

BUILDING STANDARDS COMMISSION

2525 Natomas Park Drive, Suite 130
Sacramento, California 95833-2936
(916) 263-0916 FAX (916) 263-0959



BUILDING STANDARDS INFORMATION BULLETIN 16-02 (REVISED)

DATE: January 12, 2017

TO: LOCAL BUILDING DEPARTMENTS
STATE AGENCIES AND DEPARTMENTS
LICENSED CONTRACTORS
DESIGN PROFESSIONALS
INTERESTED PARTIES

SUBJECT: National Fire Protection Association Tentative Interim Amendments #14-9, 14-10, 14-11 and 14-12 regarding Article 690, Section 690.17, 690.12(2), Article 705, Section 705.12(D)(6) and 705.12(D)(2)(3)(e) of the **2016 California Electrical Code** based on the **2014 National Electrical Code**.

The purpose of this Information Bulletin is to advise the Title 24 regulated community of Tentative Interim Amendments (TIA) #14-9, 14-10, 14-11 and 14-12 issued by the National Fire Protection Association (NFPA) and applying to the 2014 National Electrical Code (NEC) Article 690, Sections 690.17, 690.12(2), Article 705, Section 705.12(D)(6) and 705.12(D)(2)(3)(e) regarding the installation of solar photovoltaic (PV) systems.

Pursuant to Section 5 of the NFPA Regulations Governing the Development of NFPA Standards, the National Fire Protection Association issued the following TIA to NFPA 70®, National Electrical Code®, 2014 edition. The TIA was processed by the NEC Code-Making Panel 4 and the Correlating Committee on National Electrical Code, and was issued by the Standards Council on August 4, 2016, with an effective date of August 24, 2016.

The 2014 NEC is the base model code for the 2016 California Electrical Code (CEC) which is Part 3 of the California Building Standards Code in Title 24, California Code of Regulations. The CEC and the balance of the 13-part California Building Standards Code will be effective on January 1, 2017.

The provisions of the NFPA, TIA #14-9, 14-10, 14-11 and 14-12 were developed after California's adoption of the 2014 NEC and therefore are not approved as part of the in the 2016 CEC. It is important to note that for local government to enforce the provisions of these TIA's they may do so by either:

- **Enacting a local ordinance:** Local ordinances that amend Title 24 building standards and are subject to requirements of California law and must be enacted and filed for each edition of the California Building Standards Code. Ordinances generally must exercise more restrictive standards than the building standards approved/adopted by the

commission. These amendments must be filed and accepted, as appropriate, with CBSC before they are enforceable at the local level.

The Local Code Ordinance page on the CBSC website: (www.bsc.ca.gov/Rulemaking/LocalCodeOrdinances.aspx) has a number helpful resources including the 2016 edition of the *Guide for Local Amendments of Building Standards*, examples of ordinances that were filed in accordance with state law, and the updated California Code Adoption for Local Jurisdictions webinar. [Reference Health & Safety Code (HSC) Sections 18938, 18941.5, and 18959]

- **Permit alternative methods:** Article 90, Section 90.4 Enforcement, allows the authority having jurisdiction enforcement flexibility to by allowing alternate methods, use of products, construction or materials.

I. TIA #14-9 2016 National Electrical Code, Article 690, Section 690.17:

“Disconnect Type, Exception”

Background:

It has come to the attention of NFPA staff and various members of the solar PV industry that the placement of the exception after 690.17(E) is causing confusion. The intent of NEC Code Making Panel 4 (CMP4) was that this exception would apply to all of 690.17. In fact, it makes no sense for it to apply to 690.17(E) since the exception is not to the interrupting rating of the disconnect, but to all the provisions of disconnects. The problem arose when 690.17 was reorganized and the title of the exception inadvertently was not changed to reflect that it applies to all of 690.17. By simply stating that the exception applies to all of 690.17, and not just 690.17(E), the concern is removed and the intent is clarified.

Temporary Interim Amendment (TIA) No. 14-9 was issued by NFPA to rectify an unintended consequence of the placement of the Exception in 690.17. Due to the reorganization of 690.17, there was a need for the exception to clearly apply to all five subsections of 690.17. According to the rules of exception placement, while the exception is in the correct location, it must clearly distinguish that it applies to all five subsections rather than just the last subsection. Some authorities having jurisdiction (AHJs) have begun to enforce the exception as only relating to 690.17(E), rendering the exception meaningless and unenforceable. By simply adding the words “to (A) through (E)”, the intent of CMP4 is clarified and the exception has meaning and enforceability.

National Fire Protection Association (NFPA) Amendment to 2014 NEC:

Section 690.17(E) Exception of the 2014 NEC was amended by the NFPA, by adding reference to all list items (A) through (E). Therefore, the exception applies to all of Section 690.17 and not just list item (E).

The change is as follows:

(E) Interrupting Rating. The building or structure disconnecting means shall have an interrupting rating sufficient for the maximum circuit voltage and current that is available at the line terminals of the equipment. Where all terminals of the disconnecting means may be energized in the open position, a warning sign shall be mounted on or adjacent to the disconnecting means. The sign shall be clearly legible and have the following words or equivalent:

**WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS.
TERMINALS ON BOTH THE LINE AND LOAD SIDES
MAY BE ENERGIZED IN THE OPEN POSITION**

The warning sign(s) or label(s) shall comply with 110.21(B).

Exception to (A through E): A connector shall be permitted to be used as an ac or a dc disconnecting means, provided that it complies with the requirements of 690.33 and is listed and identified for use with specific equipment.

A complete substantiation may be found on the NFPA website:
http://www.nfpa.org/assets/files/AboutTheCodes/70/TIA_70_14_9.pdf

II. TIA #14-10 2016 National Electrical Code, Article 690, Section 690.12(2):

“Rapid Shutdown of PV Systems on Buildings” (Changing 10 second shutdown to 30 second shutdown)

Background:

Article 690.12 in the 2014 NEC was originally written to require shutdown within 10 seconds. The length of time for shutdown has been increased to 30 seconds to avoid accidental PV system shutdowns during momentary fluctuations of utility power. The 30 second shutdown requirement has already been incorporated into the 2017 NEC and UL Standard 1741.

The complete substantiation may be found on NFPA’s website:
http://www.nfpa.org/assets/files/AboutTheCodes/70/ProposedTIA%201223_NFPA_70.pdf

National Fire Protection Association (NFPA) Amendment to 2014 NEC:

Revise 690.12(2) to read as follows:

(2) Controlled conductors shall be limited to no more than 30 volts and 240VA within ~~40~~ 30 seconds of rapid shutdown initiation.

III. TIA #14-11 2016 National Electrical Code, Article 705, Section 705.12(D)(6):

“Wire Harness and Exposed Cable Arc Fault Protection”

Background:

This new requirement in the 2014 NEC has created significant problems in locations where the 2014 NEC is being enforced. When NEC Code Making Panel 4 (CMP4) approved this provision, the panel was led to believe that these products were available or would easily become available before the 2014 NEC was to be enforced. As it turns out, few if any products exist that can meet this requirement, and discussions with electrical equipment manufacturers have revealed that there are no plans to develop such products for this market. While section 90.4 of the NEC applies to this provision since certified products are not available to meet this provision, some jurisdictions have not viewed this issue as covered by 90.4. Instead, some authorities having jurisdiction (AHJs) have misunderstood the requirement and ruled that, in the absence of available products, all ac cables must be installed in a raceway. Since most small modular inverters have no means of being installed in raceway systems, this has created yet another set of field problems for contractors and enforcement.

At the time this was introduced to the 2014 NEC, it was discussed that exposed 240-volt ac exposed cable systems may be as likely to cause an arcing fire as 80-volt dc circuits. There is no field experience or data with PV systems that suggests that this assumption is true. Until such time that an actual field problem is identified with these circuits that requires such arc-fault detectors, it is recommended to set aside this requirement due to the problems with supply and enforcement.

Once CMP4 became aware of the problems with 705.12(D)(6), there was unanimous approval to remove Section 705.12(D)(6) from the first and second revisions of the 2017 NEC. As more and more jurisdictions begin to enforce the 2014 NEC, it is critical that this TIA be approved and that contractors and enforcement have a definitive response from NFPA and CMP4 that there is no intention to pursue this provision at this time.

Temporary Interim Amendment (TIA) No. 14-11 was issued to correct a circumstance in which the revised NFPA Standard had resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification for the action. Given the fact that CMP4 voted unanimously to remove 705.12(D)(6) from the 2017 NEC, timely action is necessary to prevent confusion for contractors and enforcement working with the 2014 NEC. Without a TIA, it is very likely that the same confusion that has persisted in markets where the 2014 NEC has already been adopted, will sweep to the other jurisdictions that are just now trying to understand NEC changes from the 2011 to 2014 versions.

National Fire Protection Association (NFPA) Amendment to 2014 NEC:

Delete 705.12(D)(6) in its entirety:

~~(6) Wire Harness and Exposed Cable Arc-Fault Protection. A utility-interactive inverter(s) that has a wire harness or cable output circuit rated 240 V, 30 amperes, or less, that is not installed within an enclosed raceway, shall be provided with listed ac AFCI protection.~~

The complete substantiation may be found on NFPA's website:

http://www.nfpa.org/assets/files/AboutTheCodes/70/TIA_70_14_11.pdf

IV. TIA #14-12 2016 National Electrical Code, Article 705, Section 705.12(D)(2)(3)(e):

“Point of Connection” (Allowable current for center-fed panelboards with PV interconnection)

The NFPA issued TIA #14-12 modifying Section 705.12 to clarify the requirements for PV interconnection in center-fed panel boards in dwellings, as follows:

1. PV interconnection is allowed at either end of the busbar (but not both)
2. 125% of the PV output circuit current
+ The rating of the OCPD protecting the busbar
DOES NOT exceed 120% of the busbar's current rating

Section 705.12(D)(2)(3)(e) now reads:

(e) A connection at either end, but not both ends, of a center-fed panelboard in dwellings shall be permitted where the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar does not exceed 120 percent of the current rating of the busbar.

Background:

Due to ambiguity in earlier code, there has been a lack of consensus on how to enforce PV interconnection to busbars of center-fed panelboards in dwellings. This has inadvertently caused panelboard upgrades on several thousand homes with PV systems. These panelboards were otherwise in good mechanical condition and in no immediate need of replacement for any other reason than to comply with 705.12(D)(2)(3). In the 2017 NEC, the allowance for 120% of busbar rating for center-fed panelboards in dwellings was approved.

National Fire Protection Association (NFPA) Amendment to 2014 NEC:

Add new 705.12(D)(2)(3)(e):

(e) A connection at either end, but not both ends, of a center-fed panel board in dwellings shall be permitted where the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar does not exceed 120 percent of the current rating of the busbar.

The complete substantiation may be found on NFPA's website:

http://www.nfpa.org/assets/files/AboutTheCodes/70/ProposedTIA_1234_NFPA%2070.pdf

The California Building Standards Commission, in coordination with the Solar Energy Action Committee (SEAC) (www.seacgroup.org), developed this information bulletin as well as the background material that supports the need for these TIA amendments with the intent of statewide distribution via the IB process to coincide with the January 1, 2017 effective date of the 2016 Building Standards Codes, Title 24, California Code of Regulations.

To purchase the 2016 California Electrical Code, visit the following location:

- National Fire Protection Association (NFPA) – BNI Publishers at:
<http://www.bnibooks.com/>
Telephone: 888-264-2665
(Publishes Part 3 of Title 24)

Questions regarding the Tentative Interim Amendments should be directed to the National Fire Protection Association (www.nfpa.org). Questions specific to this bulletin should be directed to this office at (916) 263-0916 or via E-mail at cbsc@dgs.ca.gov.



Michael L. Nearman
Deputy Executive Director