comment 18-42.

ROSENBAUM: NEMA considers the new language of 410.66(B) to be vague. It is not always possible to determine if the installation of thermal insulation is required or planned at the time of luminare installation. The luminaire listing requirements for thermal protection and labeling already address improper installation of insulation.

Also, while the panel statement indicates that the field constructed barrier is not necessarily intended to be provided by the luminaire manufacturer, the new language of 410.66(B) states that "recessed luminaires... be provided with a field-constructed barrier". This language could readily be interpreted as requiring the luminaire manufacturer to provide the insulation barrier.

Neither substantiated accident nor empirical data indicating that the current requirement is inadequate was submitted. Decades of acceptable field experience with millions of non-type-IC luminaires demonstrate that the current requirements are acceptable. The wording of the 2002 NEC 410.66(B) should be retained.

WELLS: The difficulty the panel is dealing with is that the NEC in 410.66(B) should deal with the installation of luminaires and avoid dealing with the installation of thermal insulation. Unfortunately, I do not believe we have accomplished this yet. The submitter's wording is not acceptable because it talks about "spaces that may be insulated" which is not possible to divine. The panel wording "Where the installation of thermal insulation is required or planned" is a bit better, but suffers the same problem. It is possible to determine if a building or energy code "require" insulation, but it is not possible to know whether or not it is "planned" and even if it is not planned when the luminaire is installed, it may be planned and installed later.

Futher, while the panel clearly does not intend the barrier to be provided (as spelled out in the panel statement) by the luminaire manufacturer, the language could be interpreted otherwise.

Consequently, while the existing wording is not satisfactory, the wording proposed by the submitter and the panel does not solve the problem leading to my negative vote.

18-46 Log #3897 NEC-P18 **Final Action: Reject**
(410.66(B))

Submitter: Michael S. O'Boyle, Lightolier Div. of Genlyte Thomas LLC

Comment on Proposal No: 18-89

Recommendation: Delete text added to 410.66(B) by panel action. Preserve 2002 NEC verbiage of 410.66(B).

Substantiation: There was not sufficient technical data to indicate that the present requirements are inadequate, no substantiated accident data was provided. The submitter offered only anecdotal supposition to support his opinion.

The present requirements properly address the potential for problems due to the field installation of thermal insulation. 410.65(C), 410.73(E) and 410.73(F) requires thermal protection of incandescent, fluorescent and high-intensity discharge luminaires. Product safety standard UL1598 contains thermal protection, test and product marking requirements that address the incorrect installation of thermal insulation around Non Type-IC luminaires. The luminaire markings required by UL1598 correlate with 410.66.

Luminaire markings required for listing, instruct the installers to observe code required clearance. These instructions are reiterated on the packaging provided with thermal insulation. It is already clear that it is the responsibility of the person installing a luminaire to ensure that any existing insulation is reliably held at the prescribed distance from the luminaire. Likewise, it is clearly the responsibility of the insulation installer to observe proper clearance to existing luminaires, as they must to flues, chimneys and heaters that are commonly in the same space. Under the present requirements, both of these conditions are considered.

Energy codes that require installation of thermal insulation also require the use of Type IC luminaires in insulated areas to maximize energy efficiency. In cases where there are no energy code requirements, it is difficult if not impossible to determine if installation of thermal insulation is "planned". Accordingly, the proposed changes can result in misinterpretation, uneven application of the requirement and conflict with energy codes.

The word "thermal" is important to the intent of 410.66(B) and should not be removed. 410.66(B) The heat retention property of the insulation is what is being addressed by the requirements. Sound insulation that acts as a thermal insulator is addressed by the current wording.

Two decades of acceptable field experience with millions of NON-IC Type luminaires prove the present requirements provide an acceptable level of safety. No evidence was presented to indicate that a requirement change is warranted.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-45.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 8 Negative: 3

Explanation of Negative:

O'BOYLE: See my explanation of negative vote on Comment 18-45.

PIERCE: See my Explanation of Negative Vote on Comment 18-42.

ROSENBAUM: See my explanation of negative vote on Comment 18-42.

18-47 Log #836 NEC-P18 **Final Action: Accept**
(410.73(F)(5) (New))

Submitter: Technical Correlating Committee on National Electrical Code®

Comment on Proposal No: 18-91

Recommendation: It was the action of the Technical Correlating Committee that further consideration be given to the comments expressed in the voting with respect to the substantiation of the listing requirement. This action will be considered by the panel as a public comment.

Substantiation: This is a direction from the National Electrical Code Technical Correlating Committee in accordance with 3-4.2 and 3-4.3 of the Regulations Governing Committee Projects.

Panel Meeting Action: Accept

Panel Statement: The panel has given further consideration to the comments expressed in the voting.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-48 Log #2600 NEC-P18 **Final Action: Accept in Principle**
(410.73(F)(5) (New))

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

Comment on Proposal No: 18-91

Recommendation: Revise the new text proposed by CMP 18, such that it reads as follows for absolute clarity:

Metal Halide Lamp Containment. Luminaires (fixtures) that use a metal halide lamp, other than a thick-glass parabolic reflector lamp (PAR), shall be provided with a containment barrier that encloses the lamp, or shall be provided with a physical means that only allows the use of a lamp that is ~~listed for~~ containment rated by the lamp manufacturer for operation in an open luminaire (fixture). Lamps that are containment rated for use in an open luuminaire shall be marked with the ANSI luminaire code, "O'

Substantiation: Consistent with NEMA's previously submitted comments on this matter, NEMA strongly recommends that the proposed language for this provision as amended by Code Making Panel 18 be rejected and be changed such that the original intent of the proposal is restored. NEMA supports the basiic intent of the original proposal, but does not support the language added by CMP 18 subjecting O-rated metal halide lamps to "listing", which is another way to describe third party certification.

The requirement for 'listing' of O-rated lamps is not justified. O-rated lamps meet ANSI containment test requriements developed specifically for this metal halide lamp type for applicatoin in an open fixture and are marked with the ANSI luminaire code "O". Lamp manufacturers that offer this special lamp type are already equipped for this test and currently perform the forced rupture tests and maintain the manufacturing processes necessary to ensure suitable performance in the field. Self certification has proven effective and should be maintained since:

1. The proposed requirement for third party certification has not been substantiated;
2. No evidence has been submitted that O-rated lamps have been the basis for any reported fireld incident;
3. The original proposal provides additional assurance for this application by requiring that open fixtures using O-rated lamps also be provided with a physical that only allows the use of a lamp that is properly containment rated.

Since NEMA's original comment submission on this matter, members of the Lamp Section and the NEMA Business Information Services Department undertook and completed a study to determine if there was any significant potential risk from non-NEMA imported O-rated lamps that could possibly justify third party listing. This possibility has been anecdotally recounted as a potential justificaiton by some CMP 18 members for a lamp listing requirement. Based on the results of this Special Statistical Report, which considered U.S. Census shipment data as well as NEMA's own statistical reporting data, NEMA finds there is no evidence that would warrant listing O-rated lamps. NEMA member metal halide lamps in the combined S & O-rated categories currently comprise 99.9 percent of the domestic market. Of the approximately 9 million lamps sold in this combined category, only approximately 7,000 lamps are estimated to be imported, and, of these, all 7,000 are believed to be S-rated, not O-rated types. Thus, concerns that non-compliant imported O-rated lamps will lead to a significant field issue are unfounded.

Reinterating from previously submitted comments, the original intent of the initial proposal should be maintained. In addition, the wording of the proposal should be clarified to avoid possible enforcement confusion.

The following wording is proposed to ensure absolute clarity:

Metal Halide Lamp Containment. Luminaires (fixtures) that use a metal halide lamp, other than a thick-glass parabolic reflector lamp (PAR), shall be provided with a containment barrier that encloses the lamp, or shall be provided with a physical means that only allows the use of a lamp that is containment rated by the lamp manufacturer for operation n an open luminaire (fixture). Lamps that are containment rated for use in an open luminaire shall be marked with the ANSI luminaire code, "O".

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

Panel Meeting Action: Accept in Principle

Add new 410.73(F)(5) to read as follows:

(5) Metal Halide Lamp Containment. Luminaires (fixtures) that use a metal halide lamp other than a thick-glass parabolic reflector lamp (PAR) shall be provided with a containment barrier that encloses the lamp, or shall be provided with a physical means that only allows the use of a lamp that is Type "O."

FPN: See ANSI Standard C78.387, American National Standard for Electric Lamps—Metal Halide Lamps, Methods of Measuring Characteristics.

Panel Statement: The revisions made by the panel reflect the intent of the comment. The intent of the panel's revisions is to prompt a revision of the product standard that will mandate a physical means to prevent the insertion of any lamp other than ANSI-compliant Type "O" lamps into open luminaires.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-49 Log #2981 NEC-P18 **Final Action: Accept in Principle**
(410.73(F)(5))

Submitter: Steve Campolo, Leviton Manufacturing Co., Inc.

Comment on Proposal No: 18-91

Recommendation: Accept the revised wording of Mr. Rosenbaum, and make it clear the physical means could be incorporated in the lampholder.

Substantiation: By having the physical rejection means in the listed lampholder elimination of "easy" modifications to the luminaire is accomplished. By associating the lampholder to the lamp, a more foolproof method is achieved.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 18-48.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-50 Log #3428 NEC-P18 **Final Action: Accept in Principle**
(410.73(F)(5))

Submitter: James Hospodarsky, Lithonia Lighting

Comment on Proposal No: 18-91

Recommendation: Change proposed new 410.73(F)(5) as suggested by Mr. Rosenbaum to read:

(5) metal Halide Lamp Containment: Luminaires (fixtures) that use a metal halide lamp, other than a thick-glass parabolic reflector lamp (PAR), shall be provided with a containment barrier that encloses the lamp, or shall be provided with a physical means that only allows the use of a lamp that is containment rated by the lamp manufacturer for operation in an open luminaire (fixture). Lamps that are containment rated for use in an open luminaire shall be marked with the ANSI luminaire code, "O".

Substantiation: No substantiation has been given for requiring Listed lamps. No data has been given to support a claim that self-certification is inadequate for determining the suitability of an "O" rated lamp.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 18-48.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-51 Log #1036 NEC-P18 **Final Action: Reject**
(410.73(G) (New))

Submitter: Noel Williams, Noel Williams Consulting

Comment on Proposal No: 18-93

Recommendation: This proposal should be rejected.

Substantiation: The proposal is a design consideration. The NEC should not accommodate or condone unsafe practices. The supposed fact that changing ballasts on energized circuits has become a common practice is not a reason to impose a requirement on those who do not choose this unsafe practice. If a user wants to be able to replace luminaires without deenergizing the circuit, perhaps to avoid turning all the lights off, the disconnecting means mentioned in the exceptions are still available.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-52.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

O'BOYLE: See my explanation of negative vote on Comment 18-52.

ROSENBAUM: See my explanation of negative vote on Comment 18-52.

Comment on Affirmative:

COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-52 Log #20 NEC-P18 **Final Action: Accept in Principle in Part**
(410.79)

Submitter: Stanley J. Folz, Folz Electric, Inc.

Comment on Proposal No: 18-93

Recommendation: The proposed text should be modified as follows:

In other than dwellings and associated outbuildings, luminaires containing ballasts shall have ~~a~~ an integral disconnect switch to open all ~~ungrounded~~ current carrying ballast supply conductors.

Substantiation: It is known that working on energized equipment is not safe. It is also known that if a local disconnect is not available, ballasts will be serviced while energized. Also, most ballasts are serviced from a ladder, adding the increased injury from a fall. I have modified the wording to include "all" current carrying conductors. I think this addition is important with respect to multi-wire circuits. It is common practice to install a multi-wire circuit in long runs of fluorescent strip lights. If the grounded conductor in a multi-wire circuit is not disconnected at the same time as the ungrounded conductor, a false sense of security could result in an unexpected shock and its consequences.

Panel Meeting Action: Accept in Principle in Part

Revise panel action on 18-93 to read:

410.73(G) Disconnecting Means. In indoor locations, other than dwellings and associated accessory structures, fluorescent luminaires (fixtures) that utilize double-ended lamps and contain ballast(s) that can be serviced in place or ballasted luminaires that are supplied from multi-wire branch circuits and contain ballast(s) that can be serviced in place shall have a disconnecting means either internal or external to each luminaire (fixture), to disconnect simultaneously from the source of supply all conductors of the ballast, including the grounded conductor if any. The line side terminals of the disconnecting means shall be guarded. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast. This requirement shall become effective January 1, 2008

Exception No. 1: A disconnecting means shall not be required for luminaires (fixtures) installed in hazardous (classified) location(s).

Exception No. 2: A disconnecting means shall not be required for emergency illumination required in 700.16.

Exception No. 3: For cord-and-plug connected luminaires, an accessible separable connector or an accessible plug and receptacle shall be permitted to serve as the disconnecting means.
Exception No. 4 A disconnecting means shall not be required in industrial establishments with restricted public access where conditions of maintenance and supervision ensure that only qualified persons service the installation by written procedures.
Exception No. 5 Where more than one luminaire is installed and supplied by other than a multi-wire branch circuit, a disconnecting means shall not be required for every luminaire when the design of the installation includes locally accessible disconnects, such that the illuminated space cannot be left in total darkness.
Panel Statement: The panel has accepted the proposed replacement of the term "ungrounded" with "to disconnect simultaneously from the source of supply all conductors of the ballast". The panel does not accept the proposed additional requirement that the disconnecting means be an integral part of the luminaire (fixture). The panel has restricted the application to those luminaires and locations that have been identified as producing a hazard. The panel does not condone unsafe working practices but realizes the fact that they exist.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
O'BOYLE: I believe that the root issue is best addressed by safe work practice. However, if disconnecting means are to be required, I believe that provisions are needed to ensure that such disconnect may be included into the branch circuit design; allowing the disconnecting means to be either integral to, or separate from, the luminaire being controlled. The panel action language encumbers a design solution. As presently worded the ungrounded conductor is always required to simultaneously disconnect. This necessitates the use of a multiple pole disconnect does not allow typical branch circuit devices to be employed. This also limits component selection if the disconnect is integral to a luminaire. Since the need to disconnect the grounded conductor has not been supported by technical rational, this creates unnecessary complication in implementation. Also, there is not a clear reason to restrict exception 5 to "other than multi-wire branch circuits". Again, this creates unnecessary complication to implementing a design solution.
ROSENBAUM: NEMA fully supports the last sentence of the panel statement. NEMA does not condone unsafe working practices, but recognizes that they exist. Because of this, members of the panel developed the Panel Action in an attempt to enact a compromise that addressed what was believed to be those applications that are the most likely scenarios in which unsafe working practices would be used. However, after reviewing the outcome of this compromise, NEMA concludes that there are flaws in the wording that necessitate a negative vote.
The requirement to disconnect the grounded conductor on a multi-wire branch circuit has not been substantiated and is not necessary. Additionally, the requirement is flawed as it is applied to luminaires supplied by single-phase branch circuits. As written, it would be required to simultaneously disconnect both the current carrying and grounded conductor on a luminaire supplied by a single-phase, 120 volt circuit. This would prohibit the use of a simple switch that would be readily available, and force the use of a multiple pole disconnect for no justifiable reason.
NEMA also finds the following phrases to be vague and subject to varying interpretation:
- Exception No. 4: "…industrial establishments with restricted public access."
- Exception No. 5: "…locally accessible disconnects…".
WALL: The substantiation for this change is that electricians are getting hurt because they are not using safe work practices. Electricians can avoid injury by adopting safe work practices. They have the option of de-energizing the circuit or wearing the proper protective equipment. The panel was right to state that they do not condone unsafe work practices. Electricians should be encouraged to use safe work practices. It is costly to add a disconnect to every luminaire only because electricians won't follow known safe work practices. The change proposed would not alter the thousands of installations presently in place; therefore, electricians should know and use safe work practices.
Additionally, the new language requires the simultaneous disconnection of all the supply conductors, including the grounded conductor. The grounded conductor is only a hazard on multi-wire branch circuits. This puts an unnecessary requirement for a two-pole disconnect on those installations that are not multi-wire branch circuits.
Comment on Affirmative:
COSTELLO: This is a safety issue; with the acceptance of this change in the code, those persons that service and maintain luminaires will be provided with a means to eliminate a potential shock hazard.
The panel agrees with the submitter's substantiation that the grounded conductor of a miltiwire branch circuit does present a potential electrical shock hazard, and should be disconnected along with the ungrounded conductors.
Recognizing other comments from submitters, the panel has added exceptions limiting the scope of this provision.

18-53 Log #126 NEC-P18 **Final Action: Reject**
(410.79)

Submitter: David Shapiro, Safety First Electrical Contracting, Consulting, and Safety Education
Comment on Proposal No: 18-93
Recommendation: Accept in Principle, but with the initial phrase, "~~In other than...structures~~," removed.
Substantiation: Proper work practices say you don't work without suitable PPE, if you have to work live, but I'm glad the CMP did not dismiss this hazard on that basis. Well, non-dwelling work is more likely to be scrutinized by OSHA, and thus to hew more closely to proper work practices, than dwelling work. In my and many others' observation, dwelling repairs are more likely to be performed by the more ignorant, or at least by folks whose work practices are freewheeling. Thus, added protections are even more important there.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-52.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-54 Log #378 NEC-P18 **Final Action: Reject**
(410.79)

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 18-93
Recommendation: Reject proposal.
Substantiation: Persons servicing ballast type fixtures in other than "dwellings" are likely to be qualified. Is "dwellings" intended to apply to Dwelling Unit, Dwelling One Family, Dwelling Two Family, Dwelling Multifamily? The Proposal does not specifically require disconnecting means as part of the lumunaire. A wall switch or branch circuit disconnecting means is covered by "shall have a disconnecting means". Hotels, motels, and apartments may be presumed to be "dwellings" (not defined). The reasoning for Exceptions No. 1 and 2 are discernible but the same shock hazard exists; and one type of potential hazard seems to be weighed against another. "Accessible to qualified persons" is meaningless as it doesn't proscribe or restrict access to unqualified persons. If a lock or tool is intended, what kind? Who is to possess it? The proposal is broad enough to cover exterior fixtures, pole mounted fixtures, etc., which may be serviced during daylight hours. The substantiation logic could be applied to require a Code rule for all utilization equipment to contain a disconnecting means. Many proposals have been rejected on the basis of being unnecessary if proper safety practices are employed by qualified persons.
Panel Meeting Action: Reject
Panel Statement: Article 100 contains the definition of "dwelling unit." See also comments on Comment 18-52.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-52.
ROSENBAUM: See my explanation of negative vote on Comment 18-52.
Comment on Affirmative:
COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-55 Log #1367 NEC-P18 **Final Action: Reject**
(410.79)

Submitter: James Hospodarsky, Lithonia Lighting
Comment on Proposal No: 18-93
Recommendation: The original proposal to change 410.79 and the panel action to add a new section 410.73(G) should be rejected.
Substantiation: This proposal provides no substantiation showing that the existing code is inadequate when luminaires are maintained in accordance with safe working practices such as turning off the power or using the appropriate personal protective equipment. Luminaires with these disconnect means are currently readily available and may be used in areas that were identified by the submitter as having to be worked "hot" because the circuit could not be turned off. Concerning unmarked or mismarked circuits, this is a workmanship issue which should be addressed elsewhere as this is an unsafe condition regardless of the circuit use. The code should not require the addition of costly product modifications to all ballasted luminaires to accommodate unsafe maintenance practices particularly when the ability to supply liminaires of this type already exists to address those instances where this type of construction is needed.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-52.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-52.
ROSENBAUM: See my explanation of negative vote on Comment 18-52.
Comment on Affirmative:
COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-56 Log #1962 NEC-P18 **Final Action: Accept in Principle**
(410.79)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 18-93
Recommendation: The Panel should continue to accept this proposal in principle.
Substantiation: It is unfortunate that the final support for this proposal just fell short of the necessary two-thirds for passage. This really was an aggressive move to be pro-active in an area that needs to be drastically changed. The sad fact of the matter is that each time an electrician ventures into the field, there is pressure to work lighting circuits in an energized condition. The pressure typically comes from the owner and the contractor who wants to comply with the owner's request not to inconvenience the office personnel who may be working in the area. This proposal provides an engineering solution to a common problem that threatens and takes the lives of electricians each day. IBEW data indicates that 277-volt lighting circuits are the biggest killer. Addressing this from the equipment point of view will help to solve the problem. Hopefully, Panel 18 has opened the door to full consideration of this important electrical safety issue that is one of the most significant safety issues that the industry currently faces. 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 Comment 18-52.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-52.
ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**
COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-57 Log #1963 NEC-P18 **Final Action: Accept in Principle**
(410.79)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 18-92
Recommendation: The Panel should continue to accept this proposal in principle in part.
Substantiation: It is unfortunate that the final support for this proposal just fell short of the necessary two-thirds for passage. This really was an aggressive move to be pro-active in an area that needs to be drastically changed. The sad fact of the matter is that each time an electrician ventures into the field, there is pressure to work lighting circuits in an energized condition. The pressure typically comes from the owner and the contractor who wants to comply with the owner's request not to inconvenience the office personnel who may be working in the area. This proposal provides an engineering solution to a common problem that threatens and takes the lives of electricians each day. IBEW data indicates that 277-volt lighting circuits are the biggest killer. Addressing this from the equipment point of view will help to solve the problem. Hopefully, Panel 18 has opened the door to full consideration of this important electrical safety issue that is one of the most significant safety issues that the industry currently faces. 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 Comment 18-52.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-52.
ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**
COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-58 Log #2178 NEC-P18 **Final Action: Accept in Principle**
(410.79)

Submitter: Danny Liggett Richmond, TX
Comment on Proposal No: 18-93
Recommendation: This proposal should have been accepted in principle with the changes proposed by the panel.
Substantiation: I am disheartened by action of the panel and the comments in the "explanation of negative." These only further the opinion that changing out a ballast while energized is an acceptable industry practice. This will lead to further incidents, injuries and fatalities. The idea for this concept came from what I had seen in Europe. They found a way to get it done. I doubt seriously that addition of a disconnecting means would add significantly to the cost of the luminaries. In root cause failure analysis and in failure effect mode analysis both come to the same conclusion. Addition of the disconnecting means gets at the root cause of the problem. Regardless of how many regulations we have in place and how much we talk about work practices as long as there is the perception it is considered as an acceptable industry practice things will not change. My office is currently in an engineering office building that my company does not own. The maintenance is contracted and is done under the direction of the building owner. In September of this year, in my own office a worker tried to change a ballast out while energized. I stopped him. I asked him why. He said he could not turn the circuit off because it would disrupt the workers in the area. I made him turn off the circuit. Had there been a disconnecting means on the luminaries this would not be an issue. The NEC should be driving toward installations where safe work practices are not needed to eliminate hazards. Inherently safer designs of equipment are needed. It starts with the NEC requiring them.
Panel Meeting Action: Accept in Principle
Panel Statement: See the panel action and statement on Comment 18-52.
The panel takes exception to some of the submitter's substantiation as follows. The panel does not agree that the panel's "explanation of negative" comments furthers the opinion that changing out a ballast while energized is an acceptable industry practice. Rather, these comments stress the need for applying safe work practices. No root cause failure analysis or failure effect mode analysis has been provided to support the conclusion that the lack of a disconnect means is the root cause of a problem. The panel does not agree with the statement that the NEC should be driving toward installations where safe work practices are not needed. The panel applauds the submitter for stopping the potential unsafe work practice that he described in his office.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-52.
ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**
COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-59 Log #2869 NEC-P18 **Final Action: Reject**
(410.79)

Submitter: Joseph J. Guarino, Cooper Lighting
Comment on Proposal No: 18-93
Recommendation: Support rejection of original Proposal 18-93.
Substantiation: This proposal is due in part, to address unsafe working practices in the field. The use of personal protective equipment will prevent most injuries, when it is necessary to work on energized equipment. Safe work practice should always be followed, regardless of the equipment being serviced.
Panel Meeting Action: Reject
Panel Statement: See the panel action and statement on Comment 18-52.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
O'BOYLE: See my explanation of negative vote on Comment 18-52.
ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**
COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-60 Log #3274 NEC-P18 **Final Action: Reject**
(410.79)

Submitter: Reed Bradford, General Electric Lighting Systems, Inc.
Comment on Proposal No: 18-93
Recommendation: It is the position of General Electric Lighting Systems that the proposal 18-93 requiring a disconnect switch to all ungrounded ballast conductors is not warranted and recommends that the Panel reject this proposal. Specifically, the additional wording in 410.79 "In other than dwellings and associated outbuildings, luminaires containing ballasts shall have a disconnect switch to open all ungrounded ballast supply conductors" should be deleted.
Substantiation: We feel the industry has provided means of designing lighting applications that can provide a means of disconnects via "cord and plug" connections, modular wiring or other such devices. The building electrical design engineer should gather the specific needs of the application prior to specifying lighting and electrical equipment. It is the responsibility of the designer to be aware of and allow for maintenance operation in conjunction with the normal operation of the facility.
Currently, there exists several ways of accomplishing the maintenance work necessary without the expensive and widespread use of disconnect switches in luminaires. The suggested solution provides an industry-wide remedy for an unsafe work practice that only exists for a small fraction of the lighting applications. Such a change to the code would require all luminaires to be manufactured with disconnects since it in not always possible to know the intended applications.
Additionally, the substantiation does not provide any supporting data documenting injury or death when following proper work rules. Current OSHA work rules state the power must be disconnected to the luminaires prior to servicing. Work should not commence on a luminaire until it has been confirmed

that the power has been disconnected. If this is not practical, work can be performed on energized luminaires provided the electrician is using proper personal protection equipment. We believe this resolves all the issues outlined in the substantiation such as dark work areas, interruption to commercial activity and improper marking of circuit.

Luminaires intended for these applications have been designed to the safety standards outlined by third party certification organizations such as Underwriters Laboratories. The design allows for "normal" maintenance such as replacing lamps to be accomplished while energized but these standards are based on the fact that qualified personnel following accepted work practices perform maintenance beyond "normal". This would include the replacement of ballasts, fusing, capacitors, igniters, etc. A "perceived" shift in the acceptable practice is an issue of enforcement of current work rules and should not be shifted onto the design and manufacture of commercial luminaires.

GE Lighting Systems supports the methods of increasing the safety of in product design, application and industry practice. Again, we recommend the panel reject Proposal 18-93 for the reasons state above.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-52.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

O'BOYLE: See my explanation of negative vote on Comment 18-52.

ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**

COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-61 Log #3327 NEC-P18 **Final Action: Accept in Principle**
(410.79)

Submitter: Pekka Hakkarainen, Lutron Electronics Co. Inc

Comment on Proposal No: 18-93

Recommendation: Accept proposal 18-93 as modified by the panel with the following additional exceptions:

"Exception No. 4: Where more than one luminaire is installed, a disconnecting means shall not be required in every luminaire when the design of the installationj includes sufficient locally accessible disconnects such that the illuminated space cannot be left in total darkness.

Exception No. 5: Where only one luminaire is installed, a disconnecting means shall not be required in the luminaire when the installation includes a locally accessible disconnect."

Substantiation: The additional exceptions address those installations (perhaps the majority of installations) where groups of luminaires can be switched off without disturbing the occupants or leaving the space in total darkness. This exception would eliminate the unwarranted cost burden associated with installing individual disconnect-equipped luminaires where they are not necessary to eliminate the hazards described by the submitter associated with maintenance and servicing of luminaires containing ballasts.

The additional exceptions are also in agreement, in principle, with all the major energy codes (such as ASHRAE 90.1-2001, California Title 24) which require illuminated spaces to be divided into smaller areas using separate switching devices, and often also require bilevel switching in smaller spaces, such as small offices.

In addition, since the modified proposal retains the requirement for disconnect-equipped luminaires, it allows for commercial establishments to install individual disconnect-equipped luminaires where they do not want the customer base to be unduly disturbed by the maintenance and servicing of luminaires containing ballasts.

Panel Meeting Action: Accept in Principle

Panel Statement: See the panel action and statement on Comment 18-52.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

O'BOYLE: See my explanation of negative vote on Comment 18-52.

ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**

COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

18-62 Log #3425 NEC-P18 **Final Action: Reject**
(410.79)

Submitter: John D. Green, Holophane, an Acuity Brands Company

Comment on Proposal No: 18-92

Recommendation: Uphold the panel rejection of the changes outlined in 410-79 by not implementing proposed text additions. Delete the added requirements of -79 as proposed in Proposal 18-92 and 18-93.

Substantiation: This code change will require manufacturers to add parts and wiring for each luminaire, as well as revise tooling, resubmit for agency safety listing and republish literature for most of their products. The resulting increase in end-user cost for the product is unwarranted since adequate measures are already in place to prevent unsafe maintenance of luminaires. Proper work practices are already known in the industry and apply to all electrical equipment, including use of circuit lockout devices and appropriate personal protection equipment. Improper adherence to one set of safety requirements should not spawn the generation of another set of cost-intensive attempts to compensate for the lack of respect for safe conduct. Proper design of the electrical distribution system can meet the customer's need for new and retrofitted installations so servicing of lighting equipment is not disruptive. In addition, if the proposed requirement is not retroactive and not applied to equipment already installed, there would be no effect on the maintenance of existing installations. Both proposals also attempt to limit the scope to non-dwellings, but in practice, luminaire manufacturers do not know where a product will ultimately be applied, so all products would need to be listed for commercial/industrial spaces and include the disconnect, negating the exemption.

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-52.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 9 Negative: 2

Explanation of Negative:

O'BOYLE: See my explanation of negative vote on Comment 18-52.

ROSENBAUM: See my explanation of negative vote on Comment 18-52.**Comment on Affirmative:**

COSTELLO: See my Explanation of Affirmative Vote on Comment 18-52.

ARTICLE 411 — LIGHTING SYSTEMS OPERATING AT 30 VOLTS OR LESS

18-63 Log #1037 NEC-P18 **Final Action: Reject**
(411.4)

Submitter: Noel Williams, Noel Williams Consulting

Comment on Proposal No: 18-98

Recommendation: This proposal should remain accepted in principle as modified by panel action.

Substantiation: The rewritten rule is clearer and avoids the use of an exception. The need for listing of a Class 2 power supply is also very important. Most low voltage lighting systems are not Class 2, even though they are "Low voltage." Class 2 systems are incapable of supplying very much lighting. It should be noted that this rule is not really necessary and the submitters statement is incorrect. A Class 2 system need not be recognized by Article 411 or listed as "low voltage lighting" because Article 725 may modify Chapter 4 and Class 2 systems are not limited to remote-control and signaling by Article 725. Class 2 circuits are not defined by use, they are defined by their power supply. (725.2 and 725.41.)

Panel Meeting Action: Reject

Panel Statement: See the panel action and statement on Comment 18-64.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-64 Log #3516 NEC-P18 **Final Action: Accept in Principle**
(411.4)

Submitter: Henry A. Jenkins, Wake County, Inspections Development

Comment on Proposal No: 18-101

Recommendation: Revise the wording of 411.4 to read:

411.4 Locations Not Permitted. Lighting systems operating at 30 volts or less shall not be installed in the locations described in 411.4(A) and (B).

(A) Where concealed or extended through a building wall unless permitted in (1) or (2).

(1) Installations .... using any of the wiring methods specified in Chapter 3.

(2) Installations... using wiring supplied by a listed Class 2 power source and installed in accordance with 725.52.

(B) Where installed within 3.0 m (10 ft) of pools, spas, fountains, or similar locations, unless permitted by Article 680.

Substantiation: Delete the word "performed with" in both (1) and (2) since these installations are not being performed in the field, they are actually being installed using wiring methods for general wiring or wiring methods for Class 2 systems in accordance with Part III of Article 725.

Panel Meeting Action: Accept in Principle

Revise the wording of 411.4 to read:

411.4 Locations Not Permitted. Lighting systems operating at 30 volts or less shall not be installed in the locations described in 411.4(A) and (B).

(A) Where concealed or extended through a building wall unless permitted in (1) or (2).

(1) Installed using any of the wiring methods specified in Chapter 3.

(2) Installed using wiring supplied by a listed Class 2 power source and installed in accordance with 725.52.

(B) Where installed within 3.0 m (10 ft) of pools, spas, fountains, or similar locations, unless permitted by Article 680.

Panel Statement: CMP 18 concludes that the change from "installations performed with" to "installed using" is in keeping with the usability of the Code.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

18-65 Log #1038 NEC-P18 **Final Action: Accept**
(411.5(C))

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 18-102
Recommendation: This proposal should be accepted in principal as modified by the panel meeting action.
Substantiation: The appropriate use of bare conductors needs clarification, but the panel action did not adopt the change they proposed.
Panel Meeting Action: Accept
Revise wording of 411.5(C) to read as follows to clarify that bare conductors may only be used indoors:
(C) Bare Conductors. Exposed bare conductors and current-carrying parts shall be permitted for indoor installations only. Bare conductors shall not be installed less than 2.1 m (7 ft) above the finished floor, unless specifically listed for a lower installation height.
Panel Statement: The panel agrees that the proposal was incorrectly marked as reject and should have been accept in principle.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

18-66 Log #1858 NEC-P18 **Final Action: Accept**
(411.5(C))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 18-102
Recommendation: Accept the proposal in principle using the panel text in the ROP.
Substantiation: It appears that the panel action to reject was in error and was actually to accept in principle. The panel text is appropriate.
Panel Meeting Action: Accept
Panel Statement: See the panel action and statement on Comment 18-65.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

ARTICLE 422 — APPLIANCES

17-3 Log #1864 NEC-P17 **Final Action: Accept in Principle in Part**
(422(53))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-6
Recommendation: Accept the proposal in principle. Relocate the requirement to Part IV and include an effective date, as follows:
422.53 Cord- and Plug-Connected Vending Machines. Cord- and plug-connected vending machines manufactured or remanufactured on or after January 1, 2005 shall include GFCI for personnel as an integral part of the attachment plug or located in the power supply cord within 300 mm (12 in.) of the attachment plug, or they shall be listed and incorporate a system of double insulation. Cord- and plug-connected vending machines using a system of double insulation shall be clearly marked to indicate this system is in use. Cord-and-plug connected vending machines manufactured or remanufactured before January 1, 2005 that are not double insulated or that do not incorporate GFCI protection shall be connected to an outlet protected by a ground-fault circuit-interrupter.
Substantiation: This requirement belongs in Part IV, as originally proposed. It is squarely directed to the vending machine industry during the appliance manufacturing process. The GFCI permission for the outlet is a transition rule that can follow the principal requirement. Note that the GFCI rule should apply to the outlet and not the branch circuit. There was no substantiation to support the argument that only a GFCI circuit breaker could be used because the entire circuit needed to be protected, only the appliance.
Panel Meeting Action: Accept in Principle in Part
Change the comment recommendation adding a new Section 422.51 to read as follows:
422.51 Cord-and-Plug-Connected Vending Machines.
Cord-and-plug-connected vending machines manufactured or re-manufactured on or after January 1, 2005 shall include a ground-fault circuit-interrupter as an integral part of the attachment plug or located in the power supply cord within 300 mm (12 in.) of the attachment plug. Cord-and-plug-connected vending machines not incorporating integral GFCI protection shall be connected to a GFCI protected outlet.
Panel Statement: The requirement for double insulation is deleted, since the panel agrees with the substantiation on Comments 17-47 and 17-50.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 9 Negative: 2
Explanation of Negative:
CRIPPS: It continues to be my position that the application of a safety device as an integral part of an appliance is an issue for the safety standard specifically covering that appliance, and is not the responsibility of the National Electrical Code.
HIRSCH: It is the Edison Electric Institute's position that the requirements for end-use electrical devices that are not installed as part of the permanent premises wiring system are best covered by appropriate products standards. It is not the National Electrical Code's intent or scope to set requirements for end-use electrical devices that would typically be purchased by the after market consumer.
The Edison Electric Institute supports the entire electrical safety system that integrates product standards, installation standards, product testing and evaluation, electrical inspection, manufacturer's products, qualified electrical installation and maintenance, electric supply system characteristics, and the owner's use and operation. Covering product standards in the National Electrical Code installation standard could negate the responsibility of the appropriate product standard and adversely impact the entire process.
The integrity of the electrical safety system is anchored in the systematic integration of the National Electrical Code, installation inspection, product safety standards and product testing. If non-premises end-use product safety issues are usurped by the National Electrical Code, the product safety standard process will be weakened resulting in the entire process being weakened. In addition, since non-premises end-use products are not normally in place during the inspection process, enforcement of such a requirement under the NEC would be impossible.
The Panel also removed the acceptability of double insulation as an alternative to GFCI protection from the original proposal without sufficient substantiation and without addressing the issue of the spoilage of perishable foods sold in refrigerated vending machines.
Comment on Affirmative:
HUTCHINGS: I concur with the panel action except the date by which vending machines need to incorporate an integral GFCI as required by new 422.51 should be changed from January 1, 2005 to January 1, 2006 or later. The 2005 NEC will not be published until late in 2004. Most manufacturers of vending machines will not be aware of the new requirement nor have time to make changes to their production by January 2005. Changing the date to 2006 will give manufacturers time to become aware of the requirement, obtain ample supplies of GFCIs, and begin incorporating the GFCIs into their production.

17-4 Log #2982 NEC-P17 **Final Action: Reject**
(422.2, 422.16 (B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-4 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
The Technical Correlating Committee understands that it is not necessary to move the definition of LCDI to Article 100 since the Comment was Rejected, and LCDI is only in one Article.
Submitter: Steve Campolo, Leviton Manufacturing Co., Inc.
Comment on Proposal No: 17-7
Recommendation: Accept original proposal.
Substantiation: See comment on 17-22. Also, it it noted that Mr. Koessel changed his vote. The reason stated for the vote change is inconsistent with many other panel actions. Perhaps the volume of listing investigations on a variety of products may have had an influence.
Panel Meeting Action: Accept in Principle in Part
In the proposal editorially revise the second section in 422.16(B) (4) to 422.52 and change the title to read as follows: 422.52 Room Air Heaters.
Relocate the proposed definition for LCDI to Article 100.
Panel Statement: This requirement belongs in Part IV Construction. The first part of the proposal, 422.2, is referred to CMP 1 for inclusion of the definition in Article 100. The definition is also in 440.2.
It is recommended that the TCC correlate the relocation of the definition of LCDI to Article 100, removing it from Section 440.2.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 6 Negative: 5
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: 1. Addition of an AFCI or LCDI to the cord of a cord-connected electric heater or electric fan may reduce the reliability of the appliance, and increase the risk to the consumers. For example, failure of a cord-connected AFCI or LCDI on an electric fan or electric heater could result in replacement of the appliance cord and/or plug by the consumer, which could result in an unsafe condition (e.g., two-prong non-grounding type receptacle, cord with insufficient ampacity, loose terminations, or mechanically weak terminations).
2. Code Making Panel 2 has voted not to extend the use of AFCI circuit breakers past the bedroom circuits for the 2005 NEC. These AFCI circuit breakers were first required by the 2002 NEC. There is not enough data to conclusively support the effectiveness of the AFCI circuit breakers (i.e., AFCI technology) in preventing fires.
HIRSCH: It is the Edison Electric Institute's position that the requirements for end-use electrical devices that are not installed as part of the permanent premises wiring system are best covered by appropriate product standards. It is not the National Electrical Code's intent or scope to set requirements for end-use electrical devices that would typically be purchased by the after market consumer.
The Edison Electric Institute supports the entire electrical safety system that integrates product standards, installation standards, product testing and evaluation, electrical inspection, manufacturer's products, qualified electrical installation and maintenance, electric supply system characteristics, and the owner's use and operation. Covering product standards in the National Electrical Code installation standard could negate the responsibility of the appropriate product standard and adversely impact the entire process.
The integrity of the electrical safety system is anchored in the systematic integration of the National Electrical Code, installation inspection, product

safety standards and product testing. If non-premises end-use product safety issues are usurped by the National Electrical Code, the product safety standard process will be weakened resulting in the entire process being weakened. In addition, since non-premises end-use products are not normally in place during the inspection process, enforcement of such a requirement under the NEC would be impossible.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: The proposed requirements for cord-mounted AFCIs, ALCIs or LCDIs on portable electric fans, and portable heaters and other cord-connected appliances. These product requirements belong in the product standards, not in the installation documents such as the NEC. This would also be a problem to enforce. I also feel that insufficient evidence to warrant these devices and further substantiation is required.

Comment on Affirmative:

YASENCHAK: These type devices have been in service and a requirement of 210.12 of the 1999 Code for bedroom circuits since 1/1/2002. No proof has been brought forth that these devices do not perform the function intended, nor has there been documented occurrences of failures. The cost involved in installing these devices is slight, as verified through presentations to the committee in San Diego, and should not be considered a hindrance for installation. The saving of lives, when installing these devices on cord-connnected appliances, is a worthwhile undertaking and should be enforced. This new technology is receiving the same resistance as GFCI protection received when first introduced, but since then, GFCI has proven to save lives and property, as required in Article 90 of this Code. These devices will also meet the intent of 90.1.

17-5 Log #3477 NEC-P17 **Final Action: Reject**
(422.2, 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-5 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Bruce Schmidt, The Metal Ware Corp.

Comment on Proposal No: 17-22

Recommendation: I oppose the adoption of this proposal in any form.

Substantiation: My opposition to this proposal is based on the following:

1) According to qualified studies, these devices do not respond to glowing connections (high resistance) inside plugs, power strips or receptacles. This is very common fault that AFCI and LCDI devices cannot detect and the American consumer could be led to a false sense of security.

2) The proposed cord-mounted devices necessitate a bulky device that will reduce a duplex outlet into a single outlet. This will encourage the appliance owner to use multi-way adapters, power strips, and/or other undesirable methods, to gain more outlet space. Also, these bulky devices will place extra strain on the outlets, leading to excessive wear and distortion of the internal contacts and increase the contact resistance. In the long term, this could lead to an increase in receptacle fires.

3) Those promoting LCDI and AFCI devices will make appliances suitable for use in wet conditions. This has been proven false by an independent technical investigation and this would lead to a false sense of security.

Supporting documentation for the above items will be presented at the Code Making Panel #17 at the December, 2003 Report on Comments meeting.

Panel Meeting Action: Reject

Panel Statement: The panel disagrees with the second statement; the device does not limit the number of appliances that could be connected to a duplex receptacle to a single receptacle

The purpose of AFCI and LDCI is not to protect against high resistance connections.

The substantiation is not adequate.

The purpose of AFCI and LDCI is not to serve as a GFCI.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 6 Negative: 5

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.**Comment on Affirmative:**

YASENCHAK: These type devices have been in service and a requirement of 210.12 of the 1999 Code for bedroom circuits since 1/1/2002. No proof has been brought forth that these devices do not perform the function intended, nor has there been documented occurences of failures. The cost involved in installing these devices is slight, as verified through presentations to the committee in San Diego, and should not be considered a hindrance for installation. The saving of lives, when installing these devices on cord-connected appliances, is a worthwhile undertaking and should be enforced. This new technology is receiving the same resistance as GFCI protection received when first introduced, but since then, GFCI has proven to save lives and property, as required in Article 90 of this Code. These devices will also meet the intent of 90.1.

17-6 Log #3478 NEC-P17 **Final Action: Reject**
(422.2, 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-6 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Bruce Schmidt, The Metal Ware Corp.

Comment on Proposal No: 17-7

Recommendation: I oppose the adoption of this proposal in any form.

Substantiation: My opposition to this proposal is based on the following:

1) According to qualified studies, these devices do not respond to glowing connections (high resistance) inside plugs, power strips or receptacles. This is very common fault that AFCI and LCDI devices cannot detect and the American consumer could be led to a false sense of security.

2) The proposed cord-mounted devices necessitate a bulky device that will reduce a duplex outlet into a single outlet. This will encourage the appliance owner to use multi-way adapters, power strips, and/or other undesirable methods, to gain more outlet space. Also, these bulky devices will place extra strain on the outlets, leading to excessive wear and distortion of the internal contacts and increase the contact resistance. In the long term, this could lead to an increase in receptacle fires.

3) Those promoting LCDI and AFCI devices will make appliances suitable for use in wet conditions. This has been proven false by an independent technical investigation and this would lead to a false sense of security.

Supporting documentation for the above items will be presented at the Code Making Panel #17 at the December, 2003 Report on Comments meeting.

Panel Meeting Action: Reject

Panel Statement: The purpose of AFCI and LDCI is not to protect against high resistance connections. The panel disagrees with the second statement; the device does not limit the number of appliances that could be connected to a duplex receptacle to a single receptacle. No substantiation is given for immersion requirement.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: The original proposal basis was from incident reports data provided to the panel showing supply cords as the ignition source in many of the cases. Cases involving room air conditioners where the cord was purported to be the source is significantly low and the cords in the cases were modified in some manner or spliced by the user against recommendations of the manufacturer. LCDI/AFCI cord mounted devices would not prevent the effects related to these modifications or alterations of the cords.

Adoption of the proposal to add LCDI/AFCI is directly affecting the design of products produced and although it is the intent of the panel to provide protection to the public it is not the place of the panel to determine design development of appliances. Adopting this proposal would utilize the panel as a vehicle for design of products.**Comment on Affirmative:**

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-7 Log #2027 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-7 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Christian Prestat, Groupe SEB

Comment on Proposal No: 17-7

Recommendation: We do not support this proposal as submitted.

Substantiation: 1) We agree to increase the safety of appliance such as heaters and fans but in this case, we are not sure that conformity of products to the new proposal solve all problems of cord failures.

An important parameter is to keep these cords which are sometimes frequently plugged, unplugged and rolled around the product in a good condition of use.

2) Both AFCIs and LCDIs devices involve electronic control system and failure could occur in these devices due to electromagnetic phenomena (wide use of mobile phone, high frequency transmitting systems and electronic appliance controls).

Panel Meeting Action: Reject

Panel Statement: The purpose of the devices is not to protect cords in good condition. No substantiation is provided.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my explanation of negative vote on Comment 17-6.**Comment on Affirmative:**

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-8 Log #2928 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-8 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Simon Andras, Euro-Pro Inc.
Comment on Proposal No: 17-7
Recommendation: I oppose the adoption of this proposal in any form.
Substantiation: Further development is neccessary for reliable AFCI and LCDI operation.
Panel Meeting Action: Reject
Panel Statement: No substantiation is provided that these devices are unreliable.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-9 Log #2932 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-9 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Victor Smith, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: I oppose it.
Substantiation: If we implement this new proposal, what guarantee that it will make a significant change, and if not much, where does it end. Some point in time the responsibility has to lie on the consumer, rather than the manufacturer, and the time is now.
Panel Meeting Action: Reject
Panel Statement: No substantiation is provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-10 Log #2935 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-10 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Eric Wall, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: Oppose new standard.
Substantiation: - Will not improve on the utilization of extension cords with the products. Extension cords would defeat the purpose of using LCDI or AFCI protection.
- Cost increase would be absorbed solely by manufacturers. This would be due to all products having LCDI or AFCI protection, which provides no product distinction between products in the market place.
Panel Meeting Action: Reject
Panel Statement: The devices are not intended as protection for extension cords. Cost is not a consideration for safety in the Code making process.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-11 Log #2936 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-11 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Ralph Hudnall, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: I oppose the proposal in its entirety.
Substantiation: I doubt the claims made that LCDI and AFCI devices will prevent the situations addressed by this proposal. Further I feel these devices will give the consumer a false sense of security and could lead to more problems in the field.
Panel Meeting Action: Reject
Panel Statement: No substantiation is provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-12 Log #2939 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-12 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: James Pierce, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: I do not agree with it.
Substantiation: False sense of security for the consumer.
Panel Meeting Action: Reject
Panel Statement: No substantiation is provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-13 Log #2940 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-13 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Mason Greene, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: I disagree with the proposed changes to 422.2 and 422.16(B)(4).
Substantiation: None submitted.
Panel Meeting Action: Reject
Panel Statement: No substantiation is provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-14 Log #2946 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-14 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Chad Reese, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: Do not implement next text.
Substantiation: This type of change complicates the product for the consumer and makes them likely to attempt modification to the product causing additional danger. This change should be implemented for new building construction so it effects anything down stream of the outlet.
Panel Meeting Action: Reject

Panel Statement: No substantiation is provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6
.**Comment on Affirmative:**
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-15 Log #2993 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-15 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Richard J. Cripps, Association of Home Appliance Manufacturers
Comment on Proposal No: 17-7
Recommendation: We oppose the adoption of this proposal in any form.
Substantiation: Our opposition to this proposal is based on the following:
1. The proponents of 2005 NEC proposals 17-7 and 17-22 have used as substantiation that purported numbers of fires associated with fans and heaters. The Association of Home Appliance Manufacturers contracted with a highly regarded statistical review firm, Heiden Associates to determine if the statistics cited were accurate. The report of Heiden Associates on this subject will be presented at the December NEC CMP 17 meeting. However, the executive summary of the October xx, 2003 Heiden Associates report states, "Our analysis shows that the proponents have drastically overstated the prevalence of unit cord and plug fires, which account for no more than a few percent of the total number of incidents involving these types of appliances. In addition, several of the statistics included in the proposal substantiation are flatly contradicted by the very sources the NEC -17-7 and NEC 17-22 proponents cite in support of their claims. This report demonstrates that if these errors and misstatements are corrected and more reliable techniques are used to investigate the fire hazard profiles associated with this equipment, adopting these proposals will have at best a very minimal impact on the number of fires involving portable electric heaters and fans".
2. The proponents of code proposals 17-7 and 17-22 have misrepresented the facts regarding the risks involved and the subsequent societal impact of requiring devices such as cord-connected AFCIs or LCDIs on fans and heaters. The proponent of the heater proposal, Mr. Schiff, has presented 91 reports of supposedly fires involving heaters with cord sets. The inference is that all of these would have been alleviated by the use of an LCDI or AFCI. However, in the September 10, 2003 UL report and in the October 2003 Heiden & Associates report, after careful scrutiny, only a few percent might possibly have been affected by a cord-connected AFCI or LCDI. And, based on the incompleteness of fire investigation reports, it is impossible to know from these whether such a device would have any effect. Waving dozens of fire reports is not a way for the code panel to make decisions on such an important issue.
Panel Meeting Action: Reject
Panel Statement: The UL provided data conflicts with the first statement. The panel does not agree that the facts were misrepresented. The "data" cited in the substantiation is not quantified (e.g., only a few percent).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: A very large number of comments were submitted both for and against proposals 17-7 and 17-22, and each covered one or more very important issues connected with the use of AFCI/LCDI protection integrally with appliance power supply cords. The following paragraphs should be read as expressing all my principal concerns over the mandatory application of these devices to the power supply cords of fans and room air heaters.
In view of the many incompatible opinions which have been expressed during the Panel debate, I strongly support the recommendation by CMP #17 member Mr. Hutchings that the Panel Chairman appoint a study group to examine exhaustively the whole issue of the need for and merits of integral power supply cord protection and report back for the next Code cycle.
I vote Negative on the panel action on the following grounds:
1) The language of the proposals is flawed. Both specify the use of two alternative protective techniques which have different operating characteristics and guard against different faults. How are manufacturers to make logical decisions on which to use?
2) The proponents have failed to substantiate that there is a problem of sufficient magnitude to justify the original proposals. Statements that fans and room air heaters "are a leading cause of residential fires" are not born out by independent statistical analysis. In addition, the independent statistical analysis "...demonstrates that if these errors and misstatements are corrected and more reliable techniques are used to investigate the fire hazard profiles associated with this equipment, adopting these proposals will have at best a very minimal impact on the number of fires involving portable electric heaters and fans."
3) Neither protective devices will protect against ignitions initiations by upstream faults such as the use of inappropriate extension cords or defective receptacles, which are the true cause of many fires claimed to have originated in appliances.
4) The panel statement on comment 17-6 dismisses the criticism that it is not possible to connect two protective devices into a duplex receptacle, thereby leading to an undesirable need to increase the use of unprotected power strips to compensate. A two-conductor 12A LCDI is 3 in. long with polarized blades. How, therefore, can two be plugged into a duplex outlet? the only way that two cords can be connected is if one has a standard plug and is inserted above the LCDI, putting the unprotected cord in the more exposed situation.
5) The experience of manufacturers who have worked with these devices to date suggests that they are not yet sufficiently developed from a reliability point of view to allow them to form the basis of mandatory requirements.
6) The panel statement on comment 17-19 includes the sentence "The purpose of AFCI and LCDI is not to protect against electrocutions." Yet the proponents of proposal 17-7 has repeatedly claimed that the LCDI device will do just that, a) in their own sales literature and on product packaging, b) in a presentation to CMP 11 in December 2000 and c) in a presentation to CMP 17 in January 2003. In the latter presentation, the proponents specifically asserted that adding LCDI protection to a room air heater made it suitable for use in a bathroom or other damp location. Independent technical analysis of the LCDI principle found no substantiation for such a claim. consumers will be mislead into using their products under dangerous conditions.
7) The issue of integral supply cord protection is one which should be addressed by the writers of the product standards. The National Electrical Code is not the appropriate vehicle for mandating safety provisions on products which are not permanently connected to the supply. The fact that Code provisions have been applied to other appliances in the past is not an automaticc argument in favor of every subsequent proposal.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-16 Log #3036 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-16 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: John N. Balough, The Hoover Company
Comment on Proposal No: 17-7
Recommendation: Please Reject Proposal.
Substantiation: Neither AFCI nor LCDI triggers to high resistance. Proposal gives choice of either AFCI or LCDI it should be specific - instructions based on product, how to select needed.
Current AFCI and LCDI designs are prone to nusiance tripping could and will lead to removal or bypass by the consumer.
Panel Meeting Action: Reject
Panel Statement: The purpose of AFCI and LDCI is not to protect against high resistance connections.
No substantiation is provided for second paragraph.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-17 Log #3037 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-17 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Donna Hummell, The Hoover Company
Comment on Proposal No: 17-7
Recommendation: Please Reject Proposal.
Substantiation: There is no technical justification for proposal.
Panel Meeting Action: Reject
Panel Statement: No substantiation is provided for the second paragraph.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-18 Log #3265 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-18 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Joseph M. McGuire, Assoc. Home Appliance Manufacturers
Comment on Proposal No: 17-7
Recommendation: I do not support this proposal. We oppose the adoption of this proposal in any form.
Substantiation: Our opposition to this proposal is based on the following:
In April 2003 the US Consumer Product Safety Commission released a study of the economic analysis of replacing standard circuit breakers in houses with special AFCI circuit breakers. The study notes that there are an average of 41,500 residential fires involving electrical distribution systems over the last 9 years, with 326 deaths, 1,481 injuries, and 646 million in property loss. The report also notes that 85 percent of all such fires in the CPSC Epidemiological study involved housing over 20 years of age. At a recent CPSC hearing, speakers mentioned that the cost of retrofitting such breakers would be 20-30 dollars more than a standard breaker plus the cost of electrician services.
The study by Terrance Karels of CPSC concluded that even with the cost of replacement and estimating only 50 percent effectiveness and the time it would take to retrofit houses, the benefits to the United States would be greater than the cost.
If CMP 17 begins to require cord-connected AFCIs or LCDIs to individual appliances, the benefits of AFCI circuit breakers becomes less. This could cause the cost-benefit equation to tip in the other direction and raise significant objections to the use or need for AFCI circuit breakers. If the economic cost were then to rise above the benefit, the US citizens may be deprived of the real benefits that panel-box mounted AFCI circuit breakers could bring to reducing home wiring fires, which are many times more prevalent than cord set related fires in a few appliances.
CMP 17 needs to review the actions they are taking not just in the narrow scope of whether this change is appropriate, but also as to what this action would mean to the greater acceptance of AFCIs in home wiring.
The answer is not to require cord-connected AFCIs or LCDIs but to work together on the technology and acceptance of circuit breaker AFCIs to protect all downstream electrical distribution applications.
Panel Meeting Action: Reject
Panel Statement: The substantiation does not support the deletion of the proposal.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-19 Log #3273 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-19 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Wayne Morris Fairfax, VA
Comment on Proposal No: 17-7
Recommendation: I do not support this proposal and ask CMP 17 to delete it.
Substantiation: Our opposition to this proposal is based on the following:
As a result of testing performed by manufacturers of Room Air Conditioners and testing at an independent laboratory with LCDI's in response to changes to the NEC in 2002, a number of disturbing facts about these devices have started to appear.
1. The maker of the code proposals 17-7 and 17-22 have stated to CMP 17 that LCDIs provide protection against wet environments and electric shock. Testing at an independent laboratory shows that LCDIs provide no real benefit to consumers regarding electric shock protection. Against wet environments of shock hazards, LCDI devices offer NO PROTECTION.
2. If an appliance were to be connected to an improperly sized (too small conductors) extension cord, the wires of the extension cord could melt and begin to ignite, but the LCDI device would not stop the fire. LCDIs provide no "upstream" protection. Use of improperly sized, cracked, frayed, or bare wires in extension cords would still be a hazard to consumers. Against this type of wiring hazard, LCDI devices provide NO PROTECTION.
3. If you cut the wires of an LCDI shielded cables with a knife when the cord set is not energized, and later return power to this device, the LCDI device will not open the circuit. Against this type of cord set fault, LCDI devices provide NO PROTECTION.
4. If you cut the wires of an LCDI shielded cable with a hacksaw when the cord set is not energized, and later return power to this device, the LCDI device will not open the circuit. Against this type of cord set fault, LCDI devices provide NO PROTECTION.
5. If you cut one of the connectors of an LCDI shielded cable with a pair of tin-snips when the cord set is not energized, and later return power to this device, the LCDI device will not open the circuit. This type of cord set fault, LCDI devices provide NO PROTECTION.
6. Recent testing at manufacturers have shown that production quantity units of LCDI cord-sets, when connected to appliances, have shown numerous problems. Nuisance tripping of 50 percent of the samples in one life test module showed the LCDI device opened the circuit when the fan speed was changed from low to high. The housing covers of production units of LCDIs have opened up in tests. The test and reset actuators of LCDIs have failed to function. Components are still being added to printed wiring boards in these devices when manufacturers discover fault conditions. These devices are not at the stage of production viability.
7. Cord-set type AFCIs still do not exist. Some manufacturers have promised that these devices would be available in 2001, 2002, or 2003 but as of today, no cord-connected AFCIs are listed by safety certification organizations and available for use by appliance manufacturers. This technology is not ready for usage by the fan or heater manufacturers. National Electric Code changes should not be make based on technologies that MIGHT be available at some future time.
CMP 17 should reject these proposals immediately.
Panel Meeting Action: Reject
Panel Statement: The purpose of AFCI and LDCI is not to protect against electrocutions.
The purpose of AFCI and LDCI is not to protect against line side extension cords.
The purpose of AFCI and LDCI is not to protect against cutting conductors with knife, hack saw, or tin snips while they are de-energized but to protect against stray currents (i.e., arcing) after they have been cut or damaged.
Defects in some sample sets does not constitute substantiation of inadequate technology.
Evidence has been presented to the CMP to the contrary.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-20 Log #3283 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-20 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Robert H. Miller, Lakewood Engineering & Mfg. Co.
Comment on Proposal No: 17-7
Recommendation: We oppose the adoption of this proposal in any form.
Substantiation: Our opposition to this proposal is based on the following:
Lakewood Engineering and Mfg. Co. has been a manufacturer of portable electric fans since 1947 and portable electric heaters since 1973. Recognizing that it is morally, financially, and legally in the best interests of the Company to ensure the safety of its products, Lakewood has always sought to be in the forefront of incorporating proven safety features which may address foreseeable risks associated with the use of their products. Lakewood however, has grave concerns regarding the NEC proposals mandating the use of AFCIs and LCDIs in its products, and based on the information to date, would not support those proposals.
From time to time, Lakewood has been contacted by consumers complaining that a cord on a purchased product was defective. After examining the returned unit and/or the unit's outlet into which it was plugged, we have been able to determine in the vast majority of instances that the cord was not defective, but the outlet was defective so as to preclude a tight connection. It is our understanding that the use of an AFCI or LCDI would not address either problem. In summary, we have not observed a single case in any of our customer returns where the alleged cord problem or defect would have been prevented by the inclusion of an AFCI or LCDI device.
Lakewood is not aware of any incident involving a purported cord failure so as to proximately cause a fire where the cord failure was conclusively determined to have occurred. The "problem and substantiation" for the proposal, while allegedly based on published CPSC data is, therefore, fundamentally flawed based on Lakewood's own claims experience, and for the reasons set out in the report by Heiden Associates evaluating the historical data of incidents.
Along with questioning the need for such devices in the absence of any claims data to support it, Lakewood also has grave concerns whether the inclusion of AFCIs and LCDIs only pose potential product hazards and foreseeable misuse of the product. Based on the report by Accident Reconstruction Analysis Inc., these devices could be the source of faults, shortened product life; nuisance tripping, and alteration and misuse of the product by the consumer to remove

the device to avoid these inherent problems. In addition, any benefits derived from AFCIs and LCDIs in the use of heaters in a damp environment or bathroom, is inconsistent with our own instructions and warnings against such use. Furthermore, the false sense of safety that such a device could provide might only encourage that proscribed use posing a far greater hazard.

For the reasons set forth above, and in the interest of ensuring consumer product safety which is objectively and thoroughly researched and evaluated, we would oppose the adoption of this proposal in any form. At a minimum, further examination and development should be undertaken to determine whether these safety devices are in fact justified, and just as importantly, whether they may create a whole new set of problems which did not already exist.

Panel Meeting Action: Reject

Panel Statement: The substantiation does not support the deletion of the proposal.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: LCDIs and AFCIs have the potential to eliminate or reduce fires in certain situations and their use is to be encouraged on a rational basis. There are still questions as to how much protection these devices will provide and which appliances could actually benefit from their use. With the recent introduction of LCDIs and AFCIs to protect cords of room air conditioners (reference NEC Sec. 440.65), much can be learned about the effectiveness of these protective devices in the next few years.

These technologies can be deployed in various ways including at panelboards, in receptacles, in plugs and elsewhere. There is, however, no overall plan to guide the most effective deployment of these devices and technologies. Without an overall plan or consensus on the most appropriate application of these technologies, there is potential for causing multiple devices to be required in various circumstances without adding benefit. NFPA should commission a task force to carefully study the existing data and information on this issue, document the protection characteristics of these technologies, identify fault conditions and associated hazards for which these devices can provide protection, collect as much new data as possible (from the room air conditioners, for example) and develop a recommendation as to their most appropriate application. The task force should be asked to recommend where the use of LCDIs and AFCIs for appliance cords makes sense and where they do not, and why. Without such a rational basis, requiring these devices as proposed burdens consumers of relatively low cost products with additional safety devices without the benefit of clear and convincing evidence that the devices most effectively serve safety in the applications addressed by the proposal.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-21 Log #3470 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-21 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Larry Albert, Black & Decker

Comment on Proposal No: 17-7

Recommendation: Black & Decker opooses the adoption of this proposal in any form.

Substantiation: a. From our analysis of the UL report of the CPSC related incidents involving fans and heaters there appears to be minimal statistical benefit for requiring these devices on the power cords on the indicated appliances.

b. There is no proven track record regarding these devices in cord installed applications and sparse field data regarding their efficacy in receptacle installations. Consideration of any benefits should wait until sufficient field information is available regarding receptacle installations.

c. There is an increased risk of electric shock in the case of LCDIs which have cords with energized outer braids. This is particularly troubling considering that many of the cords involved in the CPSC related incidents were found to have worn insulation. The increase in shock and electrocution is a very real anticipated effect of the use of LCDI that is not offset by the anticipated low probability of fire reduction.

d. The safety requirements regarding appliances should be left to those bodies, already in existence, that are committed to developing requirements for those appliances. These bodies (e.g. UL STPs) have a broad composition of participation that permits them to consider all factors in adopting new requirements, especially those that may mitigate safety benefit.

Panel Meeting Action: Reject

Panel Statement: The substantiation provided is not adequate to substantiate the proposal.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-22 Log #3479 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-22 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Gerry Schmidt, The Meral Ware Corp.

Comment on Proposal No: 17-7

Recommendation: I oppose the adoption of this proposal in any form.

Substantiation: My opposition to this proposal is based on the following:

1) Detailed investigations, by a statistical analyst, have verified that those promoting the above proposal have exaggerated the causes of fires involving electric fans and electric heaters. Out of 2,600 annual fires involving electric fans, no more than 19 could have benefited from the installation of the proposed devices. Similarly, of 2,800 annual fires in electric heaters, only 15 could have benefited by use of these devices. Without considerably more research, it is impossible to be certain that such devices would have obviated any of these incidents. In contrast, records indicate that 9,000 fires occur annually in outlets, plugs, extension cords, etc., which a cord-mounted AFCI would not detect. To require manufacturers of electric fans and electric heaters to comply with this proposal will yield minimal benefits, if any, to the American consumer. If this proposal were to be implemented, how can the NEC Panel justify such a massive undertaking by the manufacturers with such a minor benefit? A more practical solution is offered by the CPSC. They recommend the installation of AFCI devices in panel boxes to protect all household circuits - a more secure and cost effective plan.

2) The LCDI devices apparently are not ready for full production and appear to be in the concept stage of development. During acceptance tests of these devices, there have been many reports of this device activating spontaneously while the protected appliance was operating normally. In addition, there have been reports that these devices did not respond to electrical failures and simulated fault conditions. Device (LCDI) manufacturers claim their devices have been thoroughly field tested, but the results do not substantiate this.

3) Under certain conditions, an AFCI-protected appliance may not respond to highly dangerous arcing conditions. Supporting evidence of this is provided by tests conducted by an independent laboratory and their results confirm that the AFCI did not respond to these hazardous conditions.

It is apparent that further development and thorough examination is required prior to mandating their use by manufacturers of the affected appliances.

Supporting documentation for the above items will be presented at the Code Making Panel #17 at the December, 2003 Report on Comments meeting.

Panel Meeting Action: Reject

Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices.
At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The substantiation of the claim is not provided.

Note: This comment makes reference to Proposal 17-79 but it applies to 17-7. The panel will address it based the premise that it is a typo.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on Comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my explanation of negative vote on Comment 17-6.**Comment on Affirmative:**

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-23 Log #3482 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-23 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Lee Crawford, The Holmes Group

Comment on Proposal No: 17-7

Recommendation: We oppose the adoption of this proposal in any form.

Substantiation: The substantiation accompanying the original proposal outlines the risk of fire injury and death presented by portable electric space heaters and portable electric fans. This proposal maintains that damaged power supply cords account for the majority of fires involving short circuit, ground faults and electrical failure other than short circuit.

Furthermore, the proposal claims the use of in-cord LCDI or AFCI protection will eliminate the source of ignition in the majority of these fires. The use of GFCIs or ALCIs may have benefits associated with a reduction in shock hazard. However, our experience indicates that of the few faults that occur within a household appliance, cord-connected LCDIs and AFCIs will likely have very

limited value in preventing fires. As of today, in-cord AFCIs still do not exist. Manufacturers have little or no experience with this type of technology and therefore claims of reduction of fires are without merit.

LCDIs and AFCIs offer no protection from high resistance or glowing connections within the receptacle or the appliance. Neither the LCDI nor the AFCI is intended to detect glowing connections from resistance heating. For such detection to occur, the glowing connection would need to arc or to leak in order to be detected. LCDIs are limited to only supplying protection to the power cord between the plug and the product. They provide no protection inside the appliance. These devices may actually contribute an added fuel load to an open flame raising the temperature and prolonging the duration of such an event. In addition, these devices provide no protection against miswiring, poor connections, or broken terminals inside receptacles or extension cords where real protection is needed.

For the above reasons, these devices are far less suited to reducing fire hazard than related products are to reduce sock hazard. Accordingly, we oppose the addition of cord-connected LCDIs and AFCIs to portable electric space heaters and portable electric fans.

Panel Meeting Action: Reject

Panel Statement: At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The purpose of AFCI and LDCI is not to protect against high resistance connections.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-24 Log #3568 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-24 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Alex Aloi, Giacomo Ceola, De Longhi America

Comment on Proposal No: 17-7

Recommendation: We oppose the adoption of this proposal in any form.

Substantiation: Our opposition to this proposal is based on the following:

I disagree with the content of the original proposal, and with the points mentioned to support the benefits of AFCI and LCDI in fan heaters and radiators with respect to fire incidents. In particular, there are two points I want to emphasize.

The first one is that UL reports should consider more carefully the harm of a defective receptacle, power outlet. Many of the cases UL reported could be attributed to a faulty outlet, in which case we cannot conclude that an AFCI or LCDI device would have prevented the incident to happen. We all know that on a very broad statistic base, defective receptacles are one of the most common causes of domestic fires.

The second point I would like to address concerns the abused conditions that consumers often subject the products to: in particular the power cords. In this category, I would include also the inappropriate and undersized extension cords that are commonly used.

In addition, during my short experience in field inspections, I have seen (more often than we would think) spliced power cords: in this case an AFCI device in the original power cord would not help.

I believe UL should revise its proposal to the NEC.

Panel Meeting Action: Reject

Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices.

The devices are not intended as protection for extension cords.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-25 Log #3622 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-25 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Robert Davis, Hunter Fan Company

Comment on Proposal No: 17-7

Recommendation: We oppose this proposal in its entirety.

Substantiation: 1) The proposed components are not readily available.
2) NEC should not be doing Product Standards.
3) There is not substantial test data to support this proposal.

Panel Meeting Action: Reject

Panel Statement: At least one large manufacturer is presently providing LCDIs on all their electrical heaters

Charter of the NEC is to protect life and property from hazards arising from the use of electricity.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6

.Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-26 Log #3664 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-26 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Wayne M. Myrick, Sharp Electronics Corp

Comment on Proposal No: 17-7

Recommendation: I urge the CMP to reject this proposal.

Substantiation: The analysis of the data accompanying the original proposal exaggerates the benefits from the use of in cord LCDI or AFCI protection. Independent analysis of the data shows that the actual number of fires arising annually from unmodified heater power cords is negligible compared to the number of appliance in use. The majority of ignitions recorded are due to causes which are not addressed by the specified devices. There is insufficient justification to require in cord LCDI or AFCI devices on portable electrical heaters.

In addition, a technical study of AFCI and LCDI devices currently available, conducted by a recognized independent laboratory, has demonstrated that these devices do not always respond to the types of faults against which they are intended to protect.

Evidence to support the above substantiation will be presented to the Code Making Panel #17 during the December 2003 Report on Comments meeting.

In cord AFCI and LCDI devices do not have a track record to show that they are reliable and effective and that they do not result in newly created hazardous situations such as removal of the device, cord modification and receptacle damage due to torque and strain.

Panel Meeting Action: Reject

Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices

The substantiation presented is not adequate.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-27 Log #3667 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-27 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: John Seaman, Bemis Manufacturing Company

Comment on Proposal No: 17-7

Recommendation: Proposed new text recommends the addition of LCDI definition and installation of LCDI and AFCI protection devices incorporated in the power cord or attachment plug of Room Air Heaters. We oppose the adoption of this proposal and request the proposal be withdrawn. Further study must demonstrate effectiveness of the proposed devices, which are currently only in concept and development.

Substantiation: While AFCI receptacles have been mandated for bedroom use by the NEC, the successful use of these devices for small portable appliances has not been proven effective. This type of product is not yet commercially available for manufacturers to determine acceptability in their products. Portable cord or plug attachment LCDI and AFCI devices used with heaters must be thoroughly tested and proven to withstand the use conditions they will

be exposed to. There is also no guidance presented as to how a manufacturer is to select between the recommended devices. The successful application of these devices depends upon different technology, and our concern lies with potential undesirable results if applied improperly or not tested thoroughly.

The proposed devices may be susceptible to nuisance tripping arising from voltage and current spikes common in residential electrical supplies. If this happens during routine operation of the product, consumers may remove the device, thus leading to increased risk through improper repair, or by bypassing the intended protection. The construction of LCDI devices utilizes a sheath to sense fault conditions. This may lead to premature failure of the operation of the device as portable appliance cords are flexed.

Neither the LCDI of AFCI will react to series high-resistance arcing faults within the product, such as glowing connections or arc-tracking on component surfaces. These types of faults are a potential cause of ignition.

An independent technical analysis of LCDI and AFCI devices indicates their life expectancy may be shorter than the expected product life of heaters. When such a device fails, it may fail safe, but without indication it is not functioning. This could result in user false security. The device may also fail in a manner that is not safe. We have not seen data to support the fail-safe operation of such devices.

Panel Meeting Action: Reject

Panel Statement: At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The purpose of AFCI and LDCI is not to protect against high resistance connections.

The substantiation is not adequate.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-28 Log #3698 NEC-P17 **Final Action: Reject**
(422.2 and 422-16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-28 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Larry Johnson, National Presto Industries Inc.

Comment on Proposal No: 17-7

Recommendation: We oppose the adoption of this proposal in any form.

Substantiation: Incorporating a device that is electronic into a very simple, reliable product (portable air heaters) greatly concerns manufacturers, and may be a concern for the customer, in terms of function and reliability. National Presto and other AHAM members have been able to review a draft report from a recognized independent laboratory on the background and testing of current available devices. This report considered the limitations, failures, and the potential hazards of LCDI and AFCI devices.

The report listed 14 key conclusions. Here are a few that concern us:

° AFCIs and LCDIs are different devices that have limited response to various hazard conditions. This would mean that adding one of these devices would, at best, protect against only one type of hazard, if it added protection at all.

° Neither LCDIs nor AFCIs offer protection from high resistance or glowing connections within receptacles or extension cords. These are common faults that are reported in incident reports.

° The magnetic trip mechanisms of AFCI and LCDI devices make them susceptible to mechanical abuse nuisance tripping. This could be a source of customer complaints and/or returns or even customer action to disable the device.

° Overvoltage events that are harmless to most appliances can cause immediate failure of LCDI devices in a sometimes violent manner. This too could be a source of customer complaint, a hazardous situation, and/or return.

We encourage Code Making Panel 17 to reject the proposal to require AFCIs and LCDIs on air heaters. The devices have the potential to decrease reliability and add hazards to a product that is basic and has been a part of everyday life for decades. Additionally, at this point in time, one of the devices (the cord connected AFCI) does not exist and therefore, is not available for testing to show whether it will offer protection of any degree.

Panel Meeting Action: Reject

Panel Statement: The purpose of AFCI and LDCI is not to protect against high resistance connections.

At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The substantiation is not adequate.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-29 Log #3289 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(A)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-29 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Robert Cullen, Kaz, Incorporated

Comment on Proposal No: 17-7

Recommendation: Kaz opposes the adoption of this proposal.

Kaz is committed to designing, manufacturing and providing safe high quality products for the consumer market. Kaz consistently incorporates materials and safety devices that exceed the requirements of various regulatory agencies and standards in this effort.

Substantiation: Kaz is convinced that these devices do not provide the protection from the dangerous conditions cited by the proponents. The use of these devices can cause an increase in dangerous conditions due to the failure mode of the device itself.

1. The proposed AFCI and LCDI devices will not protect the consumer from the majority of the faults that cause dangerous conditions. This is self-evident to one skilled in the art and is also documented in a recent independent study that was conducted specifically to evaluate this proposal. This study will be presented to the panel during the December 2003 meeting.

2. AFCI and LCDI devices are sensitive electronic circuits designed to run continuously regardless of the operational state of the product connected to it. Because of this, the AFCI and LCDI devices are subjected to more frequent and higher exposure to voltage transients that can render them inoperative or cause dangerous catastrophic conditions within the protective devices itself. The appliance would either not be connected to (switched off) or be able to withstand the majority of these voltage transients if connected directly to the supply circuit.

3. Customer abuse, misuse and mean time to failure of all the connections, circuitry and internal components must also be calculated and given consideration when evaluating the limited benefit of these proposed devices verses the danger that the failure mode of these devices pose.

The devices that are proposed are not applicable or refined enough at this time to mandate their use.

Panel Meeting Action: Reject

Panel Statement: No substantiation has been provided.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-30 Log #2586 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-30 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

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

Comment on Proposal No: 17-7

Recommendation: The CMP should continue to accept this proposal in principle in part.

Substantiation: Portable room air heaters have been and continue to be a leading cause of residential fires. The proposal clearly documents a large number of cord fires resulting in multiple fatalities every year. Portable room air heaters are high current appliances which are operated while unattended and while people are sleeping. The portable nature of the product leaves the cord in harms way. Incorporation of proven and economical LCDI or AFCI technology will reduce the number of cord fires and associated deaths.

Precedents exist for incorporating this safety improvement into the NEC including422.41 Immersion protection of hair dryers, 422.49 GFCI protection for cord and plug connected high pressure sprayer washers, 680.40 GFCI protection for cord and plug connected pools and spas, and 440.65 AFCI/LCDIs protection for room air conditioners cord sets.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 17-4.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-31 Log #2925 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-31 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Ashley Sheffield, Euro-Pro
Comment on Proposal No: 17-7
Recommendation: I oppose the recommendation and believe the text should be left as is.
Substantiation: If the consumer has reason to believe that there is no threat of fire or shock hazard from a space heater then the heater is likely to be subjected to much worse circumstances than typically the consumer. Carelessness increases as hazard is potentially minimized. I don't believe that this provision will minimize the number of accidents related to space heaters but only increase the cost of manufacturing.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-32 Log #2992 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-32 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Richard J. Cripps, Association of Home Appliance Manufacturers
Comment on Proposal No: 17-7
Recommendation: I oppose the adoption of this proposal in any form.
Substantiation: My opposition to this proposal is based on the following:
1. The substantiation accompanying the original proposal makes exaggerated claims for the benefits that will accrue from the imposition of in-cord LCDI or AFCI protection. Independent analysis of verifiable statistics reveals that the actual number of fires arising annually in unmodified heater power supply cords is negligible compared to the number of appliances in use. The majority of ignitions recorded are proven by investigation to be due to causes which will not be addressed by the specified devices.
2. A technical study of LCDI and AFCI devices currently available, conducted by a recognized independent laboratory, has cast severe doubt on their effectiveness in responding to the types of fault against which they are intended to protect. Simulation of common operating conditions, both with and without additional external faults, has revealed many instances of devices failing to react as specified. Consumers will be given a false sense of security on the extent of protection being provided.
3. The proponent has made specific claims concerning the ability of LCDI devices to protect heaters used in bathrooms and other damp locations. The above technical study has revealed that no additional protection from the hazards of damp locations is actually provided by LCDI devices. Consumers will be induced to put themselves at additional risk if the proponent's claims are allowed to stand.

It is clear that considerable further examination and development needs to be carried out before these devices may confidently be used as the basis for prescriptive safety requirements. To do so before total reliability can be guaranteed will be a serious disservice to the appliance users of the United States.

Evidence to support the above substantiation will be presented to Code Making Panel 17 during the December 2003 Report on Comments meeting.
Panel Meeting Action: Reject
Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices.

No substantiation has been provided by the submitter.

The purpose of AFCI and LDCI is not to serve as a GFCI.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-33 Log #3098 NEC-P17 **Final Action: Reject**
(422.2 and 422.16 (B) (4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-33 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Ramona J. Saar Washington Grove, MD
Comment on Proposal No: 17-7
Recommendation: I do not support this proposal.
Substantiation: My opposition to this proposal is based on the following:
1. It has been demonstrated in independent tests that the design principles of LCDI devices currently on the market renders them inherently prone to nuisance tripping arising from relatively light impacts to the case or cover. My experience with the appliance consumer market has shown that when users are confronted with appliances which persistently shut down due to the action of an inherently unstable protective device, they will frequently take uninformed action to repair or disable that device. With cord-mounted protection, this is likely to result in the device being cut off and a regular attachment plug substituted or another cord spliced on, leading to an increased risk to consumers.
2. The physical bulk of the protective devices prevents the connection of two cords so equipped into a regular double receptacle. This will encourage the use of multi-way adapters, extension power strips and other undesirable practices, particularly in older dwellings where receptacles may already be in short supply and the house wiring may not be in good condition.
3. Instances have been reported of spontaneous tripping occurring in response to a routine operation of their appliance by a manufacturer performing acceptance tests using LCDI devices in conjunction with their product. It has been accepted by the LCDI manufacturer that the problem lies with the devices, and a design modification will be necessary.

Cases have also been reported of electrical failure and failure to respond to simulated faults. This demonstrates that the devices are still in the concept stage and not yet ready for full production and public distribution.

The device manufacturers are claiming that their products have been thoroughly tested in the field. This is clearly not the case. No new safety device should be mandated for use until it has been conclusively proven for the applications for which it is proposed, to the satisfaction of the manufacturers required to incorporate it in their products.
Panel Meeting Action: Reject
Panel Statement: At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The panel disagrees with the second statement; the device does not limit the number of appliances that could be connected to a duplex receptacle to a single receptacle

No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-34 Log #3100 NEC-P17 **Final Action: Reject**
(422.2 and 422.16.(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-34 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Lawrence Wethje, Association of Home Appliance Manufacturers
Comment on Proposal No: 17-7
Recommendation: We oppose the adoption of this proposal in any form.
Substantiation: Our opposition to this proposal is based on the following:

The maker of this Code Proposal, Mr. Schiff, has used as substantiation purported fire reports taken from newspaper clippings. This is hardly a fact-based approach to providing technical information to CMP 17. Just because a newspaper reporter would write that a fire was "caused by a faulty cord in a [X product]" does not represent a technical or forensic examination. Indeed, even fire investigation reports, insurance evaluations or CPSC In-Depth Investigation reports cannot be used without some judgment applied.

The Association of Home Appliance Manufacturers contracted with an outside, independent statistical firm to review the data used as substantiation. Their conclusion was that the maker of this code proposal has, "drastically overstated the prevalence of unit cord and plug fires, which account for no more than a few percent of the total number of incidents involving these types of appliances."

CMP17 should not accept a code proposal based on inaccurate information.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-35 Log #3202 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4).)

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-35 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 17-7
Recommendation: The panel should accept this proposal. Add new text to read as follows:

422.2 Definition Leakage Current Detection and Interruption (LCDI) Protection. A device provided in a power supply cord or cord set that senses leakage current flowing between or from the cord conductors and interrupts the circuit at a predetermined level of leakage current.

422.16(B)(4) Leakage Current Detection and Interruption (LCDI) and Arc Fault Circuit Interrupter (AFCI). Single-phase cord-and-plug-connected room air heaters shall be provided with factory-installed LCDI or AFCI protection. The LCDI or AFCI protection shall be an integral part of the attachment plug or be located in the power supply cord within 300 mm (12 in.) of the attachment plug.

Substantiation: Two thirds of the voting panel members agreed with the submitter that the number of deaths and fires from portable room heaters is not acceptable. From 1994 through 1998 there has been an average of 86 lives lost each year and 341 injuries from cord or plug electrical distribution (NFPA Fire Analysis and Research). Also Mr. Cripps, Mr. Sardian, Mr. Koessel and Mr. Hirsch express valid concerns as to the importance of upholding the consensus process in the different standards. However, as it is stated in 90.1 the purpose of the NEC is the practical safeguarding of persons and property from hazards arising from the use of electricity. The hazards encountered with the use of portable room heaters are not so much with the unit itself, but with the portability of the unit. In 440.65, cord and plug room air conditioners are required to have built-in LCDI protection. One of the reasons for this requirement is that these room air conditioners are installed and then removed every year thereby adding to the chances of damage to the supply cords. This hazard is amplified in portable room heaters because they may be connected and disconnected and moved every day. As stated in the submitter's proposal, it is a proven fact that AFCIs and LCDIs will save lives and reduce property loss. Statistics are always open to interpretation and may vary from survey to survey. The requirement for GFCI protection in bathrooms and kitchens has probably helped in reducing the number of deaths and fires in homes and perhaps someday the NEC will require all 120-volt receptacles to have the protection but until then the requirement for LCDI or AFCI protection to be factory installed in the supply cords will save lives.

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 Comment 17-4
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-36 Log #3293 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-36 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Steve Pastor, Royal Appliance Mfg. Co
Comment on Proposal No: 17-7
Recommendation: We are against the adoption of this proposal.
Substantiation: Our opposition to this proposal is based on the following:
1) Further investigation and studies should be done to determine the frequency and likelihood of nuisance trips that may occur in these types of protective devices. Underwriters Laboratories already has provisions in some standards such as UL 1017 that prohibit nuisance tripping of protectors under "normal" conditions due to the concern that a consumer may deliberately defeat or bypass the devices using unacceptable means to do so, thereby possibly increasing the potential shock or fire hazards risks associated with these products.
2) It seems more sensible to work towards requirements for the devices to be installed at the panel box which would offer more complete circuit protection (by including house wiring and outlets) as well as to cover other types of appliances besides just fans and heaters. It would also help to address concerns with existing appliances already in service.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my Explanation of Negative Vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-37 Log #3295 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-37 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Steve Pastor, Royal Appliance Mfg. Co
Comment on Proposal No: 17-22
Recommendation: We are against the adoption of this proposal.
Substantiation: Our opposition to this proposal is based on the following:
1) Further investigation and studies should be done to determine the frequency and likelihood of nuisance trips that may occur in these types of protective devices. Underwriters Laboratories already has provisions in some standards such as UL 1017 that prohibit nuisance tripping of protectors under "normal" conditions due to the concern that a consumer may deliberately defeat or bypass the devices using unacceptable means to do so, thereby possibly increasing the potential shock or fire hazards risks associated with these products.
2) It seems more sensible to work towards requirements for the devices to be installed at the panel box which would offer more complete circuit protection (by including house wiring and outlets) as well as to cover other types of appliances besides just fans and heaters. It would also help to address concerns with existing appliances already in service.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 6 Negative: 5
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-38 Log #3468 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-38 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Jack Wells, Pass & Seymour/Legrand
Comment on Proposal No: 17-7
Recommendation: The proposal should be accepted in principle and 210.8(A) should be revised to add a new section (9) to read as follows:

We urge CMP-17 to accept the portion of Proposal 17-7 related to 422.16(B)(4) and to continue to refer the definition to CMP-1.

Substantiation: The data supporting the proposal was, we believe, clearly attributed to independent credible sources and was accurately presented. Negative votes should be held to the same standard of credibility. It is not acceptable to simply dismiss the fire data presented as "questionable fire incident data". Credible analysis of the data or contradictory data (preferably from independent credible sources) is the least the submitter has the right to expect.

The negative comment that "only a small portion (of the fires) involve arcing" is unsupported by any documentation.

The proposal is clear in identifying the product to be protected as single-phase cord-and-plug connected fans. Bathroom, range hood and other fans cited do not fall into this category and the rationale for rejecting based on other types of fans not meeting this description is irrelevant.

Pass & Seymour/Legrand supports the philosophy that the NEC should not contain detailed product standards. However, we believe that the NEC must provide the foundation on which standards can be developed and, indeed, it does so in many areas. Placing a limited number of fundamental product requirements in the NEC does not weaken the "systematic integration of the NEC into the electrical safety system", it is an essential element of it. The NEC requires portable or movable signs to have factory installed GFCI protec-

tion [600.10(C)(2)], attachment plug caps for mobile homes to be of a specific NEMA configuration [550.10(C)], and numerous examples in addition to those cited by the submitter in the proposal substantiation. The LCDI/AFCI requirement for cord connected air conditioners is but one of many cited by the submitter. Standards Developing Organizations then use these foundation requirements and build them into their comprehensive product standards. In fact, standards developers have frequently told manufacturers that inclusion in the NEC is a prerequisite to coverage in a product standard. You can't have it both ways. The NEC can and must establish fundamental product requirements.

The fact that product standards committees are studying the problem does not appear to be a compelling reason for rejecting the proposal. The data presented covered over ten years of incident reports, ample time for the product standards committees to be aware of the problem and respond to it.

One negative comment referenced the panelists comment on Proposal 17-6. The relevance is certainly a stretch since that comment suggested requiring GFCI protection of the receptacle. In any case, the reason for voting negatively is seriously flawed. There are 100 million existing dwellings in this country and only 1.5 million homes built each year. The vast majority of residential fires are in older homes in poor areas, both urban and rural. Indeed, new homes are the place least likely to have a proliferation of cord connected heaters because they generally have adequate insulation and heating systems. Thus, the rationale of the negative completely misses the target of the proposal. The proposal is properly targeted at the portable cord connected space heater which is most frequently used in older homes in poor areas and are moved from room to room where retrofitting (AFCIs) is not required, not enforceable and highly unlikely to ever happen.

The explanation of the abstention is an appropriate comment in so far as it indicates that the panelist needed additional time to "scrutinize" the data. It would be appropriate that the results of this further analysis be available for discussion by the Panel and published as part of any panel statement, negative vote or abstention. While we agree philosophically that the NEC should not serve as a product standard, we further believe as discussed above, that it is essential for the NEC to continue to mandate fundamental product requirements.

We appreciate the opportunity to participate through the comment process. We have endeavored to respond to each of the reasons cited for negative votes or abstentions and strongly encourage the panel to accept the increased protection in fire safety that will be afforded by this proposal.

Panel Meeting Action: Accept

Panel Statement: The panel assumes the first sentence in the comment recommendation is a typo because it is out of context.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my Explanation of Negative Vote on Comment 17-6.**Comment on Affirmative:**

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-39 Log #3480 NEC-P17 **Final Action: Reject**
(422.2 and 422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-39 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Gerry Schmidt, The Meral Ware Corp.

Comment on Proposal No: 17-22

Recommendation: I oppose the adoption of this proposal in any form.

Substantiation: My opposition to this proposal is based on the following:

1) Detailed investigations, by a statistical analyst, have verified that those promoting the above proposal have exaggerated the causes of fires involving electric fans and electric heaters. Out of 2,600 annual fires involving electric fans, no more than 19 could have benefited from the installation of the proposed devices. Similarly, of 2,800 annual fires in electric heaters, only 15 could have benefited by use of these devices. Without considerably more research, it is impossible to be certain that such devices would have obviated any of these incidents. In contrast, records indicate that 9,000 fires occur annually in outlets, plugs, extension cords, etc., which a cord-mounted AFCI would not detect. To require manufacturers of electric fans and electric heaters to comply with this proposal will yield minimal benefits, if any, to the American consumer. If this proposal were to be implemented, how can the NEC Panel justify such a massive undertaking by the manufacturers with such a minor benefit? A more practical solution is offered by the CPSC. They recommend the installation of AFCI devices in panel boxes to protect all household circuits - a more secure and cost effective plan.

2) The LCDI devices apparently are not ready for full production and appear to be in the concept stage of development. During acceptance tests of these devices, there have been many reports of this device activating spontaneously while the protected appliance was operating normally. In addition, there have been reports that these devices did not respond to electrical failures and simulated fault conditions. Device (LCDI) manufacturers claim their devices have been thoroughly field tested, but the results do not substantiate this.

3) Under certain conditions, an AFCI-protected appliance may not respond to highly dangerous arcing conditions. Supporting evidence of this is provided by tests conducted by an independent laboratory and their results confirm that the AFCI did not respond to these hazardous conditions.

It is apparent that further development and thorough examination is required prior to mandating their use by manufacturers of the affected appliances.

Supporting documentation for the above items will be presented at the Code Making Panel #17 at the December, 2003 Report on Comments meeting.

Panel Meeting Action: Reject

Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices.

At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

Substantiation of the claim is not provided.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.

CRIVELL: See my explanation of negative vote on comment 17-4.

HIRSCH: See my Explanation of Negative Vote on Comment 17-4.

HUTCHINGS: See my explanation of negative vote on Comment 17-20.

KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my Explanation of Negative Vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-40 Log #3203 NEC-P17 **Final Action: Reject**
(422.4)

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 17-5

Recommendation: The panel action should be accept in principle. 422.4 Live Parts should have a new last sentence added that would read: Appliances which include an electrical disconnecting means shall have physical protection provided to protect the worker from accidental contact with line side conductors.

Substantiation: The panel was correct that the submitter's proposal was not specific as to section to which proposal should be applied. However, the submitter's idea of providing protection from line side conductors on appliances that have "built-in" disconnecting means would add another level of protection for the repairmen who may not be electricians. This Comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject

Panel Statement: The original proposal did not provide any wording or placement in the Code. The comment introduces new material. The definition of a disconnecting means in Ariticle 100 would result in any "on / off" switch having to be protected. The requirement is not necessary if the worker follows proper lockout and tagout procedures.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 11

17-41 Log #98 NEC-P17 **Final Action: Accept**
(422.11(E)(3))

Note: The Technical Correlating Committee understands that the action on this Comment reaffirms the "Acceptance" of Proposal 17-10.

Submitter: Dan Leaf Rancho Santa Margarita, CA

Comment on Proposal No: 17-10

Recommendation: Accept the proposal.

Substantiation: Present literal wording only permits the next higher STANDARD rating. Why should a higher nonstandard rating not be permitted? 430.52(C)(1) Example Number 1 permits intermediate higher ratings less than the next higher standard rating. If there is a technical reason for the difference, would the panel please clarify what it is? Since this section differs from 430.52(C)(1) Example Number 1, Code users may deem that if motors are not involved an intermediate nonstandard higher rating cannot be used.

Panel Meeting Action: Accept

Number Eligible to Vote: 11

Ballot Results: Affirmative: 10 Negative: 1

Explanation of Negative:

HUTCHINGS: The panel accepted Comment 17-41 which will accept Proposal 17-10. Comment 17-41 should be rejected for the following reasons:

1. The submitter indicated that his comment was on Proposal 17-10 but his substantiation supports Proposal 17-11. Proposal 17-10 has already been accepted by the panel.

2. Accepting Proposal 17-11 is not necessary. Accepting 17-11 will allow non-motor operated appliances to be protected by "nonstandard" rated overcurrent protective devices but Listed nonstandard rated protective devices do not exist. The submitter references 430.52(C)(1) as an example of where nonstandard rated devices may be used but 430.52(C)(1) covers the protection of motors were adjustable combination motor controllers are often used for protection.

Comment on Affirmative:

ROCK: During discussions, the panel accepted the Comment submitter's Recommendation, but not Comment submitter's Substantiation regarding nonstandard overcurrent protection ratings.

17-42 Log #1865 NEC-P17 **Final Action: Accept**
(422.12 Exception (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-12
Recommendation: Accept the proposal in principle. Designate the existing exception as Exception No. 1 and insert a new Exception No. 2 as follows:
Exception No. 2: Permanently connected air conditioning equipment shall be permitted to be connected to the same branch circuit.
Substantiation: The panel statement is correct, but the proposal can easily be corrected to take the objection into account. The substantiation for including this requirement in the NEC went to the hazard of frozen pipes if another load had an undetected failure that opened the circuit. An air conditioning load is clearly a noncoincident load for which this objection would not apply.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-43 Log #1866 NEC-P17 **Final Action: Reject**
(422.12 Exception No. 2 (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-14
Recommendation: Accept the proposal.
Substantiation: A service receptacle for heating equipment should not be expected to create the difficulty that prompted the frankly questionable (per 90.1) inclusion of this section in the 1990 NEC. The issue was the possibility of unattended freeze-ups caused by other loads experiencing a failure and tripping the overcurrent device. Although it would admittedly be possible for some other load to be plugged into the service receptacle and left unattended, the likelihood is sufficiently remote and the practicality of this proposal and others like it support this very modest relaxation of the rule.
Panel Meeting Action: Reject
Panel Statement: The panel reaffirms its original panel statement on Proposal 17-14. A service receptacle on the same branch circuit as the equipment would become deenergized when the equipment is deenergized, and service personnel may hesitate to disconnect the equipment.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-44 Log #92 NEC-P17 **Final Action: Reject**
(422.16(B)(4) (New))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 17-21
Recommendation: Delete No. 5 of the Panel Action.
Substantiation: Proposals 17-19 and 17-21 relate only to the wiring method (cable, conduit, cord, and plug). No substantiation was related to the necessity for a separate circuit, or the rating of a microwave type hood. 210.23 permits cord-connected equipment rated up to 50 percent of a multioutlet general lighting and receptacle circuit. The majority of range hoods do not warrant a separate circuit, which appears to be a design consideration which may never be needed. No data was provided to indicate how prevalent replacement with microwave type hoods is. 90.1(B) indicates Code provisions do not necessarily provide for future expansion of electrical use, which this provision seems to be.
Panel Meeting Action: Reject
Panel Statement: Due to the likelihood of consumers performing the replacement of the hood and/or hood-microwave combination, and the large ampere draw of a microwave oven, the use of an individual branch circuit provides additional safety measures not otherwise available.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-45 Log #433 NEC-P17 **Final Action: Accept in Principle in Part**
(422.16(B)(4))

Submitter: William H. King, Jr., U.S. Consumer Product Safety Commission
Comment on Proposal No: 17-6
Recommendation: I support the panel's action as written to accept the proposal in principle in part. However, I do not support one change provided as a "Comment on Affirmative" in the ROP to remove the words "For new and remanufactured machines" from part (1) of 422.16(B)(4).
Substantiation: The words "For new and remanufactured machines" are necessary in part (1) of this paragraph to distinguish new and remanufactured machines from existing older machines. Only existing machines should be permitted to be connected to receptacle outlets protected by GFCIs. For added clarity, I recommend adding words to part (3) of 422.16(B)(4)) as follows:
(3) Vending machines other than new and remanufactured machines, shall be connected to a circuit protected by a ground-fault circuit-interrupter. This clarifies the intent that machines manufactured after adoption of the new code shall have either integral GFCI protection or be double insulated. Vending machines are utilized at locations where GFCI protection at the branch circuit level may not be provided. Therefore, providing the necessary protection for future machines should rest with the equipment manufacturer/remanufacturer.
Panel Meeting Action: Accept in Principle in Part
Panel Statement: For clarification, the panel accepts the submitter's recommendation, but rejects the recommendation in the substantiation. See panel action and statement on Comment 17-3.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
CRIPPS: See my explanation of negative vote on Comment 17-3.
HIRSCH: See my Explanation of Negative Vote on Comment 17-3.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
Comment on Affirmative:
HUTCHINGS: See my affirmative comment on Comment 17-3.

17-46 Log #1279 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-46 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Aaron B. Chase, Leviton Mfg. Co. Inc.
Comment on Proposal No: 17-22
Recommendation: Accept original proposal as modified by Panel.
Substantiation: The original substantiation and subsequent research conducted by UL since the publication of the ROP strongly warrant the justification of adopting this Proposal that will reduce the loss of life and property due to fires caused by damaged fan cords. UL's research department evaluated 464 in-depth investigations. This represents 17.85 percent of the annual fires attributed to fans. 332 IDIs were not evaluated either due to insufficient information or non-applicable incidents. The remaining 132 incidents evaluated revealed that 11 incidents could have been prevented by an LCDI or AFCI. The total number of IDIs reviewed represented to 5.08 percent of electric fan fires. Based on UL's study of 5.08 percent of annual fires, it can be concluded that 217 incidents could have been prevented annually. Further, this number, although staggering, could very well be higher if spliced cords that resulted in fires were not omitted from the evaluation. Typically, cords that are spliced are because they were damaged resulting in a greater number of fires. LCDI/AFCI technology could have prevented these fires too.
The negative comments pertaining to the Proposal that this should be addressed in the product standard versus the installation Code are contradictory to many existing precedents already contained in the NEC. The NEC has proven to be a valuable mechanism for driving product standards. These past precedents have led to the reductiion of loss of life and property. More importantly, by incorporating these requirements in the NEC this puts an important safeguard in place that would prohibit any other SDOs or certifying bodies from not enforcing this as the Code supersedes all, hence the importance of NEC adoption.
This also provides a mechanism for the CPSC to guard against unsafe inferior products entering the stream of commerce, in the absence of a listed product.
The incorporation of dedicated safety devices on appliances such as hair dryers, room air conditioners and high pressure washers are all examples of where the adopton in the NEC has led to a product standard change. There are many more examples within the NEC where electrical products are not part of the permanent infrastructure but used in conjunction with the infrastructure require safety devices.
It is the obligation of Panel members to incorporate new technology that can reduce hazardous conditions that result in the loss of life and property. The technology exists. One of the major product safety standards development organizations STP has met to discuss this issue among other topics and has failed to take any action to safeguard against these hazards. Additionally, with the Negative comment by Mr. Cripps, he cites the broad scope of UL 507. However, the wording of the Panel modified proposal clearly delineates that the requirements pertains to cord and plug connected and not the other product types cited by Mr. Cripps.
Panel Meeting Action: Accept in Principle
Modify the panel meeting action on the proposal by changing the section from 422.6 (B) (7) to 422.53.
Panel Statement: This requirement belongs in Part IV. Construction.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.

SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-47 Log #1282 NEC-P17 **Final Action: Accept in Principle in Part**
(422.16(B)(4))

Submitter: Aaron B. Chase, Leviton Mfg. Co. Inc.
Comment on Proposal No: 17-6
Recommendation: Accept the Panel Action. But revise the text as follows:
Proposed 422.16(B)(4) should be revised: "~~to one or more of the following~~" "both" instead of "one of the following." Proposed 422.16(B)(4) item #(3) should be renumbered to 422.16(B)(4) item #2.
Substantiation: A system of double insulation does not provide the same level of protection as an integral GFCI cord damage or ingress of water would not provide the protection against electric shock that a GFCI can. Additionally, vending machines should be connected to GFCIs but they must also be provided with factory installed integral protection. Vending machines may be relocated thus necessitating the need for dedicated GFCI protection.
Panel Meeting Action: Accept in Principle in Part
See panel action on Comment 17-3.
Panel Statement: See panel action and statement on Comment 17-3. The panel does not accept the mandatory redundancy.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 8 Negative: 3
Explanation of Negative:
CRIPPS: See my explanation of negative vote on Comment 17-3.
HIRSCH: See my Explanation of Negative Vote on Comment 17-3.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
Comment on Affirmative:
HUTCHINGS: See my affirmative comment on Comment 17-3.

17-48 Log #1353 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-48 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Anthony Pulsonetti Glen Head, NY
Comment on Proposal No: 17-22
Recommendation: Reject the Panel Action and Accept the Proposal as modified by the Panel.
Substantiation: The Panel members that voted in the negative stating that this should be addressed in the product standard and not the installation Code are wrong. The NEC Article 422 covers appliances used in an occupancy. Should we delete the entire Section 422 with this logic? Many lives have been saved by the adoption of 422.41. The Proposal in essence is the same as Section 422.41 except it is requiring a different technology to prevent against a different hazard, namely electrical fires. Please incorporate these safety devices so that lives are spared.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-46.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my Explanation of Negative Vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-49 Log #2030 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-49 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Christian Prestat, Groupe SEB
Comment on Proposal No: 17-22
Recommendation: We do not support this proposal as submitted.
Substantiation: 1) We agree to increase the safety of appliance such as heaters and fans but in this case, we are not sure that conformity of products to the new proposal solve all problems of cord failures.
An important parameter is to keep these cords which are sometimes frequently plugged, unplugged and rolled around the product in a good condition of use.
2) Both AFCIs and LCDIs devices involve electronic control system and failure could occur in these devices due to electromagnetic phenomena (wide use of mobile phone, high frequency transmitting systems and electronic appliance controls).
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my Explanation of Negative Vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-50 Log #2585 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-6 and Comment 17-50 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 17-6
Recommendation: The CMP should continue to Accept in Principle in Part but revise the text as follows: Proposed 422.16(B)(4) item #(2) should be deleted. Proposed 422.16(B)(4) item #(3) should be renumbered to 422.16(B)(4) item #(2).
Substantiation: A system of double insulation, as an alternative to GFCI protection, does not provide protection against supply cord damage that could energize the conductive enclosure of a vending machine lacking a grounding/bonding path compromised by that same supply cord damage. Additionally, many of these machines are used in outdoor locations; the system of double insulation alone would not provide adequate protection as that of GFCI protection against electrical shock resulting from the ingress of water into portions of the vending machine not intended to handle, transport of process liquids. Water ingress in an outdoor environment can compromise spacings of a system of double insulation. When used outdoors, electrical gardening tools and power tools that are double-insulated are required additionally by the NEC to be powered from GFCI-protected outlets.
Panel Meeting Action: Accept in Principle in Part
See panel action on Comment 17-3.
Panel Statement: See panel action and statement on Comment 17-3.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 7 Negative: 4
Explanation of Negative:
CRIPPS: See my explanation of negative vote on Comment 17-3.
HIRSCH: See my Explanation of Negative Vote on Comment 17-3.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
HUTCHINGS: See my affirmative comment on Comment 17-3.

17-51 Log #2588 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-51 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Vince Baclawski, National Electrical Manufacturers Association (NEMA)
Comment on Proposal No: 17-22
Recommendation: The CMP should continee to accept this proposal in principle, as worded in the code panel action.
Substantiation: Electric fans have been and continue to be a leading cause of residential fires. The March 12, 2002 letter from the CPSC to Underwriters Laboratories clearly documents the application related cause of the cord fires. Incorporation of proven and economical LCDI or AFCI technology will reduce the number of cord fires and associated deaths. Precedents exist for incorporating this safety improvement into the NEC including Article 422.41 Immersion protection for hair dryers, 422.49 GFCI protection for cord and plug connected high pressure sprayer washers. 680.40 GFCI protection for cord and plug connected pools and spas, and 440.65 AFCI/LCDIs protection for room air conditioners cord sets.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-46.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my Explanation of Negative Vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-52 Log #2845 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-52 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Edward A. Schiff, Technology Research Corp.
Comment on Proposal No: 17-22
Recommendation: The CMP should accept in principle in part with the panel's recommended editorial revision.
Substantiation: The commentor wishes to express his appreciation to the members of CMP 17 for their time and consideration and also recognize the efforts of Underwriters Laboratories for taking the initiative and time to provide the CMP with additional data.

The UL evaluation of the CPSC in-depth investigations provides a random sampling of events. Of the 464 investigations, 242 were not applicable and 90 had insufficient data to determine the cause. This leaves us with a random sampling of 132 incidents for evaluation. Of the 132 incidents, 25 non-spliced cord fires were evaluated. It was determined that 11 would have been prevented, 7 events were unsure if LCDI/AFCI would have been prevented and 5 there was insufficient information to determine the affect of the added protection. The study did not include spliced cords which the submitter feels is an error. "Spliced" is an undefined term that includes incidents where damaged insulation is taped and the likely reason for splicing a cord is cord damage. Spliced cord incidents would in many cases be eliminated by these technologies.

The UL study indicates that portable caused 2,600 fires which resulted in 10 deaths, 120 civilian injuries and $36 million in property damage. Based on the data provided in the random sampling from the UL report, this would indicate that there are 217 unspliced cord fires occur each year that would be prevented by AFCI or LCDI protection. An additional 84 unspliced cord fires might be prevented and 60 events are undetermined. Obviously, a serious problem does exist that can be prevented even without incorporating sliced cords.

Two of the panel members expressed that this was a product standard issue. There are a number of past precedents for incorporation into the code as cited in the original proposal. CMP 17 has taken action to improve the safety of vending machines because of the obvious hazard and two deaths that have occurred. This appliance has far more incidents of preventable problems and associated deaths. This technology is proven, economical and will reduce fires and needless deaths.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-46.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-53 Log #2849 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that this Comment be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative. Since there is consensus on Comment 17-3, on the same proposal, the panel action on Comment 17-3 remains "Accept in Principle in Part."
Submitter: Edward A. Schiff, Technology Research Corp.
Comment on Proposal No: 17-6
Recommendation: The CMP should continue to accept in principle in part but revise the text as follows: Proposed 422.16(B)(4) item # (2) and 422.16(B)(4) item # (3) should be deleted.
Substantiation: A system of double insulation, as an alternative to GFCI protection, does not provide protection against supply cord damage. Double insulation was removed as an alternative to GFCI protection for pressure washers for this exact reason. A damaged power supply cord poses a shock and fire hazard and could energize the enclosure when the grounding path is compromised by a miswired or damaged receptacle or the cord damage. Vending machines are used in outdoor locations where water can enter the enclosure which would defeat the protection from double insulation.

The option for a GFCI outlet is difficult to enforce and there is no guarantee that the vending machine will be afforded this protection. The submitter's intent appears to be to require existing vending machines, without this protection, to be plugged into a GFCI receptacle. Although this is a great idea, it is a retroactive requirement and, therefore, not enforceable.
Panel Meeting Action: Accept in Principle in Part
See panel action on Comment 17-3.
Panel Statement: See panel action and statement on Comment 17-3.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 7 Negative: 4
Explanation of Negative:
CRIPPS: See my explanation of negative vote on Comment 17-3.
HIRSCH: See my Explanation of Negative Vote on Comment 17-3.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
HUTCHINGS: See my affirmative comment on Comment 17-3.

17-54 Log #2924 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-54 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Ashley Sheffield, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: The text should be left as is.
Substantiation: I oppose the recommendation because I feel that it will provide the consumer with a false sense of security in the event that either LCDI or AFCI fails, as they sometimes do. This false sense of security causes individuals to become more careless when handling appliances. In short, I don't believe that this provision would do mush more than increase manufacturing costs.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-55 Log #2927 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-55 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Simon Andras, Euro-Pro Inc.
Comment on Proposal No: 17-22
Recommendation: I oppose the adoption of the proposal.
Substantiation: Further development is neccessary per reliable AFCI and LCDI operation.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-56 Log #2931 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-56 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Victor Smith, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: I oppose it.
Substantiation: If we implement this new proposal, what guarantee that it will make a significant change, and if not much, where does it end. Some point in time the responsibility has to lie on the consumer, rather than the manufacturer, and the time is now.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-57 Log #2933 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-57 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Eric Wall, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: Oppose new standard.
Substantiation: - Will not improve on the utilization of extension cords with the products. Extension cords would defeat the purpose of using LCDI or AFCI protection.
- Cost increase would be absorbed solely by manufacturers. This would be due to all products having LCDI or AFCI protection, which provides no product distinction between products in the market place.
Panel Meeting Action: Reject
Panel Statement: The devices are not intended as protection for extension cords. Cost is not a consideration for safety in the Code making process.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6
.**Comment on Affirmative:**
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-58 Log #2937 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-58 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Ralph Hudnall, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: I oppose this proposal in its entirety.
Substantiation: Studies have indicated AFCIs and LCDIs may not prevent the situations mentioned in these proposals. This leads to a false sense of security in consumer's minds, leading to more problems than we currently face. Especially with regard to their use in damp areas as neither of the referenced devices are hermetically sealed against intrusion of moisture.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-59 Log #2938 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-59 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: James Pierce, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: I do not agree with it.
Substantiation: False sense of security for the consumer.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-60 Log #2942 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-60 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Mason Greene, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: I disagree with the proposed changes to 422.2 and 422.16(B)(4).
Substantiation: None submitted.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6
.**Comment on Affirmative:**
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-61 Log #2944 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-61 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Chad Reese, Euro-Pro
Comment on Proposal No: 17-22
Recommendation: Do not implement nex text.
Substantiation: This type of change complicates the product for the consumer and makes them likely to attempt modification to the product causing additional danger. This change should be implemented for new building construction so it effects anything down stream of the outlet.
Panel Meeting Action: Reject
Panel Statement: No substantiation has been provided.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-62 Log #2979 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-6and Comment 17-62 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Steve Campolo, Leviton Manufacturing Co., Inc.
Comment on Proposal No: 17-6
Recommendation: Continue to accept the panel modified text, in item #1, eliminate item #2 and add to #3 "...when hard wired".
Substantiation: Double insulation offers no personnel protection when that many vending machines are located outdoors. By adding the "when hard wired" modifier, the usage of the vending machine on an unprotected circuit is eliminated.
Panel Meeting Action: Accept in Principle in Part
The panel accepts the elimination of item 2 but rejects the recommended wording in item 3.
Panel Statement: There is insufficient substantiation to require GFCI protection on hard-wired vending machines. See panel action and statement on Comment 17-3.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 7 Negative: 4
Explanation of Negative:
CRIPPS: See my explanation of negative vote on Comment 17-3.
HIRSCH: See my Explanation of Negative Vote on Comment 17-3.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

17-63 Log #2989 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-63 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Richard J. Cripps, Association of Home Appliance Manufacturers
Comment on Proposal No: 17-22
Recommendation: We oppose the adoption to this proposal in any form.
Substantiation: Our opposition to this proposal is based on the following:
1. The proponents of 2005 NEC Proposals 17-7 and 17-22 have used as substantiation that purported numbers of fires associated with fans and heaters. The Association of Home Appliance Manufacturers contracted with a highly regarded statistical review firm, Heiden Associates to determine if the statistics cited were accurate. The report of Heiden Associates on this subject will be presented at the December NEC Code making Panel 17 meeting. However, the executive summary of the October xx, 2003 Heiden Associates report states, "Our analysis shows that the proponents have drastically overstated the prevalence of unit cord and plug fires, which account for no more than a few percent of the total number of incidents involving these types of appliances. In addition, several of the statistics included in the proposal substantiation are flatly contradicted by the very sources the NEC-17-7 and NEC-17-22 proponents cite in support of their claims. This report demonstrates that if these errors and misstatements are corrected and more reliable techniques are used to investigate the fire hazard profiles associated with this equipment, adopting these proposals will have, at best, a very minimal impact on the number of fires involving portable electric heaters and fans."
2. The proponents of code proposals 17-7 and 17-22 have misrepresented the facts regarding the risks involved and the subsequent societal impact of requiring devices such as cord-connected AFCIs or LCDIs on fans and heaters. The proponent of the fan proposal, Mr. Chase, has presented 23 CPSC In-Depth-Investigation reports of supposedly fires involving fans with cord sets. The inference is that all of these would have been alleviated by the use of an LCDI or AFCI. Mr. Chase has conveniently eliminated many facts, that upon reading these reports further, would tell the investigator that a cord-connected AFCI or LCDI device would have no effect. He has conveniently left out such details as: Wires that show beading which are a result of the fire and not the cause, many instances where the receptacle was the cause, not the fan, houses that had fuses replaced with improper ones, cord sets that were modified by consumers, reports which specifically say the fan was not the cause, and reports where consumers had problems with the fan or the house wiring long before the fire. In the September 10, 2003 UL report and in the October, 2003 Heiden & Associates report, after careful scrutiny, only a few percent might possibly have been affected by a cord-connected AFCI or LCDI. And, based on the incompleteness of fire investigation reports, it is impossible to know from these whether such a device would have any effect. Waving dozens of purported IDI reports that do not tell the whole story, is not a way for the code panel to make decisions on such an important issue.
Panel Meeting Action: Reject
Panel Statement: The UL provided data conflicts with the first statement. The panel does not agree that the facts were misrepresented. The "data" cited in substantiation is not quantified (e.g., only a few percent).
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-64 Log #2991 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-64 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Richard J. Cripps, Association of Home Appliance Manufacturers
Comment on Proposal No: 17-22
Recommendation: I oppose the adoption of this proposal in any form.
Substantiation: Our opposition to this proposal is based on the following:
1. The substantiation accompanying the original proposal makes exaggerated claims for the benefits that will accrue from the imposition of in-cord LCDI or AFCI protection. Independent analysis of verifiable statistics reveals that the actual number of fires arising annually in unmodified heater power supply cords is negligible compared to the number of appliances in use. The majority of ignitions recorded are proven by investigation to be due to causes which will not be addressed by the specified devices.
2. A technical study of LCDI and AFCI devices currently available, conducted by a recognized independent laboratory, has cast severe doubt on their effectiveness in responding to the types of fault against which they are intended to protect. Simulation of common operating conditions, both with and without additional external faults, has revealed many instances of devices failing to react as specified. Consumers will be given a false sense of security on the extent of protection being provided.
3. The proponent has made specific claims concerning the ability of LCDI devices to protect heaters used in bathrooms and other damp locations. The above technical study has revealed that no additional protection from the hazards of damp locations is actually provided by LCDI devices. Consumers will be induced to put themselves at additional risk if the proponent's claims are allowed to stand.
It is clear that considerable further examination and development needs to be carried out before these devices may confidently be used as the basis for prescriptive safety requirements. To do so before total reliability can be guaranteed will be a serious disservice to the appliance users of the United States.
Evidence to support the above substantiation will be presented to Code Making Panel 17 during the December 2003 Report on Comments meeting.
Panel Meeting Action: Reject
Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices.
No substantiation has been provided.
The purpose of AFCI and LDCI is not to serve as a GFCI.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-65 Log #3052 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-65 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Steve Campolo, Leviton Manufacturing Co., Inc.
Comment on Proposal No: 17-22
Recommendation: Accept the original proposal as modified by the panel.
Substantiation: UL indicated that the fan data needed analysis. That analysis has been submitted. The UL analysis is clear in explaining how the original (modified) proposal would reduce incidents. Given the opposition to this proposal, the UL-STP will fare no better unless the NEC sends a clear position upon which to act.
Note: Supporting material is available for review at NFPA Headquarters.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-46.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-66 Log #3099 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-66 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Ramona J. Saar Washington Grove, MD
Comment on Proposal No: 17-22
Recommendation: I do not support this proposal.
Substantiation: My opposition to this proposal is based on the following:
1. It has been demonstrated in independent tests that the design principles of LCDI devices currently on the market renders them inherently prone to nuisance tripping arising from relatively light impacts to the case or cover. My experience with the appliance consumer market has shown that when users are confronted with appliances which persistently shut down due to the action of an inherently unstable protective device, they will frequently take uninformed action to repair or disable that device. With cord-mounted protection, this is likely to result in the device being cut off and a regular attachment plug substituted or another cord spliced on, leading to an increased risk to consumers.
2. The physical bulk of the protective devices prevents the connection of two cords so equipped into a regular double receptacle. This will encourage the use of multi-way adapters, extension power strips and other undesirable practices, particularly in older dwellings where receptacles may already be in short supply and the house wiring may not be in good condition.
3. Instances have been reported of spontaneous tripping occurring in response to a routine operation of their appliance by a manufacturer performing accep-

tance tests using LCDI devices in conjunction with their product. It has been accepted by the LCDI manufacturer that the problem lies with the devices, and a design modification will be necessary.

Cases have also been reported of electrical failure and failure to respond to simulated faults. This demonstrates that the devices are still in the concept stage and not yet ready for full production and public distribution.

The device manufactures are claiming that their products have been thoroughly tested in the field. This is clearly not the case. No new safety device should be mandated for use until it has been conclusively proven for the applications for which it is proposed, to the satisfaction of the manufacturers required to incorporate it in their products.

Panel Meeting Action: Reject

Panel Statement: At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The panel disagrees with the second statement; the device does not limit the number of appliances that could be connected to a duplex receptacle to a single receptacle.

No substantiation has been provided.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-67 Log #3201 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-67 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Michael I. Callanan, IBEW

Comment on Proposal No: 17-22

Recommendation: The Panel should accept this proposal.

422.16(B)(4) Cord-and-Plug-Connected Electric Fans. All single-phase cord-and-plug-connected electric fans shall be provided with factory-installed LCDI and AFCI protection. The LCDI or AFCI protection shall be an integral part of the attachment plug or be located in the power supply cord within 300 mm (12 in.) of the attachment plug.

Substantiation: The panel's action to accept this proposal is the correct action. According to the NFPA, 17% of home electrical distribution fires and 28% of the deaths are from cord and plug connected equipment. This statistic can be reduced with the use of LCDI or AFCI protection. Please see my comment on Proposal 17-7. Many of the problems with cord-connected equipment are that the public is not well educated in the proper care and sizing requirements of cords and plugs. Just as the increased use of power tolls by homeowners has caused that industry to develop shields and guards to protect untrained consumers, we in the electrical industry must promote the use of the new technologies that save lives.

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 Comment 17-46.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-68 Log #3258 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-68 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Wayne Morris Fairfax, VA

Comment on Proposal No: 17-22

Recommendation: I do not support the above proposal and ask the CMP 17 to delete it. We opose the adoption of this proposal in any form.

Substantiation: Our opposition to this proposal is based on the following:

As a result of testing performed by manufacturers of Room Air Conditioners and testing at an independent laboratory with LCDI's in response to changes to the NEC in 2002, a number of disturbing facts about these devices have started to appear.

1. The maker of the code proposals 17-7 and 17-22 have stated to CMP-17 that LCDIs provide protection against wet environments and electric shock. Testing at an independent laboratory shows that LCDIs provide no real benefit to consumers regarding electric shock protection. Against wet environments or shock hazards, LCDI devices offer NO PROTECTION.

2. If an appliance were to be connected to an improperly sized (too small conductors) extension cord, the wires of the extension cord could melt and begin to ignite, but the LCDI device would not stop the fire. LCDIs provide no "upstream" protection. Use of improperly sized, cracked, frayed, or bare wires in extension cords would still be a hazard to consumers. Against this type of wiring hazard, LCDI devices provide NO PROTECTION.

3. If you cut the wires of an LCDI shielded cable with a knife when the cord set is not energized, and later return power to this device, the LCDI device will not open the circuit. Against this type of cord set fault, LCDI devices provide NO PROTECTION.

4. If you cut the wires of an LCDI shielded cable with a hacksaw when the cord set is not energized, and later return power to this device, the LCDI device will not open the circuit. Against this type of cord set fault, LCDI devices provide NO PROTECTION.

5. If you cut one of the connectors of an LCDI shielded cable with a pair of tin-snips when the cord is not energized, and later return power to this device, the LCDI device will not open the circuit. This type of cord set fault, LCDI devices provide NO PROTECTION.

6. Recent testing at manufacturers have shown that production quantity units of LCDI cord-sets, when connected to appliances, have shown numerous problems. Nuisance tripping of 50 percent of the samples in one life test module showed the LCDI device opened the circuit when the fan speed was changed from low to high. The housing covers of production units of LCDIs have opened up in tests. The test and reset actuators of LCDI's have failed to function. Components are still being added to printed wiring boards in these devices when manufacturers discover fault conditions. These devices are not at the stage of production viability.

7. Cord-set type AFCIs still do not exist. Some manufacturers have promised that these devices would be available in 2002 or 2003 but as of today, no production quantity AFCI's are listed by safety certification organizations and available for use by appliance manufacturers. This technology is not ready for usage by the fan or heater manufacturers. National Electric Code changes should not be made based on technologies that MIGHT be available at some future.

CMP 17 should reject these proposals immediately.

Panel Meeting Action: Reject

Panel Statement: The purpose of AFCI and LDCI is not to protect against electrocutions or line side extension cords.

Similarly, the purpose of AFCI and LDCI is not to protect against cutting conductors with knife, hack saw, or tin snips while they are deenergized but to protect against stray currents (i.e., arcing) after they have been cut or damaged.

Defects in some sample sets do not constitute substantiation of inadequate technology.

Evidence has been presented to the CMP to the contrary.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-69 Log #3264 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-69 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Joseph M. McGuire, Assoc. Home Appliance Manufacturers

Comment on Proposal No: 17-22

Recommendation: I do not support this proposal. We oppose the adoption of this proposal in any form.

Substantiation: Our opposition to this proposal is based on the following:

In April 2003 the US Consumer Product Safety Commission released a study of the economic analysis of replacing standard circuit breakers in houses with special AFCI circuit breakers. The study notes that there are an average of 41,500 residential fires involving electrical distribution systems over the last 9 years, with 326 deaths, 1,481 injuries, and 646 million in property loss. The report also notes that 85 percent of all such fires in the CPSC Epidemiological study involved housing over 20 years of age. At a recent CPSC hearing, speakers mentioned that the cost of retrofitting such breakers would be 20-30 dollars more than a standard breaker plus the cost of electrician services.

The study by Terrance Karels of CPSC concluded that even with the cost of replacement and estimating only 50 percent effectiveness and the time it would take to retrofit houses, the benefits to the United States would be greater than the cost.

If CMP 17 begins to require cord-connected AFCIs or LCDIs to individual appliances, the benefits of AFCI circuit breakers becomes less. This could cause the cost-benefit equation to tip in the other direction and raise significant

objections to the use or need for AFCI circuit breakers. If the economic cost were then to rise above the benefit, the US citizens may be deprived of the real benefits that panel-box mounted AFCI circuit breakers could bring to reducing home wiring fires, which are many times more prevalent than cord set related fires in a few appliances.

CMP 17 needs to review the actions they are taking not just in the narrow scope of whether this change is appropriate, but also as to what this action would mean to the greater acceptance of AFCIs in home wiring.

The answer is not to require cord-connected AFCIs or LCDIs but to work together on the technology and acceptance of circuit breaker AFCIs to protect all downstream electrical distribution applications.

Panel Meeting Action: Reject

Panel Statement: The substantiation does not support deletion of the proposal.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-70 Log #3272 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-70 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Lawrence Wethje, Association of Home Appliance Manufacturers

Comment on Proposal No: 17-22

Recommendation: We oppose the adoption of this proposal in any form.

Substantiation: Our opposition to this proposal is based on the following:

The proponent of this proposal, Mr. Chase, has included as technical substantiation synopses of several CPSC In-Depth Investigation reports. Unfortunately, the synopses that Mr. Chase conducted neglected to mention many important facts about each of these cases. For example:

900514CCC3423 - The details fail to mention that the consumer said the plug was "somewhat frazzled" but the homeowners continued to use the appliance without repairs.

900712CCC1548 - The details fail to mention that the investigator found beading on the wires, which according to NFPA 921, is a sign of damage after the fire, not the cause of the fire.

910508CCC1476 - The details fail to mention that the fire investigator found the motor of the fan frozen. Cord mounted AFCIs or LCDIs would have no effect on a fire originating from a burned motor.

910919CWE5013 - The synopsis of Mr. Chase fails to mention that the consumers had reported prior problems with the receptacle where the fan energized. They also reported the fire originated in the receptacle, not the fan.

931027CCC1047 - The synopsis mentions that the fire investigator found beading on the wires, which is a result of the fire, not the cause. In addition, the fan was discarded prior to the fire investigation.

940630CCN1825 - The synopsis fails to mention that the consumer had taped many black plastic trash bags to the walls of the room in the mobile home. The fire inspector reported the point of origin was the receptacle, not the fan.

940916CCN2367 - The synopsis of Mr. Chase fails to mention that the fire report says the cause was a short in the motor.

950811CCC1917 - The synopsis fails to mention that the fire report shows the cord, plug and receptacle were stressed by having the bedroom dresser placed against the appliance plug. In these situations, the receptacle is often damaged and is the point of origin of the fire.

950906CCC2955 - The Insurance investigator said, "there is no physical evidence to indicate that the failure of the fan contributed to the cause of the fire." This was left out of Mr. Chase's synopsis.

960726CNE5188 - The engineering report says the fire originated in "internal wiring" not in the cord set. Mr. Chase left this out.

980729CNE5211 - The fire investigation report states that the fire originated in an ice machine, not the fan. Mr. Chase left this out.

These are just a few examples where Mr. Chase has failed to give the Code Panel the full extent of the information on the fire incidents or failed to explain that the fire investigation report can often show alternative causes.

The Code Making Panel should not be making decisions based on a synopsis of fire investigation reports written by the code proposal proponent.

A comprehensive evaluation of fire incidents by Heiden Associates for the Association of Home Appliance Manufacturers concludes that the makers of these code proposals grossly exaggerated the number of incidents they attribute to problems in the power cords on fans and heaters. Far more evidence is available to show that faulty receptacles and house wiring are the cause of wiring related fires. The Code Panel should reject these proposals when presented with such erroneous evidence.

Panel Meeting Action: Reject

Panel Statement: U.L. has provided substantiation that some fires could have been prevented by a requirement for AFCI and LCDI devices.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-71 Log #3466 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-6 and Comment 17-71 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Jack Wells, Pass & Seymour/Legrand

Comment on Proposal No: 17-6

Recommendation: Continue to Accept in Principle in Part, but revise as follows by deleting (3) as shown:

Add new paragraph to Part II of Article 422 as follows:

422.16(B)(4) Cord and Plug Connected Vending Machine. Cord-and-plug connected vending machines shall be one of the following:

(1) For new and remanufactured machines ground-fault circuit-interrupter protection for personnel shall be factory installed, and shall be an integral part of the attachment plug or be located in the power supply cord within 300 mm (12 in.) of the attachment plug.

(2) Listed vending machines identified as incorporating a system of double insulation.

~~(3) Vending machines shall be connected to a circuit protected by a ground-fault circuit-interrupter.~~

Substantiation: We support the Panel Action to delete the second sentence of (1) as proposed for the reason given in the Panel Statement.

We believe (3) of the Panel Recommendation, which appeared as the last sentence of the submitter's proposed (1) should also be deleted. Vending machines are moved within customer facilities and from one customer to another on a regular basis. In order to comply with (3) the customer or vending machine supplier would need to install or have an electrician install a GFCI to protect any vending machine receptacle if the one to which the vending machine was to be plugged was not so protected. It is very unlikely that an electrical permit would be taken out. Therefore, this requirement is virtually impossible to enforce. The consequence is that it simply will not be done, but vending machine manufacturers will jump at the loophole and simply mark their unprotected machines "connect to a GFCI protected receptacle". This will circumvent the entire objective of this proposal.

We believe the data supporting this proposal is powerful and merits a clear unambiguous requirement that can not be easily circumvented.

Panel Meeting Action: Reject

Panel Statement: It is the intent to have all cord-and-plug-connected vending machines protected by a GFCI. See panel action and statement on Comment 17-3.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 7 Negative: 4

Explanation of Negative:

CRIPPS: See my explanation of negative vote on Comment 17-3.
HIRSCH: See my Explanation of Negative Vote on Comment 17-3.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

17-72 Log #3467 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-72 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Jack Wells, Pass & Seymour/Legrand

Comment on Proposal No: 17-22

Recommendation: Accept this proposal in principle and combine with a similar action on Proposal 17-7 to read as follows:

422.16(B)(6) Electric Fans and Space Heaters. All single-phase, cord-and plug-connected electric fans and space heaters shall be provided with factory-installed LCDI or AFCI protection. The LCDI or AFCI protection shall be an integral part of the attachment plug or be located in the power supply cord within 300 mm (12 in.) of the attachment plug.

Substantiation: The data supporting the proposal was, we believe, clearly attributed to independent credible sources and was accurately presented. Negative votes should be held to the same standard of credibility. It is not acceptable to simply dismiss the fire data presented as "questionable fire incident data". Credible analysis of the data or contradictory data (preferably from independent credible sources) is the least the submitter has the right to expect.

The negative comment (found in the panelists negative vote on Proposal 17-7 as referenced in the negative comment on 17-22) that "only a small portion (of the fires) involve arcing" is unsupported by any documentation.

The proposal is clear in identifying the product to be protected as single-phase cord-and-plug connected fans. Bathroom, range hood and other fans cited do

not fall into this category and the rationale for rejecting based on other types of fans not meeting this description is irrelevant.

Pass & Seymour/Legrand supports the philosophy that the NEC should not contain detailed product standards. However, we believe that the NEC must provide the foundation on which standards can be developed and, indeed, it does so in many areas. Placing a limited number of fundamental product requirements in the NEC does not weaken the "systematic integration of the NEC into the electrical safety system", it is an essential element of it. The NEC requires portable or movable signs to have factory installed GFCI protection [600.10(C)(2)], attachment plug caps for mobile homes to be of a specific NEMA configuration [550.10(C)], and numerous examples in addition to those cited by the submitter in the proposal substantiation. The LCDI/AFCI requirement for cord connected air conditioners is but one of many cited by the submitter. Standards Developing Organizations then use these foundation requirements and build them into their comprehensive product standards. In fact, standards developers have frequently told manufacturers that inclusion in the NEC is a prerequisite to coverage in a product standard. You can't have it both ways. The NEC can and must establish fundamental product requirements.

The fact that product standards committees are studying the problem does not appear to be a compelling reason for rejecting the proposal. The data presented covered over ten years of incident reports, ample time for the product standards committees to be aware of the problem and respond to it.

One negative comment referenced the panelists comment on Proposal 17-6. The relevance is certainly a stretch since that comment suggested requiring GFCI protection of the receptacle. In any case, the reason for voting negatively is seriously flawed. There are 100 million existing dwellings in this country and only 1.5 million homes built each year. The vast majority of residential fires are in older homes in poor areas, both urban and rural. Indeed, new homes are the place least likely to have a proliferation of cord connected heaters because they generally have adequate insulation and heating systems. Thus, the rationale of the negative completely misses the target of the proposal. The proposal is properly targeted at the portable cord connected space heater which is most frequently used in older homes in poor areas and are moved from room to room where retrofitting (AFCIs) is not required, not enforceable and highly unlikely to ever happen.

The explanation of the abstention is an appropriate comment in so far as it indicates that the panelist needed additional time to "scrutinize" the data. It would be appropriate that the results of this further analysis be available for discussion by the Panel and published as part of any panel statement, negative vote or abstention. While we agree philosophically that the NEC should not serve as a product standard, we further believe as discussed above, that it is essential for the NEC to continue to mandate fundamental product requirements.

We appreciate the opportunity to participate through the comment process. We have endeavored to respond to each of the reasons cited for negative votes or abstentions and strongly encourage the panel to accept the increased protection in fire safety that will be afforded by this proposal.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-4 and Comment 17-46.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-73 Log #3471 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-73 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Larry Albert, Black & Decker
Comment on Proposal No: 17-22
Recommendation: Black & Decker opooses the adoption of this proposal in any form.
Substantiation: a. From our analysis of the UL report of the CPSC related incidents involving fans and heaters there appears to be minimal statistical benefit for requiring these devices on the power cords on the indicated appliances.

b. There is no proven track record regarding these devices in cord installed applications and sparse field data regarding their efficacy in receptacle installations. Consideration of any benefits should wait until sufficient field information is available regarding receptacle installations.

c. There is an increased risk of electric shock in the case of LCDIs which have cords with energized outer braids. This is particularly troubling considering that many of the cords involved in the CPSC related incidents were found to have worn insulation. The increase in shock and electrocution is a very real anticipated effect of the use of LCDI that is not offset by the anticipated low probability of fire reduction.

d. The safety requirements regarding appliances should be left to those bodies, already in existence, that are committed to developing requirements for those appliances. These bodies (e.g. UL STPs) have a broad composition of participation that permits them to consider all factors in adopting new requirements, especially those that may mitigate safety benefit.

Panel Meeting Action: Reject
Panel Statement: The substantiation provided is not adequate to substantiate the proposal.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5._

17-74 Log #3483 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-74 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Lee Crawford, The Holmes Group
Comment on Proposal No: 17-22
Recommendation: We oppose the adoption of this proposal in any form.
Substantiation: The substantiation accompanying the original proposal outlines the risk of fire injury and death presented by portable electric space heaters and portable electric fans. This proposal maintains that damaged power supply cords account for the majority of fires involving short circuit, ground faults and electrical failure other than short circuit.

Furthermore, the proposal claims the use of in-cord LCDI or AFCI protection will eliminate the source of ignition in the majority of these fires. The use of GFCIs or ALCIs may have benefits associated with a reduction in shock hazard. However, our experience indicates that of the few faults that occur within a household appliance, cord-connected LCDIs and AFCIs will likely have very limited value in preventing fires. As of today, in-cord AFCIs still do not exist. Manufacturers have little or no experience with this type of technology and therefore claims of reduction of fires are without merit.

LCDIs and AFCIs offer no protection from high resistance or glowing connections within the receptacle or the appliance. Neither the LCDI nor the AFCI is intended to detect glowing connections from resistance heating. For such detection to occur, the glowing connection would need to arc or to leak in order to be detected. LCDIs are limited to only supplying protection to the power cord between the plug and the product. They provide no protection inside the appliance. These devices may actually contribute an added fuel load to an open flame raising the temperature and prolonging the duration of such an event. In addition, these devices provide no protection against miswiring, poor connections, or broken terminals inside receptacles or extension cords where real protection is needed.

For the above reasons, these devices are far less suited to reducing fire hazard than related products are to reduce sock hazard. Accordingly, we oppose the addition of cord-connected LCDIs and AFCIs to portable electric space heaters and portable electric fans.

Panel Meeting Action: Reject
Panel Statement: The substantiation provided is not adequate to substantiate the proposal.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-75 Log #3668 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-75 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: John Seaman, Bemis Manufacturing Company
Comment on Proposal No: 17-22
Recommendation: Proposed new text recommends the installation of LCDI and AFCI protection devices incorporated in the power cord or attachment plug of Electrical Fans. We oppose the adoption of this proposal and request the proposal be withdrawn. Further study must demonstrate effectiveness of the proposed devices, which are currently only in concept and development.
Substantiation: While AFCI receptacles have been mandated for bedroom use by the NEC, the successful use of these devices for small portable appli-

ances has not been proven effective. This type of product is not yet commercially available for manufacturers to determine acceptability in their products. Portable cord or plug attachment LCDI and AFCI devices used with heaters must be thoroughly tested and proven to withstand the use conditions they will be exposed to. There is also no guidance presented as to how a manufacturer is to select between the recommended devices. The successful application of these devices depends upon different technology, and our concern lies with potential undesirable results if applied improperly or not tested thoroughly.

The proposed devices may be susceptible to nuisance tripping arising from voltage and current spikes common in residential electrical supplies. If this happens during routine operation of the product, consumers may remove the device, thus leading to increased risk through improper repair, or by bypassing the intended protection. The construction of LCDI devices utilizes a sheath to sense fault conditions. This may lead to premature failure of the operation of the device as portable appliance cords are flexed.

Neither the LCDI of AFCI will react to series high-resistance arcing faults within the product, such as glowing connections or arc-tracking on component surfaces. These types of faults are a potential cause of ignition.

An independent technical analysis of LCDI and AFCI devices indicates their life expectancy may be shorter than the expected product life of heaters. When such a device fails, it may fail safe, but without indication it is not functioning. This could result in user false security. The device may also fail in a manner that is not safe. We have not seen data to support the fail-safe operation of such devices.

Panel Meeting Action: Reject

Panel Statement: At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The purpose of AFCI and LDCI is not to protect against high resistance connections.

The substantiation is not adequate.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-76 Log #3699 NEC-P17 **Final Action: Reject**
(422.16(B)(4))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-76 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Larry Johnson, National Presto Industries Inc.

Comment on Proposal No: 17-22

Recommendation: We oppose the adoption of this proposal in any form.

Substantiation: Incorporating a device that is electronic into a very simple, reliable product (portable air heaters) greatly concerns manufacturers, and may be a concern for the customer, in terms of function and reliability. National Presto and other AHAM members have been able to review a draft report from a recognized independent laboratory on the background and testing of current available devices. This report considered the limitations, failures, and the potential hazards of LCDI and AFCI devices.

The report listed 14 key conclusions. Here are a few that concern us:

° AFCIs and LCDIs are different devices that have limited response to various hazard conditions. This would mean that adding one of these devices would, at best, protect against only one type of hazard, if it added protection at all.

° Neither LCDIs nor AFCIs offer protection from high resistance or glowing connections within receptacles or extension cords. These are common faults that are reported in incident reports.

° The magnetic trip mechanisms of AFCI and LCDI devices make them susceptible to mechanical abuse nuisance tripping. This could be a source of customer complaints and/or returns or even customer action to disable the device.

° Overvoltage events that are harmless to most appliances can cause immediate failure of LCDI devices in a sometimes violent manner. This too could be a source of customer complaint, a hazardous situation, and/or return.

We encourage Code Making Panel 17 to reject the proposal to require AFCIs and LCDIs on air heaters. The devices have the potential to decrease reliability and add hazards to a product that is basic and has been a part of everyday life for decades. Additionally, at this point in time, one of the devices (the cord connected AFCI) does not exist and therefore, is not available for testing to show whether it will offer protection of any degree.

Panel Meeting Action: Reject

Panel Statement: The purpose of AFCI and LDCI is not to protect against high resistance connections.

At least one large manufacturer is presently providing LCDIs on all their electrical heaters.

The substantiation is not adequate.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-77 Log #1280 NEC-P17 **Final Action: Reject**
(422.16(B)(5))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-77 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Aaron B. Chase, Leviton Mfg. Co. Inc.

Comment on Proposal No: 17-7

Recommendation: Reject Panel Action. Accept Proposal as modified by Panel.

Substantiation: See my substantiation for my Comment on Proposal 17-22. The only variation for this Proposal is the UL study confirmed 7 incidents that LCDI or AFCI protection would have prevented which based on the sampling criteria correlates to 42 incidents. Again, the omission of spliced cords is a serious flaw in the study and diminishes the actual amount of fires that could be prevented.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 17-4.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-78 Log #1352 NEC-P17 **Final Action: Reject**
(422.16(B)(5))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-78 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Anthony Pulsonetti Glen Head, NY

Comment on Proposal No: 17-7

Recommendation: Reject the Panel Action and Accept the proposal as modified by the Panel.

Substantiation: The Panel members that voted in the negative stating that this should be addressed in the product standard and not the installation Code are wrong. The NEC Article 422 covers appliances used in an occupancy. Should we delete the entire Section 422 with this logic? Many lives have been saved by the adoption of 422.41. The Proposal, in essence, is the same as Section 422.41 except it is requiring a different technology to prevent against a different hazard, namely electrical fires. Please incorporate these safety devices so that lives are spared.

Panel Meeting Action: Accept in Principle

Panel Statement: See panel action and statement on Comment 17-4.

Number Eligible to Vote: 11

Ballot Results: Affirmative: 5 Negative: 6

Explanation of Negative:

CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.

Comment on Affirmative:

YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-79 Log #2847 NEC-P17 **Final Action: Reject**
(422.16(B)(5))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-79 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.

Submitter: Edward A. Schiff, Technology Research Corp.

Comment on Proposal No: 17-7

Recommendation: The CMP should accept in principle in part with the panel's recommended editorial revision.

Substantiation: The submitter wishes to express his appreciation to the members of CMP 17 for their time and consideration and also recognize the efforts of Underwriters Laboratories for taking the initiative and time to provide the CMP with additional data.

The UL evaluation of the CPSC-in depth investigations provides a random sampling of events. Of the 464 investigations, 242 were not applicable and

90 had insufficient data to determine the cause. This leaves us with a random sampling of 132 incidents for evaluation. Of the 132 incidents, 25 non-spliced cord fires were evaluated. It was determined that 11 would have been prevented, 7 events were unsure if LCDI/AFCI would have been prevented and 5 there was insufficient information to determine the affect of the added protection. The study did not include spliced cords which the submitter feels is an error. "Spliced" is an undefined term that includes incidents where damaged insulation is taped and the likely reason for splicing a cord is cord damage. Spliced cord incidents would in many cases be eliminated by these technologies.

According to the NFPA's Home Heating Fire Patterns and Trends, portable electric space heaters caused 2,800 fires which resulted in 48 deaths, 185 civilian injuries and $69 million in property damage in 1999. Based on the data provided in the random sampling from the UL report (13.5% of the yearly total), 52 unspliced cord fires occur each year that would be prevented by AFCI or LCDI protection. An additional 30 unspliced cord fires might be prevented and 37 events are undetermined. Obviously, a serious problem does exist that can be prevented even without incorporating sliced cords.

The original proposal highlighted multiple deaths that have occurred because of heater cord fires. The following are additional incidents including fatal fires:

Date	Location	Source	Comments
8/16/03	Auburn, N	Union Leader	Electrical cord sparked, 50 year old woman died
4/2/03	Lake Wales, FL	Tampa Tribune	Bad heater cord, 51 year old woman died
3/14/03	Mount Lebanon, PA	Pittsburgh Gazette	Post Cord on portable heater ignited apartment building fire
3/14/03	Denison, IA	Denison Review	Overheated heater cord ignited clothing
2/24/03	Canton, OH	Canton Repository	Heater Electrical Cord overheated, $35K in damage
1/22/03	Georgetown, DE	Sussez Countian	Overheated supply cord, $65K

Two of the panel members expressed that this was a product standard issue. There are a number of past precedents for incorporation into the code as cited in the original proposal. CMP 17 has taken action to improve the safety of vending machines because of the obvious hazard and two deaths that have occurred. This appliance has far more incidents of preventable problems and associated deaths. The technology has been incorporated for the past three years on every Black and Decker® heater manufactured. It is proven, economical and will reduce fires and needless deaths.

Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-4.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-80 Log #3269 NEC-P17 **Final Action: Reject**
(422.16(B)(5))

Note: The Technical Correlating Committee directs that Proposal 17-7 and Comment 17-80 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Livingston Reynolds, Texas Instruments, Incorporated
Comment on Proposal No: 17-7
Recommendation: This proposal should be accepted in principle in part as originally recommended by the panel.
Substantiation: The panel should reconsider the action taken on the original proposal. Many of the arguments against acceptance suggest that the responsibility for product safety lies in the individual product standard under the jurisdiction of UL. There is established precedent, not only in the case of AFCI/LCDI protection for room air conditioners, but also for dishwashers, trash compactors, vending machines, and disposals, to put safety measures in place in the Code. The justification submitted with the original proposal clearly establishes a benefit to society. Waiting for additional "examination and analysis of any evidence of deficiencies" or leaving the choice to consumers for "add-on" or supplemental protection will stall further development and deployment of this important life-saving safety technology.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-4.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my explanation of negative vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-4.

17-81 Log #3271 NEC-P17 **Final Action: Reject**
(422.16(B)(5))

Note: The Technical Correlating Committee directs that Proposal 17-22 and Comment 17-81 be reported as "Reject" because less than two-thirds of the members eligible to vote have voted in the affirmative.
Submitter: Livingston Reynolds, Texas Instruments, Incorporated
Comment on Proposal No: 17-22
Recommendation: This proposal should be accepted in principle as originally recommended by the panel.
Substantiation: The panel should reconsider the action taken on the original proposal. Many of the arguments against acceptance suggest that the responsibility for product safety lies in the individual product standard under the jurisdiction of UL. There is established precedent, not only in the case of AFCI/LCDI protection for room air conditioners, but also for dishwashers, trash compactors, vending machines, and disposals, to put safety measures in place in the Code. The justification submitted with the original proposal clearly establishes a benefit to society. Waiting for additional "examination and analysis of any evidence of deficiencies" or leaving the choice to consumers for "add-on" or supplemental protection will stall further development and deployment of this important life-saving safety technology.
Panel Meeting Action: Accept in Principle
Panel Statement: See panel action and statement on Comment 17-46.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 5 Negative: 6
Explanation of Negative:
CRIPPS: See my Explanation of Negative Vote on Comment 17-15.
CRIVELL: See my explanation of negative vote on comment 17-4.
HIRSCH: See my Explanation of Negative Vote on Comment 17-4.
HUTCHINGS: See my explanation of negative vote on Comment 17-20.
KOESSEL: See my Explanation of Negative Vote on Comment 17-4.
SARDINA: See my Explanation of Negative Vote on Comment 17-6.
Comment on Affirmative:
YASENCHAK: See my explanation of affirmative vote on Comment 17-5.

17-82 Log #1039 NEC-P17 **Final Action: Accept**
(422.18)

Submitter: Noel Williams, Noel Williams Consulting
Comment on Proposal No: 17-23
Recommendation: This proposal should continue to be accepted.
Substantiation: This proposal clarifies a significant issue - that direct support from the structure is permitted for smaller fans and that special boxes are not required. The special boxes are not useful in many applications. This change also makes appropriate support mandatory by specifying the permitted means of support and requiring one of them. The simplification mentioned in the substantiation is also sufficient reason for making this change.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-83 Log #1591 NEC-P17 **Final Action: Reject**
(422.31)

Note: The Technical Correlating Committee directs that this Comment be reported "Accept" to correlate with the action taken by Code-Making Panel 11 on Comment 11-42.
Submitter: Alan Manche, Schneider Electric/Square D Co.
Comment on Proposal No: 17-24
Recommendation: The panel should reconsider proposal 17-24 and accept in principle using the wording suggested by Mr. Wright in his negative comment found in proposal 11-67 as follows:

The provision for locking or adding a lock to the disconnecting means shall be ~~permanently~~ installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed.

Substantiation: Mr. Dollard's concerns for proposing the wording change to this section are well founded and needed in order to address the use of portable devices. However, the word "permanently" continues to receive a variety of interpretations by the inspection community across the country in the 2002 NEC 430.102(B). The most extreme example is the installation or removal of such a lockout device by a tool is not interpreted as being permanent. Using such logic would say that the entire panelboard mounted on the wall is not permanent as it could be removed using a tool. The proposed wording change by Mr. Wright in proposal 430.102(B) preserves the enforceable text for the inspector, addresses Mr. Dollard's concern, and clarifies the requirement for the lockout means to remain in place at all times.

Panel Meeting Action: Reject
Panel Statement: OSHA mandates a permanent locking device.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
ROCK: NEMA agrees with the submitter's Substantiation and notes that by not Accepting this Comment, CMP-17 has created a correlation issue with similar language in 430.102 Accepted by CMP-11.

17-84 Log #1142 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: Paul Dobrowsky Holley, NY
Comment on Proposal No: 17-24
Recommendation: Continue to accept the proposal.
Substantiation: Requiring a permanent provision for applying a lock will enhance safety at minimal expense. Many existing disconnecting means incorporate a permanent lockable means. Others have identified accessories that make the device lockable. Device manufacturers have accessories that can easily be installed at snap switch locations. Although poor work practices, such as applying tape over a switch or circuit breaker handle, are not a positive means of isolating a circuit or equipment, this method is (unacceptably) used too often. No single "aftermarket" accessory is available for applying to all types and ratings of disconnecting means. An individual servicing or maintaining equipment should be able to easily apply a lockable means to prevent injury or death.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-85 Log #1361 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: Andre R. Cartal, Princeton Borough Building Dept.
Comment on Proposal No: 17-24
Recommendation: The panel should continue acceptance of this proposal.
Substantiation: From the inspector's viewpoint, this proposal will make our job easier as we will have the locking means installed for the inspection. All of the circuit-breaker manufacturers list a locking means identified for the purpose in their catalogs. These items are installed on the breaker and secured by the panel trim.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-86 Log #1980 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: James T. Dollard, Jr., IBEW Local 98
Comment on Proposal No: 17-24
Recommendation: Continue to accept.
Substantiation: This proposed change is necessary to clarify the original text of this section. The present text of 422.31(B) reads as follows:
422.31(B) Appliances Rated Over 300 Volt-Amperes or Horsepower. For permanently connected appliances rated over 300 volt-amperes or hp, the branch-circuit switch or circuit breaker shall be permitted to serve as the disconnecting means where the switch or circuit breaker is within sight from the appliance or is capable of being locked in the open position.
Note that the requirement is based upon the capability of the switch or circuit breaker to be "locked in the open position." The additional text accepted in proposal 17-24 clarifies that the device is "capable of being locked in the open position" by requiring the device be independently capable of accepting a lock. This proposal does not represent an economic hardship on an owner or an installer. Disconnect switches with permanent means for locking in the open position are readily available. Accessory devices for circuit breakers are also readily available from all circuit breaker manufacturers.
Good code is practical, easy to read and enforceable. It is practical to clarify this safety driven requirement. The accepted text is easy to read and apply. This proposal is necessary for the enforcement community as the inspector will be able to visually see the capability of a switch or circuit breaker to be "locked in the open position."
Installers/Maintainers, manufacturers & owners of appliances will all benefit from a safer electrical installation allowing the application of a lock to prevent injury and/or death to all persons servicing, installing or maintaining large appliances.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-87 Log #2916 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: David H. Kendall, Carlon
Comment on Proposal No: 17-24
Recommendation: Continue to Accept.
Substantiation: This proposed change is necessary to clarify the original text of this section. The revised language will insure the safety of the electrical contractor.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-88 Log #2951 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: Michael J. Johnston Plano, TX
Comment on Proposal No: 17-24
Recommendation: This proosal should be accepted.
Substantiation: The revision would provide consistency in the use of the term and concept of "capable of being locked in the open position" as it appears in at least 25 sections of the NEC. If there are different requirements relative to the acceptable lockable means and methods between each of those sections, it promotes inconsistent application in installations and inconsistent enforcement. Where this term appears in the NEC all the provisions should be the same because the hazard is the same and this will have a positive impact on safety for industry workers.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-89 Log #3226 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 17-24
Recommendation: Continue to accept this proposal.
Substantiation: This safety driven proposal will provide clarity, usability and uniform enforcement of the present requirement in 422.31(B).
Switches providing permanent provisions for adding a lock are readily available without additional cost to the installation. Accessory devices, adding permanent provisions for a lock are inexpensive and readily available for circuit breakers. We agree with the substantiation of the submitter and the safety driven action of CMP-17 to accept this proposal.
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

17-90 Log #3316 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: John W. Young, Siemens Energy & Automation
Comment on Proposal No: 17-24
Recommendation: Revise the proposed sentence as follows:
The provision for locking or adding a lock to the disconnecting means shall be ~~permanently~~ installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place ~~at all times~~ with or without the lock installed.
Substantiation: The intent of the proposal is that the locking means is always present at the switch or circuit breaker whether the lock is present or not. There is no disagreement with that but the wording introduces a problem that needs to be addressed. This same requirement was added to 430.102(B) in the 2002 NEC and the word "permanent" is creating problems.
"Permanent" in the wording is used to mean that the locking means is always present and not removed when the lock is removed. Some AHJs, however, are reading this to mean it shall not be possible to remove the locking provisions, i.e. that once the means are installed it is not possible to remove it, and they are evaluating the degree of difficulty in removing the locking means as whether the Code is complied with not.
Changing the words as indicated clearly states the intent and removes the problem with "permanent".
The same change is being requested for 430.102(B).
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 17-83.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 10 Negative: 1
Explanation of Negative:
ROCK: See my Explanation of Negative Vote on Comment 17-83.

17-91 Log #3347 NEC-P17 **Final Action: Accept in Principle**
(422.31(B))

Note: The Technical Correlating Committee directs that this Comment be reported as "Accept in Principle". See the Technical Correlating Committee action on Comment 17-83.
Submitter: Daniel R. Neeser, Cooper Bussmann
Comment on Proposal No: 17-24
Recommendation: The panel should continue to accept the proposal.
Substantiation: This proposal represents a serious safety issue. The addition of "permanently installed" for the locking of the disconnecting means provides the needed language to assure worker safety after installation of the equipment. If this language is not included, unsafe lockout devices could be used and jeopardize safety.
Panel Meeting Action: Accept
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-92 Log #452 NEC-P17 **Final Action: Reject**
(422.33(A))

Submitter: Dan Leaf Rancho Santa Margarita, CA
Comment on Proposal No: 17-25
Recommendation: Accept the proposal.
Substantiation: The first sentence in (A) states an accessible connector or plug/receptacle (per Article 100 "capable of being removed or exposed...not closed in by a structure or finished of the building") shall be permitted. The second sentence states "where...not accessible (closed in by the structure or finish of the building)". The wording infers that separable connectors and plugs/receptacles means of connections are permitted to be closed in by the structure or finish of the building.

Receptacle boxes and cords are not permitted to be concealed (not accessible) by 314.29 and 400.8, though they may be accessible but not readily accessible. The panel reference to 422.16(B) is not accurate. Cord and plug/receptacle connections for disposers, dishwashers, compactors are normally located under a sink which has readily accessible space. Where the cord and plug/receptacle are not readily accessible (such as within the space for a wall mounted oven) an additional disconnect means is not required. A disconnect in accordance with 422.31 is required unless the oven has unit switches per 422.24 which is doubtful since ungrounded conductors to clock timers are not disconnected by unit switches.
Panel Meeting Action: Reject
Panel Statement: Plugs and receptacles are not considered to be readily accessible (capable of being reached quickly for operation without removing the appliance) but are accessible (when the appliance is removed from its location). The suggested change would require an additional disconnecting means for these appliances.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

ARTICLE 424 — FIXED ELECTRIC SPACE-HEATING EQUIPMENT

17-93 Log #3200 NEC-P17 **Final Action: Accept**
(424.6)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 17-32
Recommendation: The panel should accept this proposal.
Substantiation: According to the NFPA, Portable and Fixed area heaters caused on an average 290 deaths and 635 injuries for the years of 1994 through 1998. Therefore, I respectfully request that Code Making Panel 17 accept this proposal.

This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.
Panel Meeting Action: Accept
Panel Statement: The panel notes that the reference in the recommendation of Proposal 17-32 should be 424.6, not 426.6. This is considered an editorial correction.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-94 Log #1867 NEC-P17 **Final Action: Reject**
(424.12(B))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-33
Recommendation: Accept the proposal as written.
Substantiation: The submitter provided no substantiation to support a listing requirement. He provided substantiation in support of the term "identified". This is a defined term in Article 100 and does not mean marked in the conventional, dictionary sense of the term. It means recognizable as suitable for the use, and a listing may or may not be required for this purpose.
Panel Meeting Action: Reject
Panel Statement: Changing the word to "identified" would not change the intent of this section. The action of Comment 17-93 adds a requirement for listing and satisifies the concern.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-95 Log #1868 NEC-P17 **Final Action: Reject**
(424.13)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-34
Recommendation: Accept the proposal as written.
Substantiation: The submitter provided no substantiation to support a listing requirement. He provided substantiation in support of the term "identified". This is a defined term in Article 100 and does not mean marked in the conventional, dictionary sense of the term. It means recognizable as suitable for the use, and a listing may or may not be required for this purpose.
Panel Meeting Action: Reject
Panel Statement: See panel action and statement on Comment 17-94.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-96 Log #1869 NEC-P17 **Final Action: Reject**
(424.22(B) Exception (New))

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-36
Recommendation: The proposal should be accepted in principle. Revise as follows: "Listed instantaneous electric water heaters shall be permitted to have their loads subdivided in accordance with 422.11(F)(3)."
Substantiation: This is intended to be a permissive exception, and as such should be clearly stated. The proposal as written literally forbids listed water heaters to use the more conservative subdivision procedure mandated in the parent rule.
Panel Meeting Action: Reject
Panel Statement: The panel has reconsidered its original action on Proposal 17-36 in light of the information provided in the substantiation of Comment 17-97. In addition, the recommendation of Comment 17-96 is editorial in nature. See panel action on Comment 17-97.
Number Eligible to Vote: 11
Ballot Results: Affirmative: 11

17-97 Log #2861 NEC-P17 **Final Action: Accept**
(424.22(B) Exception)

Submitter: Todd F. Lottmann, Cooper Bussmann
Comment on Proposal No: 17-36
Recommendation: Reject this proposal and delete the proposed exception as sown in the NEC ROP draft.

~~Exception: Listed instantaneous electric water heaters shall have their leads subdivided as defined in Article 422-11(B)(3).~~
Substantiation: Without adequate technical substantiation to assure that the minimum level of safety required by this code will be maintained with this change, this proposal should be rejected. The submitter needs to provide facts, testing, or any form of technical justification to support this drastic of a change in protection. In addition, the submitter claims that "there is no technical or safety reason to limit the protection to 60 amperes or cause loads to be subdivided to 48 amperes". Understanding the consensus process used to govern this code, the technical justification the submitter is looking for was given when the 60/48A requirement was placed in the code. Therefore, the submitter needs to supply justification for changing from 60A to 150A, which was not provided.

The existing 60A subdivision requirements exist to reduce the risk of fire as the closer sizing of the overcurrent protective devices provides better overcurrent protection and minimizes the amount of damaging energy that is released into the heating elements. In addition, the subdivision provides the benefit of increased continuity of service as only the faulted element will be taken off line leaving the remaining elements operational.

Accepting this proposal would allow the overcurrent protection to be sized much larger and result in increased levels of damaging energy, without technical substantiation.

For example: Using the example provided in the substantiation, a comparison of the let through energy with the existing 60A requirement compared to that allowed by the proposed exceptions show the drastic difference that would be allowed by acceptance of this proposal. The example consists of an instantaneous water heater with four elements drawing 25A. As the submitter states, the overcurrent protection required with the existing language would require, four subdivided circuits protected at 30 amps each. This change would allow for a single circuit for all four elements protected at 125A. Comparing the let through limits for Class T fuses, as provided in the 2002 UL, white book, p. 53,

a 600V, 30A, Class T fuse could have a let through I^2t of 7,000 A^2 sec whereas a 600V, 125A, Class T fuse could be as high as 300,000 A^2 sec (based on 200A body size). This change, up to 150A overcurrent protection, would allow 42.86 times as much damaging energy to be let through compared to the exsiting requirement of up to 60A. This is a drastic difference and a definite decrease in the level of safety.

Another issue pointed out by the submitter regards a perceived advantage in disconnect requirements with this proposed change. There is no difference or added safety in the requirements for disconnecting means as 424.22(C) allows for more than one subdivided circuit to be provided with a single disconnecting means. Therefore, making the argument for ease of disconnection implied by the submitter is erroneous.

Given all the information provided above, this proposal should be rejected until such time that substantiation is given that proves there will be no reduction in safety.

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

ARTICLE 426 — FIXED OUTDOOR ELECTRIC DEICING AND SNOW-MELTING EQUIPMENT

17-98 Log #3199 NEC-P17 **Final Action: Accept**
(426.50(A))

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 17-39
Recommendation: Accept this proposal in principal and revise 426.50 to read as follows:

All fixed outdoor deicing and snow-melting equipment shall be provided with a means for disconnection from all ungrounded conductors. Where readily accessible to the user of the equipment, the branch-circuit switch or circuit breaker shall be permitted to serve as the disconnecting means. ~~Switches used as~~ The disconnecting means shall be of the indicating type and be provided with a positive lockout in the "off" position.

Substantiation: The submitter does raise a potential safety situation and we shouldn't need a body count before corrective action is taken. The submitter's additional information in this proposal about positive lockout provisions in 426.51(A), 427.55(A) and 427.56(A) and the lack of consistency is a valid argument for changing 426.50(A).

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: 10
Ballot Results: Affirmative: 10

ARTICLE 427 — FIXED ELECTRIC HEATING EQUIPMENT

17-2b Log #2446 NEC-P17 **Final Action: Accept**
(427.23)

Submitter: Wayne A. Williams, Tyco Thermal Controls
Comment on Proposal No: 17-51
Recommendation: This proposal should remian rejected. I support the panel's action on this proposal.
Substantiation: The term "conductive covering" does not restrict the use of metal braid or sheath.

The substantiation for the proposal is incorrect. Confusion about the use of the term "conductive covering" arose during the revision of IEEE 515. The issue of whether this term could be used was based on its potential of restricting product constructions because of the term's use in a product patent. A review of the patent reveals that the term "conductive covering" is never mentioned. Further, the issue of including this term in the IEEE 515 Standard was reviewed by the legal department of IEEE and was determined not to be an issue.

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

17-2c Log #2445 NEC-P17 **Final Action: Accept**
(427.23)

Submitter: Wayne A. Williams, Tyco Thermal Controls
Comment on Proposal No: 17-50
Recommendation: This proposal should remain rejected. I support the panel's action on this proposal.
Substantiation: The term "conductive covering" was specifically intended to cover the use of metal braid or sheaths.

The substantiation for the proposal is incorrect. While an issue of the use of the term "conductive covering" was raised during the revision of IEEE 515, the concern was whether this term could be used if it was covered by patent claims for a specific product. A review of the patent reveals that the term "conductive covering" is never mentioned. Further, the issue of including this term in the IEEE 515 Standard was reviewed by the legal department of IEEE and was determined not to be an issue. The inclusion of the proposed terms in the current draft of the IEEE, as referenced by the proposal, was decided before the full review of this issue was completed.

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

17-99 Log #1870 NEC-P17 **Final Action: Accept**
(427.27)

Submitter: Frederic P. Hartwell, Hartwell Electrical Services, Inc.
Comment on Proposal No: 17-53
Recommendation: Accept the panel action in principle. Conform the action to the Style Manual be restating the new provisions in the form of an exception, as follows:

Exception: In industrial establishments, the isolation transformer connected to the pipeline or vessel being heated shall be permitted to have an output voltage not greater than 132 volts ac to ground where all of the following conditions apply:

(1) Conditions of maintenance and supervision ensure that only qualified persons service the installed systems.

(2) Ground fault protection of equipment is provided.

(3) The pipeline or vessel being heated is completely enclosed in a grounded metal enclosure.

(4) The transformer secondary connections to the pipeline or vessel being heated are completely enclosed in a grounded metal mesh or metal enclosure.

Substantiation: The panel action created an industrial exception in the form of an orphaned, uncitable third paragraph that is in direct conflict to the other two paragraphs. This comment reformats the language into exactly what it is, an industrial exception. This comment also clarifies that the ground-fault protection being required is GFPE and not GFCI, which itself is another source of conflict with the other material in this section. There is no problem with the concept of the proposal but it must be presented in a way that will not confuse code users.

Panel Meeting Action: Accept
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Negative: 1
Explanation of Negative:
YASENCHAK: Further study and evaluation is required. Motor circuits should not be used as "an example of the safety considerations" that are being implemented. Motors have different types of protection, i.e., thermal, magnetic and in some cases GFI. I do not agree with the submitter's example. The original proposal is unique to heating equipment.

17-100 Log #3198 NEC-P17 **Final Action: Reject**
(427.27)

Submitter: Michael I. Callanan, IBEW
Comment on Proposal No: 17-53
Recommendation: This proposal should be rejected.
Substantiation: The substantiation for the proposal is to reduce "capital costs" and make this type of heating "more competitive". The intent of this Code is the practical safeguarding of persons and property from hazards arising from the use of electricity. No substantiation was submitted to demonstrate that what is proposed has been evaluated to meet the intent of this Code. Therefore, I encourage the panel to reject this proposal.

This comment represents the official position of the International Brotherhood of Electrical Workers Codes and Standards Committee.

Panel Meeting Action: Reject
Panel Statement: The change in the voltage limitations is appropriate, since the conditions under which it may be used provide adequate safety.
Number Eligible to Vote: 10
Ballot Results: Affirmative: 9 Negative: 1
Explanation of Negative:
YASENCHAK: See my explanation of negative vote on Comment 17-99.