



National Fire Protection Association

Electrical Engineering, 1 Batterymarch Park, Quincy, MA 02169-7471
Phone: 617-770-3000 • Fax: 617-984-7070 • www.nfpa.org

NATIONAL ELECTRICAL CODE© COMMITTEE

MEMORANDUM

TO: Members of Code-Making Panel 2

FROM: Jean O'Connor

DATE: June 1, 2004

SUBJECT: Ballot for Association Amendment to the 2005 Edition of NFPA 70,
National Electrical Code

At the 2004 May Technical Session, held May 26, 2004, NFPA 70 was amended by the acceptance of the following:

Amendment: Accept Comment 2-91 (Proposal 2-140)

In accordance with Section 4-6 of the Regulations Governing Committee Projects, the Code-Making Panel must now be balloted on the Association meeting action. The ballot has two parts. Part 1 relates to your acceptance or rejection of the amendment. Part 2 relates to the suitability of the resulting document should Part 1 not pass since the wording of that portion of the Report affected by the amendment would return to the text of the previous edition, if any. If there is no previous edition text, the text is simply deleted.

The definition of "suitable" as found in the NFPA Regulations Governing Committee Projects is as follows:

Suitable - as it pertains to determinations made by Technical Committees or Technical Correlating Committees in accordance with 4-6.1 and 4-6.2 of these Regulations means that the text of the Document amended as a result of Association or Subsequent Technical Committee and Technical Correlating Committee action is consistent in its recommendations, does not contain conflicts, is complete, and otherwise is editorially and technically adequate for use.

Please review this material, complete the ballot and return to NFPA so as to be received as soon as possible, but no later than June 18, 2004. If you disagree with the amendment or its suitability, or if you elect to abstain, please indicate your reason(s) for doing so.

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The transcript from the May Meeting will be available on June 7, 2004 at
<http://www.nfpa.org/Codes/TechnicalCommittees.asp>.

Note: Please remember that the return of ballots and attendance at Committee Meetings is required in accordance with Section 3-1.3.1 of the Regulations Governing Committee Projects.

CC: Ann Coughlin
Lynne Light
M.W. Earley
J.W. Carpenter

Panel Meeting Action: Reject

Panel Statement: See panel statement on Comment 2-107. The submitter has not provided data relevant to guest rooms of hotels and motels.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 12 Negative: 1

Explanation of Negative:

DOBSON: See my explanation of negative vote on Comment 2-107.

2-90 Log #103 NEC-P02
(210.12(A))

Final Action: Reject

Submitter: Dan Leaf Rancho Santa Margarita, CA

Comment on Proposal No: 2-231

Recommendation: Accept the proposal.

Substantiation: 424.3(B) requires branch circuit conductors and overcurrent devices rated at not less than 125 percent of the load. The reference in that section to continuous operation infers a continuous load. Present wording does not require the feeder or service conductors or overcurrent devices to be rated at 125 percent. If the 125 percent requirement is necessary for branch circuit conductors and overcurrent devices, it is necessary for feeder and service conductors and overcurrent devices.

Panel Meeting Action: Reject

Panel Statement: The submitter's substantiation does not relate to 210.12(A) or Proposal 2-231.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

2-91 Log #510 NEC-P02
(210.12(B))

Final Action: Reject

Submitter: Walter Smittle, National Association State Fire Marshals

Comment on Proposal No: 2-140

Recommendation: Revise to read as follows:

Dwelling Unit Bedrooms. All branch circuits that supply 125-volt, single-phase, 15- and 20-amperes receptacles outlets installed in dwelling-unit bedrooms all living areas shall be protected by an arc-fault circuit interrupter(s).

Substantiation: See substantiations for Proposal 2-140 (Log 1623) and Proposal 2-143 (Log 2364). The panel has concluded there is not sufficient data available to substantiate the reliability and effectiveness of this new device to justify the expansion. The NASFM disagree in that more than compelling data has been submitted to Code-Making Panel 2.

The Consumer Product Safety Task Force, National Association of State Fire Marshals (NASFM), published a comprehensive report on August 1, 2002 on the efficacy and reliability of arc-fault circuit interrupters. Electrical engineering experts for US Consumer Product Safety Commission, Underwriters Laboratories, Chair of NASFM Science Advisory Committee, SP Swedish National Testing and Research Institute, and many fire safety professionals reviewed and commented on statistics and data provided by numerous sources which supports the reliability and effectiveness of arc-fault circuit interrupter technology.

During the meeting of Code-Making Panel 2 in January 2003 at Hilton Head, SC, the validity of NFPA and NFIRS reports on electrical fires was questioned. NASFM subsequently contacted ten (10) State Fire Marshals and requested two reports on investigations conducted by professional staff fire investigators where a fatality or fatalities occurred in a dwelling. Copies of these investigative reports and a synopsis of the causation factors are provided. As a result of the findings by professional investigators, with years of experience and expert credentials in the State Fire Marshal's Offices, the information supports the data collected by NFPA and NFIRS. Fifty-two (52) adults and fourteen (14) children died in dwelling fires caused by electrical failures that AFCIs could have prevented as identified in these investigative reports. Other supportive information is included regarding Firefighter Wary after 2nd Blase at SE Site in southeast Washington caused by an electrical short for a new townhouse complex as well as Fire Investigation Summary of an Apartment Building Fire in Bremerton, Washington. This supportive information clearly supports the need for AFCIs.

The panel also recommended data on "beta testing" before considering expansion of AFCIs on all circuits. NASFM understands that "beta testing" occurs before manufacturers start production. These electrical safety devices are already on the market and nearly six million AFCIs sold. NASFM is not privileged to manufacturers "beta testing" data as it would be confidential. In Appendix 2 of the NASFM report, (History of AFCIs and Their Inclusion in the National Electrical Code), in March 1996, UL issued a Report of the Research on Arc-Fault Detection Circuits. Additionally, the devices have been tested as well as scrutinized by the US Consumer Product Safety Commission before AFCIs were approved for commercial use in 1999.

NASFM firmly believes there is overwhelming scientific and statistical evidence that disproves disclaimers of nuisance tripping and that adding AFCIs to new residences is a threat to affordable housing.

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

Panel Meeting Action: Reject

Panel Statement: The panel appreciates the level of protection provided by branch/feeder AFCI's. However, the panel wants to see the combination protection implemented before expansion beyond bedrooms. The submitter has provided comprehensive fire data; however, Panel 2, seeks to gain further information on the experience with the devices already in the field.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 9 Negative: 4

Explanation of Negative:

KING: This Comment should have been accepted. I concur with the panel that comprehensive fire data was provided and share the panel's appreciation for the high level of protection provided by these devices. The panel action on Comment CC200 recognizes and permits the use of combination devices while allowing for the continued use of branch/feeder devices until 2008. I disagree that more time is needed for implementation of combination devices. Combination devices are listed and commercially available. The need to expand AFCI protection in dwelling units is well documented. Studies conducted by the NASFM and the CPSC indicate that expanding the requirement for AFCI protection to all living areas this code cycle would save many lives and save millions of dollars in property loss.

PAULEY: NEMA supports the expansion of AFCI protection to other areas of the dwelling unit. The submitter submitted substantial data to support his position. Although the panel is seeking to gain additional field experience, the AFCIs already in the field have provided a great deal of information. NEMA is not sure what additional information the panel is seeking. Fire statistics will take years to show the benefit of the improved protection, and it is difficult to show cases where AFCIs are installed and prevented a fire because consumers do not report instances of "fires that didn't occur."

PORTER: The panel has been provided with data that shows that fires in kitchens, living rooms and other dwelling unit areas may be reduced by the use of AFCI devices. The existing branch feeder AFCIs have demonstrated their performance in the field. Since these devices will continue to be permitted until January 1, 2008, there is no need to postpone the expansion of AFCI into other circuits.

WEBER: After long debate and deliberation, the panel affirmed in its statement that it "appreciates the level of protection provided" by AFCI; but wants more time for input from the field. The expansion of this proven safety protection is certainly justifiable. The original proposal and supporting comment should be Accepted. Change occurs slowly and sometimes methodically, but the time lost and potential lives lost by not increasing the safety mandate is hard to explain to a person or family that has suffered a loss to life or property that could have been prevented as the substantiation has clearly indicated to me.

2-92 Log #515 NEC-P02
(210.12(B))

Final Action: Reject

Submitter: Richard E. Loyd Sun Lakes, AZ

Comment on Proposal No: 2-161

Recommendation: Reconsider this proposal and accept this proposal.

Substantiation: This proposal would permit the present technology to provide the safety needed in all residential occupancies while allowing the receptacle type AFCI in residential construction where metallic concealed wiring methods are used. This change is justified as the metallic systems will protect against common damage from nails and staples, and other damage that often occurs during the construction phase. The metallic system also aids to contain arcing that may occur if the conductors are damaged while providing a low impedance path for ground faults. Consideration should be given to Mr. Pauley's comments on his negative vote on Proposal 2-134a.

Panel Meeting Action: Reject

Panel Statement: Metal conduit is only one portion of the tradeoff versus location of the AFCI. The limited distance is also necessary.

Number Eligible to Vote: 13

Ballot Results: Affirmative: 13

2-93 Log #775 NEC-P02
(210.12(B))

Final Action: Accept in Principle

Submitter: Michael J. Johnston Plano, TX

Comment on Proposal No: 2-134a

Recommendation: Continue to accept this proposal.

This revision not only provides a clarification and guidelines for the product performance it also provides an alternative in the exception for remodels and alterations to existing dwellings that allows the AFCI protection to be applied where the service equipment and/or panelboard might otherwise have to be replaced to meet the current requirements of 210.12(B)

Substantiation: This revision not only provides a clarification and guidelines for the product performance it also provides an alternative in the exception for remodels and alterations to existing dwellings that allows the AFCI protection to be applied where the service equipment and/or panelboard might otherwise have to be replaced to meet the current requirements of 210.12(B)

Report on Proposals – May 2004

NFPA 70

2-140 Log #1623 NEC-P02
(210-12(B))

Final Action: Reject

Submitter: Walter Smittle, National Association State Fire Marshals**Recommendation:**

Revise text to read as follows:

210-12 Arc-Fault Circuit-Interrupter Protection.

(B) Dwelling Units Bedrooms. All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere receptacle outlets installed in dwelling unit bedrooms in all living areas shall be protected by an arc-fault circuit interrupter(s). ~~This requirement shall become effective January 1, 2002.~~

Substantiation:

The National Electrical Code since 1999 has required AFCIs for bedroom outlets. This restriction of limiting installation of these devices partially satisfies the intended protection of circuits supplying the dwelling. The National Association of State Fire Marshals endorsed this technology by Resolution at their Annual Meeting two years ago because this technology will reduce electrical fires and preserve life and property from electrical fires. To effectively enhance the safety benefits of AFCIs in dwelling units the expansion of the use of AFCIs will be necessary. With the extended coverage of AFCIs throughout the living areas of dwellings greater safety will be provided by eliminating electrical fires in other areas of the dwelling. This technology is the wave of the future and not extending the coverage with AFCIs is not keeping with the intent of NFPA codes by providing complete coverage for the homeowners and enhancing safety. Previous documentation has been submitted to the NEC Panel for review. This documentation includes the Consumer Product Safety Commission entitled "Preventing Home Fires: Arc-Fault Circuit Interrupters", Volume 4 #1, page 6, Summer 1999, that states this technology available today to be effective. Underwriters Laboratories has provided technical data that these devices will work and save lives. U.S. Fire Administration, Missouri Burn Center, NASFM, State Farm Insurance Safety Home program have published on their respective websites supporting the installation of AFCIs.

I have provided a copy of the National Association of State Fire Marshals Science Advisory Committee report on AFCIs. This report reviewed by scientists conclude that AFCIs work, are cost effective, and alleged statements that AFCIs will not function as intended or are too expensive is misrepresentation of the real facts regarding AFCI technology. Statements that fires are occurring in older or existing dwellings are factual. Fires are occurring in existing homes, but new homes are experiencing fires as well. Also, how do you keep a new home from becoming an existing or older home? All dwellings, new and existing, should require AFCIs in all living areas. The need and justification to expand the use of AFCIs is warranted. I pray the NEC Panel will expand the use of AFCIs and provide the best safety environment with a dwelling. The NEC Panel should not take the position of "wait and see attitude" on gradually increasing safety with AFCIs, but move forward in providing the best safety for the citizens throughout the countries using the NEC for electrical safety.

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

Panel Meeting Action: Reject**Panel Statement:**

With the introduction of the AFCI, the panel has concluded that there is not sufficient data available to substantiate the reliability and effectiveness of this new device to justify any expansion at this time. The dependability of this AFCI device in use in the public domain has not been determined, and the panel would seek sufficient data, including beta testing, before any potential expansion of the use of this device can be considered.

Number Eligible to Vote: 13**Ballot Results:** Affirmative: 10 Negative: 3**Explanation of Negative:**

BECKER: See my Explanation of Negative on Proposal 2-116.

PAULEY: The expansion of AFCI requirements to other locations in the dwelling would be a clear increase in electrical safety. AFCIs are effective and the submitter has presented opinions from fire-safety professionals that expansion of the requirement would have a positive impact on reducing fires of electrical origin.

WEBER: With the acceptance of Proposal 2-134a the panel, in my opinion, acted wisely and should be commended. In review of the reports presented by the National Association of State Fire Marshals and fire incidents, even though some may say they do not provide to their satisfaction the desired data, they do show causes of electrical fires. If we have in the electrical industries capability to decrease fire deaths and loss of property the sensible action should be to expand its use. We do not live in a perfect world and some times not all of the (i) are dotted and the (tt) crossed. As we have observed the evolution of the GFCI protection system and the life saving values provided, had it been held to the testing standard and documentation that AFCI are now being asked to meet, I feel we would not have the level of safety we have today. In my opinion, sufficient data and beta testing has been done and on file with manufacturers to warrant the expansion of this needed level of safety protection.

Comment on Affirmative:

PORTER: UL supports the panel action on this proposal because of the panel's acceptance of the combination type AFCI in 2-134a. However, the panel has been provided with data that shows that fires in kitchens, living rooms and other dwelling unit areas may be reduced by the use of AFCI devices. The existing branch feeder and outlet branch AFCIs have demonstrated their performance in the field. If these devices were to continue to be permitted in the 2005 Code, there would be no need to postpone the expansion of AFCI into other circuits.

**National Fire Protection Association**

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NATIONAL ELECTRICAL CODE© COMMITTEE

TO: Members of Code-Making Panel 2

FROM: Jean O'Connor

DATE: June 18, 2004

SUBJECT: Circulation of votes on the Amendment Ballot to Accept Comment 2-91

In accordance with the NFPA Regulations Governing Committee Projects, enclosed are copies of ballots indicating reasons for negatives, abstaining, and affirmative votes for the Amendment Ballot to Accept Comment 2-91. Reasons for negative votes, etc. from alternate members are not included unless the ballot from the principal member was not received.

The ballot results, prior to circulation, are as follows:

Accept Comment 2-91

12 Eligible to Vote

5 Affirmative

7 Negative (R. Becker, J. Wiehagen, R. Weber, J. P. Roche, A. Sidhom, M. Toman and R. Wilkinson)

Suitability

12 Eligible to Vote

6 Affirmative

6 Negative (R. Weber, S.W. Porter, A. Sidhom, M. Toman, R. Wilkinson, and J. Wiehagen)

IF YOU WISH TO CHANGE YOUR VOTE, THE CHANGE MUST BE RECEIVED BY NFPA BY 5 PM, EDT, ON OR BEFORE WEDNESDAY, JUNE 23, 2004. SUCH CHANGES SHOULD BE SENT BY FAX (617) 984-7070.

**C.C. Leona Nisbet
Lynne Winnett
Ann Coughlin
J. W. Carpenter**

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BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

☐ AGREE

☒ DISAGREE*

☐ ABSTAIN*

Part 2: With respect to the suitability** of the resultant text should the amendment not be agreed to, the text would be:

☒ SUITABLE

☐ UNSUITABLE*

☐ ABSTAIN*

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

SEE ATTACHED

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

3 PAGES

Signature: _____

Name - Please Print: _____

Date: _____

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BALLOT
NFPA 70 – ANNUAL 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Richard W. Becker - Reason for Disagree
June 18, 2004

I believe this proposal is an attempt to expand the requirements for AFCI to all of the lighting and receptacle branch circuits in a Dwelling. Proposal 2-140 refers to substantiation that is not conclusive. The research shows the device can work under very specific circumstances but does not demonstrate effectiveness on the majority of electrical incidences that produce ignition.

It is my position that substantiation still has not been provided that demonstrates that this technology can detect and prevent ignition in the "fires of electrical origin" that are being reported by fire investigators. A short circuit (parallel failure) in a cord or in premise wiring systems can absolutely cause ignition because of "burning" and "sparking", and will generally trip a standard overcurrent device, but after ignition has occurred! The AFCI does not detect this condition. A severed conductor or loose connection (series failure) can cause ignition by producing heat, "joule heating", adequate to produce a visible "glowing" condition, again, not detectable by the AFCI technology.

It is my opinion that as few as 5% or less of the branch circuit and cord caused electrical fires occur under conditions that are detectable by the AFCI.

The substantiation that has been presented is not factual in identifying the conditions.

During subsequent action on a motion to reconsider Comment 17-79 dealing with AFCI and LCDI protection of cords supplying portable electric heaters, the following statement was made by UL and appears to apply similarly to the discussion of this proposal. The speaker was John Kovacik of UL and this statement can be found on Page 166 of the Draft transcript of these proceedings:

"LCDIs and AFCIs do indeed have the potential to eliminate or reduce fires in certain situations and their use is to be encouraged. However, on a rational basis.

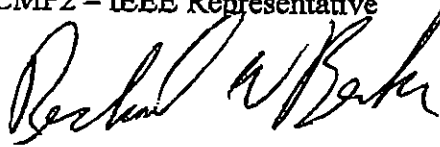
There are still questions as to how much protection these devices will provide and which appliances will actually benefit from their use. These technologies can be deployed in various ways, including at panel boards, in receptacles, in plugs in a variety of appliances. There is, however, no overall plan 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 possibly from room air conditioners, which is where they're currently required, and develop a recommendation as to their most appropriate

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application. The task force should be asked to recommend where the use of LCDI's and AFCI's for appliance cords make 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 this proposal."

I agree with the UL statement. If this device is ineffective, as it appears to be, we are requiring consumers to spend a tremendous amount of money with extremely small benefit. This concern needs to be investigated and documented before proceeding with this technology.

Richard W. Becker PE
CMP2 - IEEE Representative



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BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

☐ **AGREE**

☒ **DISAGREE***
DISAGREE

☐ **ABSTAIN***

Part 2: With respect to the suitability of the resultant text should the amendment not be agreed to, the text would be:**

☐ **SUITABLE**

☒ **UNSUITABLE***
UNSUITABLE

☐ **ABSTAIN***

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

SEE ATTACHED

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature:

Name - Please Print:

JOE WIDMAGEN

Date:

6/18/04

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Joe Wiehagen, Alternate, NAHB

Substantiation, Part I with respect to the Amendment to Accept Comment 2-91:

Disagreement is based on the panel's original reasons for rejecting this comment. There remains absolutely no justification to reverse that decision. At the Association Technical Meeting on May 26, all of those who spoke in favor of the amendment provided no new credible data, facts or other information that appropriately justifies the action to Accept the comment.

The committee simply has not received any further data that responds to the issues raised by the committee in its rejection of the proposal, and in fact new issues have been raised that indicate the opposite. The CMP-2 panel has thoroughly and appropriately considered this matter prior to the May 26th meeting and its original decision to reject the Comment is sound and it should stand.

Furthermore, the committee has twice approved a code requirement for a device that manufacturers promised to provide at some later date with an understanding that it will perform to certain specifications – the first promise resulted in a device that did not meet expectations of the committee and a device for which no field performance data is yet publicly available. The committee has not seen the second-generation device. Expansion of the code requirement at this time does not appear to be prudent or acting in the consumer interest.

Supporting an amendment to expand the use of AFCI's when so many substantial questions and concerns remain, when no new information has been presented to the panel since the decision to reject the comment, and especially when the current requirement for dwelling unit bedrooms has never been adequately justified in the first place, is not sound or practical and is not in the best interest of the public welfare the NEC is intended to protect.

Substantiation, Part II with respect to the Suitability of the Amendment to Accept Comment 2-91:

The resulting amendment is wholly unsuitable regardless of the position one takes in support of or opposition to it. What does the amended provision now actually require? It can be interpreted in at least two ways, both of which are completely different but are arguably correct interpretations even though neither one of them are the intent, as most understand it, of the proponent. For example, among others, is the new requirement to be interpreted as scoping only "living areas" within dwelling unit bedrooms or is one permitted to take exceptional license and scope in all "living areas" only within a dwelling unit? If the second option for interpretation is followed, bedrooms, bathrooms, kitchens, etc. would be excluded under NFPA's current definition of "living area".

This is a wholly unsuitable amendment that would require more than an editorial fix or any other fix that would be permitted by NFPA's Rules Governing Committee Projects.

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BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

☐ **AGREE**

☒ **DISAGREE***

☐ **ABSTAIN***

Part 2: With respect to the suitability of the resultant text should the amendment not be agreed to, the text would be:**

☐ **SUITABLE**

☒ **UNSUITABLE***

☐ **ABSTAIN***

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

***Please give reasons for Disagree, Unsuitable or Abstain**

****See transmittal memo for definition of "suitable"**

See attached

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature:

Raymond W. Weber

Name - Please Print:

RAYMOND W. WEBER,

Date: 6-14-2004.

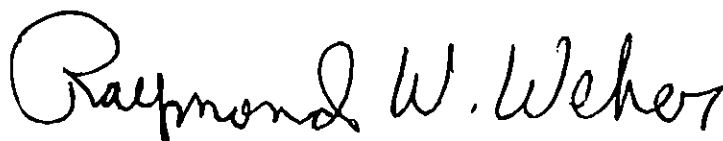
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CMP-2 Ballot on Comment 2-91 (Proposal 2-140) 2005 NEC

Raymond W. Weber, Comment on Negative Vote.

I remain committed to the enhancement and expansion of the placement and use of AFCI protection as a means for increased public safety. However, as presently worded and the section placement, without substantial rewording to address the complete structure as to where the requirement is applicable and where it is not, would be an enforcement issue for inspectors. A definition for "all living areas" or some other guidance for clarification as to location would need to be incorporated. The section heading then could be changed to "Dwelling Unit Living Areas" clearly indicating the intended area of inclusion. What would happen with attached garage areas, that have the potential for a number of cord and plug connected pieces of electrical equipment that may or may not remain plugged in? The body of the texts would also need to be changed to remove the term "receptacles" and continue with the proposed texts.

By voting in the negative, I am concerned that perhaps, we may be reverting back to the old text that would not incorporate the agreed upon language that is in ROC 2-87a which does provide for greater electrical safety with AFCIs and as demonstrated in data and field trials to function in order to reduce the potential for fires from occurring. The Standards Council should retain the final panel action on ROC 2-87a and its revisions; clearly an increased electrical safety feature.



Raymond W. Weber
Chair CMP-2
Representing: IAEI

BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

☐

AGREE

☒

DISAGREE*

☐

ABSTAIN*

Part 2: With respect to the suitability** of the resultant text should the amendment not be agreed to, the text would be:

☒

SUITABLE

☐

UNSUITABLE*

☐

ABSTAIN*

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

See Attached for reasons for
disagreeing

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature:

Joseph P. Roche

Name - Please Print:

Joseph P. Roche

Date: _

Amendment: Accept Comment 2-91 (Proposal 2-140)

Person voting: J. P. Roche

Reason for Disagreeing:

The implementation of the AFCI technology has not reached that point at which it is fully accepted as having achieved the level of arc-flash and fire prevention claimed. As the panel has stated before there is no data as yet to substantiate the fact that the implementation of AFCI technology in the bedroom has resulted in a reduction in the number of fires. While one might not report an AFCI device tripping and perhaps preventing a fire, in the long term the number of fires should show a drop.

The technology is still in transition with the move to a combination device in 2008. Problems may still arise in the field application of the complete product. To include all branch circuits supplying living area receptacle outlets will add another level of complexity at a very critical time. The additional variety of loads that would be added across all living areas may present new and unforeseen problems to the technology.

The comment and proposal also restricts the branch circuits to those supplying receptacle outlets. This puts a limitation on the technology's application that I do not believe was intended. Prior and projected use of AFCI's included branch circuits supplying "outlets", not "receptacle outlets. There is a conflict.

Suitability:

The failure of the amendment to pass would not create a suitability problem as long as the adoption of other comments, such as 2-87a, proceed.

BALLOT
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MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

☐ **AGREE**

☒ **DISAGREE***

☐ **ABSTAIN***

Part 2: With respect to the suitability of the resultant text should the amendment not be agreed to, the text would be:**

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☒ **UNSUITABLE***

☐ **ABSTAIN***

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

***Please give reasons for Disagree, Unsuitable or Abstain**

****See transmittal memo for definition of "suitable"**

The comment 2-91 (proposal 2-140) as submitted is not clear and creates a lot of confusing application. The presenter did not define the meaning of "all living areas" in dwelling unit bedrooms. The existing code requires that all branch circuits supplying receptacles outlets in dwelling unit bedrooms shall be protected by AFCI. It means the proposal did not add any additional requirements to the existing code. If the presenter did mean that branch circuits in all living areas in dwelling units shall be protected by AFCI, then the presenter should resubmit this proposal in the next code cycle for careful study/consideration by the panel members.

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: Albert Sidhom

Name - Please Print: ALBERT SIDHOM

Date: 6/15/2004

BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (proposal 2-140)

Part 1: With respect to the amendment, I:

☐ **DISAGREE** ☒ **DISAGREE** ☐ **ABSTAIN**

Part 2: With respect to the suitability** of the resultant text should the amendment not be agreed to, the text would be:

☐ **SUITABLE** ☒ **UNSUITABLE** ☐ **ABSTAIN**

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

-----SEE ATTACHED EXPLANATION FOR DISAGREEMENT AND UNSUITABILITY-----

Return by June 18, 2004 to:

Jean O' Connor
National Fire Protection Association
1 Batterymarch Park
O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Name - Please Print: MICHAEL D. TOMAN

Date: - 6/8/04

MICHAEL D. TOMAN CMP-2
EXPLANATION OF DISAGREEMENT AND UNSUITABILITY REGARDING
THE AMENDMENT TO ACCEPT COMMENT 2-91/PROPOSAL 2-140
6/8/04

After my review of the floor amendment to accept Comment 2-91/Proposal 2-140, both of which were overwhelmingly rejected by CMP-2 during the current NEC cycle, it is inherently clear to me that this Comment/Proposal simply put "is just plain bad code"! Among the many flaws and conflicts that acceptance of 2-91 would present, is that of "reversing" the upgraded AFCI requirements which were accepted by CMP-2 during the 2005 NEC process.

With respect to my disagreement with the amendment, the following is offered:

- 1) It should be noted that technically, the affect of acceptance of this comment/proposal would result in bedrooms being required to only have AFCI protected "receptacle outlets", in lieu of "all outlets installed in dwelling unit bedrooms" as is required at this time. Also, the Title of 210-12(B) remains "Dwelling Unit Bedrooms" in this comment/proposal and the change of text deleting "~~dwelling unit bedrooms~~" and replacing that text with "in all living areas" creates a confusing interpretation dilemma, when one tries to define the "living areas" of dwelling unit bedrooms. This changed text would effectively exclude closets of bedrooms and any associated lighting and receptacle outlets from being AFCI protected, reducing the now required AFCI protection that was previously accepted by CMP-2, and also creating an enforcement nightmare.
- 2) Also, the acceptance of this comment/proposal would delete the mandate by CMP-2 that "listed arc-fault circuit interrupters" be "combination type" by January 1, 2008, that was accepted by CMP-2 because of the additional level of AFCI protection offered by the combination type, in lieu of the AFCI branch/feeder type, as accepted per CMP-2 Panel Comment 2-87a. In addition, the exceptions allowing the use of AFCI receptacle devices installed within 6' of the branch circuit overcurrent device with mechanical protection, as accepted by CMP-2, and the fine print note referencing the AFCI - UL Standard, would be deleted.
- 3) Addressing the issue of AFCI expansion; there has not been an adequate amount of experience data in which to base any expansions of this device at this time. In the real world, the experience data that CMP-2 would base an AFCI expansion on, would be that data that is derived from the experience of having these devices installed in the public domain. Many jurisdictions only recently have adapted the 1999 NEC, much less the 2002 NEC. This clearly indicates that the requirements for arc-fault circuit interrupters in 210.12, and the subsequent installation of these devices in the public domain, is really only in the early stages, and accurate experience data on the dependability and reliability of these devices is still being developed. Although the laboratory

tests of arc-fault circuit interrupters show that these devices should work, the experience data in the public domain can conclusively determine if these devices can interface with other equipment and operate as designed and distinguish between good arcs and bad arcs without nuisance tripping. When responsible experience data is available, the data can show if arc-fault circuit interrupters are worthy of expansion, but not until that time, as simply put, expansion of arc-fault circuit interrupters at this time is equivalent to "flying by the seat of the pants".

With respect to the unsuitability of the amendment, the following is offered:

- 1) See my explanation of disagreement in note #1 above, as pertains to the multiple conflicts that acceptance of this comment/proposal would present, that make it clearly unsuitable.

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☒ **UNSUITABLE***

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**See transmittal memo for definition of "suitable"

Part 1: WITH the INTRODUCTION OF THE COMBINATION AFCI IT
WOULD BE PREMATURE TO EXPAND THE REQUIREMENT UNTIL THE NEW DEVICE IS PROVEN.

PART 2: The PANEL ACTION ON 2-87A SHOULD BE TAKEN INTO
ACCOUNT IN RELATION TO ANY ACTION ON THIS ITEM.

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: Robert G. Wilkinson

Name - Please Print: ROBERT G. WILKINSON

Date: 6.1.04

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BALLOT
NFPA 70 – Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

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☐ **SUITABLE**

☒ **UNSUITABLE***

☐ **ABSTAIN***

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**See transmittal memo for definition of "suitable"

See attached reason

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: Susan W. Porter

Name - Please Print: SUSAN W. PORTER

Date: 6/17/2004

04-7-1-a-1

pg. 21

Sultability of Resultant Text

CMP-2 accepted other changes in Comment 2-87a that are not reflected in Proposal 2-140 and Comment 2-91:

- Requiring the combination AFCI after January 1, 2008.
- Added exception for AFCIs away from the point of origin of the branch circuit if it is within 6 ft of the branch circuit OCP and the circuit conductors are in a metal raceway or metal-sheathed cable.

The recommended wording from Proposal 2-140 also puts the word "receptacle" back in front of "outlet". This was deleted in the 2002 Code, extending the AFCI requirement to all outlets in the bedroom.

If the amendment is not agreed upon, the resultant text should revert to that agreed upon in Comment 2-87a. If the agreement is agreed upon, I suggest that the text of Comment 2-87a be incorporated into the changes from Proposal 2-140 and Comment 2-91 as follows:

210.12 Arc-Fault Circuit-Interrupter Projection.

(A) Definition. An arc-fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

(B) Dwelling Units. ~~Bedrooms.~~ All 120 volt, single phase, 15 and 20-ampere branch circuits supplying outlets installed in ~~dwelling-unit bedrooms~~ all living areas shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit. Branch/Feeder AFCI's shall be permitted to be used to meet the requirements of 210.12(B) until January 1, 2008.

FPN: For information on types of arc-fault circuit interrupts, see UL 1699-1999, Standard for Arc-Fault Circuit Interrupters.

Exception: The location of the arc-fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit in compliance with (1) and (2):

- (1) The arc-fault circuit interrupter shall be installed within 1.8 m (6 ft) of the branch circuit overcurrent device as measured along the branch circuit conductors.
- (2) The circuit conductors between the branch circuit overcurrent device and the arc-fault circuit interrupter shall be installed in a metal raceway or a cable with a metallic sheath.

It should also be noted that the suggested term "living area" is not defined in Article 100 or Article 210. It may be appropriate to include the list of occupancies in 210.52(A) instead, if this meets the submitter's intent.

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BALLOT
NFPA 70 - Annual 2004
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MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

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Part 2: With respect to the suitability** of the resultant text should the amendment not
be agreed to, the text would be:

☒ **UNSUITABLE**

☐ **UNSUITABLE***

☐ **ABSTAIN***

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

SEE ATTACHED

TO: **Return by June 18, 2004 to:**

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

3 PAGES

Signature: Richard W. Becker

Name - Please Print: RICHARD W. BECKER

Date:

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BALLOT
NFPA 70 – ANNUAL 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Richard W. Becker - Reason for Disagree
June 18, 2004

I believe this proposal is an attempt to expand the requirements for AFCI to all of the lighting and receptacle branch circuits in a Dwelling. Proposal 2-140 refers to substantiation that is not conclusive. The research shows the device can work under very specific circumstances but does not demonstrate effectiveness on the majority of electrical incidences that produce ignition.

It is my position that substantiation still has not been provided that demonstrates that this technology can detect and prevent ignition in the "fires of electrical origin" that are being reported by fire investigators. A short circuit (parallel failure) in a cord or in premise wiring systems can absolutely cause ignition because of "burning" and "sparking", and will generally trip a standard overcurrent device, but after ignition has occurred! The AFCI does not detect this condition. A severed conductor or loose connection (series failure) can cause ignition by producing heat, "joule heating", adequate to produce a visible "glowing" condition, again, not detectable by the AFCI technology.

It is my opinion that as few as 5% or less of the branch circuit and cord caused electrical fires occur under conditions that are detectable by the AFCI.

The substantiation that has been presented is not factual in identifying the conditions.

During subsequent action on a motion to reconsider Comment 17-79 dealing with AFCI and LCDI protection of cords supplying portable electric heaters, the following statement was made by UL and appears to apply similarly to the discussion of this proposal. The speaker was John Kovacik of UL and this statement can be found on Page 166 of the Draft transcript of these proceedings:

"LCDIs and AFCIs do indeed have the potential to eliminate or reduce fires in certain situations and their use is to be encouraged. However, on a rational basis.

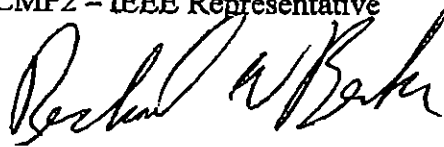
There are still questions as to how much protection these devices will provide and which appliances will actually benefit from their use. These technologies can be deployed in various ways, including at panel boards, in receptacles, in plugs in a variety of appliances. There is, however, no overall plan 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 possibly from room air conditioners, which is where they're currently required, and develop a recommendation as to their most appropriate

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application. The task force should be asked to recommend where the use of LCDI's and AFCI's for appliance cords make 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 this proposal."

I agree with the UL statement. If this device is ineffective, as it appears to be, we are requiring consumers to spend a tremendous amount of money with extremely small benefit. This concern needs to be investigated and documented before proceeding with this technology.

Richard W. Becker PE
CMP2 - IEEE Representative

A handwritten signature in black ink, appearing to read "Richard W. Becker", written in a cursive style.

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BALLOT
NFPA 70 - Annual 2004
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MAY 2004 ASSOCIATION AMENDMENT

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Part 1: With respect to the amendment, I:

☐ **AGREE**

☒ **DISAGREE***
DISAGREE

☐ **ABSTAIN***

Part 2: With respect to the suitability** of the resultant text should the amendment not be agreed to, the text would be:

☐ **SUITABLE**

☒ **UNSUITABLE***
UNSUITABLE

☐ **ABSTAIN***

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**See transmittal memo for definition of "suitable"

SEE ATTACHED

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: Joe Widmagen

Name - Please Print: JOE WIDMAGEN

Date: 6/18/04

04-7-1-a-1 pg. 26

Joe Wiehagen, Alternate, NAHB

Substantiation, Part I with respect to the Amendment to Accept Comment 2-91:

Disagreement is based on the panel's original reasons for rejecting this comment. There remains absolutely no justification to reverse that decision. At the Association Technical Meeting on May 26, all of those of who spoke in favor of the amendment provided no new credible data, facts or other information that appropriately justifies the action to Accept the comment.

The committee simply has not received any further data that responds to the issues raised by the committee in its rejection of the proposal, and in fact new issues have been raised that indicate the opposite. The CMP-2 panel has thoroughly and appropriately considered this matter prior to the May 26th meeting and its original decision to reject the Comment is sound and it should stand.

Furthermore, the committee has twice approved a code requirement for a device that manufacturers promised to provide at some later date with an understanding that it will perform to certain specifications – the first promise resulted in a device that did not meet expectations of the committee and a device for which no field performance data is yet publicly available. The committee has not seen the second-generation device. Expansion of the code requirement at this time does not appear to be prudent or acting in the consumer interest.

Supporting an amendment to expand the use of AFCI's when so many substantial questions and concerns remain, when no new information has been presented to the panel since the decision to reject the comment, and especially when the current requirement for dwelling unit bedrooms has never been adequately justified in the first place, is not sound or practical and is not in the best interest of the public welfare the NEC is intended to protect.

Substantiation, Part II with respect to the Suitability of the Amendment to Accept Comment 2-91:

The resulting amendment is wholly unsuitable regardless of the position one takes in support of or opposition to it. What does the amended provision now actually require? It can be interpreted in at least two ways, both of which are completely different but are arguably correct interpretations even though neither one of them are the intent, as most understand it, of the proponent. For example, among others, is the new requirement to be interpreted as scoping only "living areas" within dwelling unit bedrooms or is one permitted to take exceptional license and scope in all "living areas" only within a dwelling unit? If the second option for interpretation is followed, bedrooms, bathrooms, kitchens, etc. would be excluded under NFPA's current definition of "living area".

This is a wholly unsuitable amendment that would require more than an editorial fix or any other fix that would be permitted by NFPA's Rules Governing Committee Projects.

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BALLOT
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2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

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☐ **ABSTAIN***

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**See transmittal memo for definition of "suitable"

See attached

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature:

Raymond W. Weber

Name - Please Print:

RAYMOND W. WEBER

Date: 6-14-2004

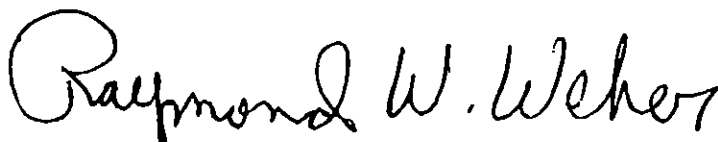
04-7-1-a-1 pg. 28

CMP-2 Ballot on Comment 2-91 (Proposal 2-140) 2005 NEC

Raymond W. Weber, Comment on Negative Vote.

I remain committed to the enhancement and expansion of the placement and use of AFCI protection as a means for increased public safety. However, as presently worded and the section placement, without substantial rewording to address the complete structure as to where the requirement is applicable and where it is not, would be an enforcement issue for inspectors. A definition for "all living areas" or some other guidance for clarification as to location would need to be incorporated. The section heading then could be changed to "Dwelling Unit Living Areas" clearly indicating the intended area of inclusion. What would happen with attached garage areas, that have the potential for a number of cord and plug connected pieces of electrical equipment that may or may not remain plugged in? The body of the texts would also need to be changed to remove the term "receptacles" and continue with the proposed texts.

By voting in the negative, I am concerned that perhaps, we may be reverting back to the old text that would not incorporate the agreed upon language that is in ROC 2-87a which does provide for greater electrical safety with AFCIs and as demonstrated in data and field trials to function in order to reduce the potential for fires from occurring. The Standards Council should retain the final panel action on ROC 2-87a and its revisions; clearly an increased electrical safety feature.



Raymond W. Weber
Chair CMP-2
Representing: IAEI

BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

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☐ ABSTAIN*

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

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See Attached for reasons for
disagreeing

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature:

Joseph P. Roche

Name - Please Print:

Joseph P. Roche

Date: _

Amendment: Accept Comment 2-91 (Proposal 2-140)

Person voting: J. P. Roche

Reason for Disagreeing:

The implementation of the AFCI technology has not reached that point at which it is fully accepted as having achieved the level of arc-flash and fire prevention claimed. As the panel has stated before there is no data as yet to substantiate the fact that the implementation of AFCI technology in the bedroom has resulted in a reduction in the number of fires. While one might not report an AFCI device tripping and perhaps preventing a fire, in the long term the number of fires should show a drop.

The technology is still in transition with the move to a combination device in 2008. Problems may still arise in the field application of the complete product. To include all branch circuits supplying living area receptacle outlets will add another level of complexity at a very critical time. The additional variety of loads that would be added across all living areas may present new and unforeseen problems to the technology.

The comment and proposal also restricts the branch circuits to those supplying receptacle outlets. This puts a limitation on the technology's application that I do not believe was intended. Prior and projected use of AFCI's included branch circuits supplying "outlets", not "receptacle outlets. There is a conflict.

Suitability:

The failure of the amendment to pass would not create a suitability problem as long as the adoption of other comments, such as 2-87a, proceed.

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**See transmittal memo for definition of "suitable"

The comment 2-91 (proposal 2-140) as submitted is not clear and creates a lot of confusing application. The presenter did not define the meaning of "all living areas" in dwelling unit bedrooms. The existing code requires that all branch circuits supplying receptacles outlets in dwelling unit bedrooms shall be protected by AFCI. It means the proposal did not add any additional requirements to the existing code. If the presenter did mean that branch circuits in all living areas in dwelling units shall be protected by AFCI, then the presenter should resubmit this proposal in the next code cycle for careful study/consideration by the panel members.

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: Albert Sidhom

Name - Please Print: ALBERT SIDHOM

Date: 6/15/2004

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1 Batterymarch Park
O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Name - Please Print: MICHAEL D. TOMAN

Date: - 6/8/04

MICHAEL D. TOMAN CMP-2
EXPLANATION OF DISAGREEMENT AND UNSUITABILITY REGARDING
THE AMENDMENT TO ACCEPT COMMENT 2-91/PROPOSAL 2-140
6/8/04

After my review of the floor amendment to accept Comment 2-91/Proposal 2-140, both of which were overwhelmingly rejected by CMP-2 during the current NEC cycle, it is inherently clear to me that this Comment/Proposal simply put "is just plain bad code"! Among the many flaws and conflicts that acceptance of 2-91 would present, is that of "reversing" the upgraded AFCI requirements which were accepted by CMP-2 during the 2005 NEC process.

With respect to my disagreement with the amendment, the following is offered:

- 1) It should be noted that technically, the affect of acceptance of this comment/proposal would result in bedrooms being required to only have AFCI protected "receptacle outlets", in lieu of "all outlets installed in dwelling unit bedrooms" as is required at this time. Also, the Title of 210-12(B) remains "Dwelling Unit Bedrooms" in this comment/proposal and the change of text deleting "~~dwelling unit bedrooms~~" and replacing that text with "in all living areas" creates a confusing interpretation dilemma, when one tries to define the "living areas" of dwelling unit bedrooms. This changed text would effectively exclude closets of bedrooms and any associated lighting and receptacle outlets from being AFCI protected, reducing the now required AFCI protection that was previously accepted by CMP-2, and also creating an enforcement nightmare.
- 2) Also, the acceptance of this comment/proposal would delete the mandate by CMP-2 that "listed arc-fault circuit interrupters" be "combination type" by January 1, 2008, that was accepted by CMP-2 because of the additional level of AFCI protection offered by the combination type, in lieu of the AFCI branch/feeder type, as accepted per CMP-2 Panel Comment 2-87a. In addition, the exceptions allowing the use of AFCI receptacle devices installed within 6' of the branch circuit overcurrent device with mechanical protection, as accepted by CMP-2, and the fine print note referencing the AFCI - UL Standard, would be deleted.
- 3) Addressing the issue of AFCI expansion; there has not been an adequate amount of experience data in which to base any expansions of this device at this time. In the real world, the experience data that CMP-2 would base an AFCI expansion on, would be that data that is derived from the experience of having these devices installed in the public domain. Many jurisdictions only recently have adapted the 1999 NEC, much less the 2002 NEC. This clearly indicates that the requirements for arc-fault circuit interrupters in 210.12, and the subsequent installation of these devices in the public domain, is really only in the early stages, and accurate experience data on the dependability and reliability of these devices is still being developed. Although the laboratory

tests of arc-fault circuit interrupters show that these devices should work, the experience data in the public domain can conclusively determine if these devices can interface with other equipment and operate as designed and distinguish between good arcs and bad arcs without nuisance tripping. When responsible experience data is available, the data can show if arc-fault circuit interrupters are worthy of expansion, but not until that time, as simply put, expansion of arc-fault circuit interrupters at this time is equivalent to "flying by the seat of the pants".

With respect to the unsuitability of the amendment, the following is offered:

- 1) See my explanation of disagreement in note #1 above, as pertains to the multiple conflicts that acceptance of this comment/proposal would present, that make it clearly unsuitable.

04-7-1-a-1 pg. 35

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Part 1: WITH the INTRODUCTION OF The COMBINATION AFCI it
WOULD be premature to EXPAND The REQUIREMENT UNTIL the new device IS PROVEN.

PART 2: The Panel ACTION ON 2-87A should be taken INTO
ACCOUNT IN relation to ANY ACTION on this item.

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature:

Robert E. Wilkinson

Name - Please Print: ROBERT E. WILKINSON

Date: 6.1.04

04-7-1-a-1 pg. 36

BALLOT
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MAY 2004 ASSOCIATION AMENDMENT

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NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

See attached reason

Return by June 18, 2004 to:

Jean O'Connor

National Fire Protection Association

1 Batterymarch Park

P.O. Box 9101

Quincy, MA 02269-9101

FAX: 617-984-7070

Signature:

Susan W. Porter

Name - Please Print:

SUSAN W. PORTER

Date:

6/17/2004

04-7-1-a-1 pg. 37

Sultability of Resultant Text

CMP-2 accepted other changes in Comment 2-87a that are not reflected in Proposal 2-140 and Comment 2-91:

- Requiring the combination AFCI after January 1, 2008.
- Added exception for AFCIs away from the point of origin of the branch circuit if it is within 6 ft of the branch circuit OCP and the circuit conductors are in a metal raceway or metal-sheathed cable.

The recommended wording from Proposal 2-140 also puts the word "receptacle" back in front of "outlet". This was deleted in the 2002 Code, extending the AFCI requirement to all outlets in the bedroom.

If the amendment is not agreed upon, the resultant text should revert to that agreed upon in Comment 2-87a. If the agreement is agreed upon, I suggest that the text of Comment 2-87a be incorporated into the changes from Proposal 2-140 and Comment 2-91 as follows:

210.12 Arc-Fault Circuit-Interrupter Projection.

(A) Definition. An arc-fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

(B) Dwelling Units. ~~Bedrooms.~~ All 120 volt, single phase, 15 and 20-ampere branch circuits supplying outlets installed in ~~dwelling-unit bedrooms~~ all living areas shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit. Branch/Feeder AFCI's shall be permitted to be used to meet the requirements of 210.12(B) until January 1, 2008.

FPN: For information on types of arc-fault circuit interrupts, see UL 1699-1999, Standard for Arc-Fault Circuit Interrupters.

Exception: The location of the arc-fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit in compliance with (1) and (2):

- (1) The arc-fault circuit interrupter shall be installed within 1.8 m (6 ft) of the branch circuit overcurrent device as measured along the branch circuit conductors.
- (2) The circuit conductors between the branch circuit overcurrent device and the arc-fault circuit interrupter shall be installed in a metal raceway or a cable with a metallic sheath.

It should also be noted that the suggested term "living area" is not defined in Article 100 or Article 210. It may be appropriate to include the list of occupancies in 210.52(A) instead, if this meets the submitter's intent.

BALLOT
NFPA 70 – Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:



AGREE



DISAGREE*



ABSTAIN*

Part 2: With respect to the suitability** of the resultant text should the amendment not be agreed to, the text would be:



SUITABLE



UNSUITABLE*



ABSTAIN*

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

See Attached

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: _____



Name - Please Print: _____

Jim Pauley

Date: June 8, 2004

CMP 2 Ballot on Comment 2-91 – Association Amendment**Jim Pauley - Affirmative Comment on Vote****Comment on Suitability of the Text**

Regardless of the result of the ballot on the amendment, the Standards Council will need to carefully look at the resulting language to make sure that related text accepted by CMP 2 is not lost. The submitter of Comment 2-91 clearly indicated what he intended to change (“dwelling unit bedrooms” to “all living areas”) through legislative text, but his surrounding text is from the 1999 NEC and consists of material that is not up to date.

Comment 2-87a contains the final language agreed to by CMP 2. This comment deals with changes to the basic text including an effective date for the AFCI type, a FPN directing the user to the UL standard for types of AFCI’s and a new exception related to where the AFCI can be installed on the branch circuit. There was no discussion or disagreement at the Technical Report Session on the changes in 2-87a. These changes should be retained.

If the Amendment is Accepted

The Standards Council should integrate the revision into the language of Comment 2-87a by:

- ⇒ Changing the title of the section from “Dwelling Unit Bedrooms” to “Dwelling Unit Living Areas”. This is due to the fact that the submitter left the title as bedrooms, but revised the body text to living areas.
- ⇒ Changing the body of the text of Comment 210.12(B) to read “...outlets installed in all living areas shall be...”

If the Amendment is Not Accepted

The Standards Council should revert to the language contained in ROC 2-87a as the final text. This text was successfully accepted by the ballot of CMP 2 and the TCC and it was not disputed at the Technical Report Session. Comments were also made on the record during the floor discussions to also make it clear the final text needs to take into account the panel revisions contained in Comment 2-87a.

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BALLOT
NFPA 70 - Annual 2004
2005 Edition of the NEC
MAY 2004 ASSOCIATION AMENDMENT

Amendment: Accept Comment 2-91 (Proposal 2-140)

Part 1: With respect to the amendment, I:

☒ **AGREE**

☒ **DISAGREE***

☐ **ABSTAIN***

Part 2: With respect to the suitability** of the resultant text should the amendment not be agreed to, the text would be:

☐ **SUITABLE**

☒ **UNSUITABLE***

☐ **ABSTAIN***

NOTE: Please complete Part 2 of the ballot regardless of how you vote on Part 1.

*Please give reasons for Disagree, Unsuitable or Abstain

**See transmittal memo for definition of "suitable"

See attached reason

Return by June 18, 2004 to:

Jean O'Connor
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
FAX: 617-984-7070

Signature: Susan W. Porter

Name - Please Print: SUSAN W. PORTER

Date: 6/17/2004

04-7-1-a-1 pg. 41

Suitability of Resultant Text

CMP-2 accepted other changes in Comment 2-87a that are not reflected in Proposal 2-140 and Comment 2-91:

- Requiring the combination AFCI after January 1, 2008.
- Added exception for AFCIs away from the point of origin of the branch circuit if it is within 6 ft of the branch circuit OCP and the circuit conductors are in a metal raceway or metal-sheathed cable.

The recommended wording from Proposal 2-140 also puts the word "receptacle" back in front of "outlet". This was deleted in the 2002 Code, extending the AFCI requirement to all outlets in the bedroom.

If the amendment is not agreed upon, the resultant text should revert to that agreed upon in Comment 2-87a. If the agreement is agreed upon, I suggest that the text of Comment 2-87a be incorporated into the changes from Proposal 2-140 and Comment 2-91 as follows:

210.12 Arc-Fault Circuit-Interrupter Projection.

(A) Definition. An arc-fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

(B) Dwelling Units. ~~Bedrooms.~~ All 120 volt, single phase, 15 and 20-ampere branch circuits supplying outlets installed in ~~dwelling-unit bedrooms~~ all living areas shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit. Branch/Feeder AFCI's shall be permitted to be used to meet the requirements of 210.12(B) until January 1, 2008.

FPN: For information on types of arc-fault circuit interrupters, see UL 1699-1999, Standard for Arc-Fault Circuit Interrupters.

Exception: The location of the arc-fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit in compliance with (1) and (2):

- (1) The arc-fault circuit interrupter shall be installed within 1.8 m (6 ft) of the branch circuit overcurrent device as measured along the branch circuit conductors.
- (2) The circuit conductors between the branch circuit overcurrent device and the arc-fault circuit interrupter shall be installed in a metal raceway or a cable with a metallic sheath.

It should also be noted that the suggested term "living area" is not defined in Article 100 or Article 210. It may be appropriate to include the list of occupancies in 210.52(A) instead, if this meets the submitter's intent.

<p style="text-align: right;">Page 113</p> <p>1 go ahead and step away from the a little bit 2 and when we're ready to address new motions?</p> <p>3 Microphone 3 I saw next. 4 MR. KING: Yes, sir. My name is Donald 5 King. I am a Code Making Panel Principal of 6 Panel 2, and I represent the IBEW. 7 As well I rise in support of the motion 8 for Comment 2-91. Going back to Proposal 2-140, 9 the Consumer Product Safety Commission provided 10 adequate data to support this motion to expand the 11 use of arc-circuit protection to all living areas. 12 There was a lot of panel discussion at 13 the comment stage on this motion. The panel--many 14 of the panel members, I felt, supported the 15 expanding use of the AFCI protection, and I stand 16 in support of the motion. 17 CHAIR ISMAN: Thank you. Microphone 7. 18 MR. BECKER: My name take Dick Becker. 19 I'm a consulting electrical engineer, and I'm a 20 principal member for IEEE on Code Making Panel 2. 21 My concern on the AFCI product is that 22 the text--or the data that we've been given does 23 not distinguish between failures that are arcing 24 versus burning. And it is my feeling that the 25 test data is--does not prove conclusively that the</p>	<p style="text-align: right;">Page 115</p> <p>1 with this without the additional detail, I think 2 we're hurting ourselves. 3 CHAIR ISMAN: Thank you. 4 Microphone No. 5. 5 MR. PAULEY: I'm Jim Pauley with Square 6 D Company. I represent NEMA on Code Panel 2. 7 I was going to sit silently and see 8 where this went, but when Mr. Becker got up, I 9 had to at least respond to some of the issues. 10 The issues that raises--or ones that he 11 has raised in the panel, and they've had extensive 12 discussion, if he and I would both say we 13 disagree with each other on perhaps where this is 14 in total. If you look at the ballot statement, I 15 certainly voted to support this comment. 16 But as the Chairman said, the panel 17 went through some long deliberations to arrive at 18 where they were. I certainly believe the 19 technology can be expanded to other areas of the 20 unit and not constitute any problems to be able 21 to do this. So I believe that that can be done. 22 I do also want to point out for the 23 body that this particular comment ends up being 24 sort of a blend of items. If you look at this 25 comment, what it really does is change the words</p>
<p style="text-align: right;">Page 114</p> <p>1 arc-fault circuit technology can detect and 2 prevent the fires that have been--that we've been 3 led to believe that it will detect. It's quite 4 an expensive device compared if it is not doing 5 what we expected. 6 The distinction between burning the I- 7 squared-R or the jewel heating is a significant 8 difference that wires in the premise wiring or in 9 the cords can absolutely start and not be detected 10 by the arc-fault circuit technology. 11 I feel very strongly that we need 12 substantial data that distinguishes between the 13 two different events at this point. I don't 14 think we received that. And the arc-fault 15 technology, I think, really needs some detailed 16 research on exactly whether we're preventing the 17 fires we started or that we thought we were. My 18 concern is that the AFCI is now putting people 19 at--they think we've solved the problem. I don't 20 believe we have solved the problem. We don't 21 have any way of recording that we're getting fewer 22 fire events in cords or premise wiring. And if 23 we're not, we're misleading ourselves. We need to 24 get focused back on what the problem is, and I 25 don't think we've found that yet. So to proceed</p>	<p style="text-align: right;">Page 116</p> <p>1 "dwelling unit bedrooms" to "living areas," which 2 means it would expand to those areas. 3 There are other changes that Panel 2 4 has made to this same section dealing with some 5 particular exceptions, dealing with the fact that 6 accommodation protection in 2008, a fine-print 7 note to deal with that. If this were accepted by 8 the body, it would sort of have to be blended 9 together, because this issue deals specifically 10 with the location where AFCIs would be installed. 11 So it's a--it's an item that I think the body 12 could seriously consider. 13 I think the technology can certainly be 14 handled to expand that way, and I do want to 15 assure--and I think my Panel 2 members would agree 16 that the lengthiest discussions that we have at 17 the Panel 2 meetings are on AFCIs to address 18 these many issues that have been raised. Thanks. 19 CHAIR ISMAN: Microphone 4. 20 DR. HIRSCHLER: Marcelo Hirschler, GBH 21 International, speaking for myself and speaking in 22 support of the motion. 23 I remember in the opening session the 24 president, Jim Shannon, said that 80 percent of 25 fire fatalities occur in homes, dwellings. So</p>



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<p style="text-align: right;">Page 117</p> <p>1 what we're talking here about is potentially 2 expanding protection from fire in homes, so I 3 think we should support this motion and expand the 4 AFCIs. Thank you. 5 CHAIR ISMAN: Microphone 7. 6 MR. SMITTAL: Mr. Chairman, Walter 7 Smittal, National State Association of Fire 8 Marshals. 9 Two comments. Unfortunately, in the 10 fire service we collect negative data. Only when 11 a fire occurs does a fire service respond. If we 12 have the AFCIs in place, if they respond and 13 prevent a fire, no fire department responds. It's 14 done its job. We say all the AFCIs today are 15 working. Collecting that data is being done in a 16 different manner, a different environment, the 17 manufacturers themselves with the guarantee and 18 warranties that may exist. 19 Secondly, and last, this technology is 20 the best technology we have. There will always 21 be improvements. We look forward to those 22 improvements. But if this technology can 23 eliminate 75 percent of the fires occurring in 24 this country, then it is well worth it. 25 I wanted to--I just bought a brand-new</p>	<p style="text-align: right;">Page 119</p> <p>1 requested that this comment receive favorable 2 action to amend Code Making Panel 2's proposal 3 2-134a and Comment No. 2-87a. 4 CHAIR ISMAN: So your motion is to 5 accept 2-107? 6 MR. ROSS: Yes. 7 CHAIR ISMAN: Do we have a second? I 8 did hear a second. Please proceed. 9 MR. ROSS: My main purpose of concern 10 is to add an exception to exempt the household 11 fire alarm system, such as a lifesaving smoke 12 detector circuit, from the mandate that it be 13 connected to a sensitive asphalt circuit 14 interrupter, AFCI-protected circuit. 15 Code Making Panel 2 has proposed 16 210.12(B) that AFCIs are required for the 17 detection of branch circuits supplying outlets 18 installed in dwelling unit bedrooms. Whereas 19 11.1.2.1 and 3, 11.5.11 and 11.5.3.11 of NFPA 72, 20 National Fire Alarm Code, specifies the 21 application of smoke detectors in all sleeping 22 rooms of dwelling units. 23 Code Making Panel 2 considers the smoke 24 detector to be a bedroom outlet on the premise 25 that it is located in the bedroom and, therefore,</p>
<p style="text-align: right;">Page 118</p> <p>1 car--I should say the bank bought it, and I 2 wanted a car that got 250 miles a gallon--or 250 3 miles per gallon of gas. None available. But I 4 did go to find the next best thing with the best 5 available technology until that car comes out. 6 That's what we're dealing with. 7 I encourage a vote in the affirmative. 8 Thank you. 9 CHAIR ISMAN: Is there any additional 10 discussion on the motion to accept Item 2-91? 11 Seeing none, we'll move to a vote. All 12 those in favor of accepting 2-91, please raise 13 your hands. And all those opposed to the motion. 14 That motion carries. 15 Additional motions now on Code Making 16 Panel 2? 17 Now Microphone No. 4. 18 MR. ROSS: My name is Joseph E. Ross. 19 I'm a private consultant from Haverhill, Mass, 20 Ross Electrical Association. I have no--represent 21 no organization, and I do not have any 22 constituents that are interested or concerned with 23 this issue. 24 My main purpose of concern is to add-- 25 oh, as a submitter of Public Comment 2-107, it is</p>	<p style="text-align: right;">Page 120</p> <p>1 should be connected to an AFCI-protected circuit. 2 Code Making Panel 2 has rejected 3 several proposals and comments to exempt 4 lifesaving smoke detectors from being connected to 5 sensitive AFCI-protected circuits during the 6 process for the 2005 NEC. It is to be noted that 7 code panel's action was to reject an exemption for 8 smoke detectors. Code Panel 19's action was to 9 hold any application for--any application for 10 550.25 from mobile and manufactured homes, and 11 Code Panel 19's action was to accept a provision 12 for 760.21 and 760.41 to exempt fire detection and 13 alarm systems from being connected to AFCI- 14 protected circuits. 15 The Technical Correlating Committee of 16 the NEC Committee negated the Code Making Panel 19 17 action to hold by determining it to be reported 18 as a reject to correlate with the action of Code 19 Making Panel 2. There was no such NEC Technical 20 Correlating Committee note to the Code Making 21 Panel 3 action to accept. 22 Wherein the provisions of 90.3, Code 23 Arrangements, specify Chapter 7 can supplement, 24 modify or amend Chapter 2, there should have been 25 an NEC Technical Correlating Committee note</p>



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