

Tentative Interim Amendment (TIA) Request Form

Submitter's Information

Name: Click here to enter text.

Affiliation: (Technical Committee, company, organization): Click here to enter text.

Address: Click here to enter text.

City: Enter City.

State: Enter State

Zip: Enter Zip

Email Address: Click here to enter text.

Date: Click here to enter a date.

Proposed TIA Information

NFPA Standard No.: 70

Editions affected (Current and/or Proposed): 2017

Proposed text of the TIA (wording to be added, revised, how to be revised, or deleted): [Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

Proposed text of the TIA (wording to be added, revised, how to be revised, or deleted):

Section 840.2 Definitions

Insert the following new definition and Informational Note.

Nominal Current. The designated current per conductor as specified by equipment design.

Informational Note: One example of nominal current is 4-pair Power over Ethernet (PoE) applications based on IEEE Std 802.3-2015, IEEE Standard for Ethernet, that supplies current over 2 or 4 twisted pairs. The nominal current for 60 watt PoE power sourcing equipment is 0.3 amperes per conductor, where the current in one conductor can be 0.36 amperes and another conductor can be 0.24 amperes.

Section 840.160 Powering Circuits. Communications cables, in addition to carrying the communications circuit, shall also be permitted to carry circuits for powering communications equipment ~~Where the power supplied over a communications cable to communications equipment is greater than 60 watts, communication cables and the power circuit~~ Installations of listed communications cables shall comply with 725.144 where listed communications cables are used in place of Class 2 and Class 3 cables.

Exception: Compliance with 725.144 shall not be required for installations of listed 4-pair communications cables where the nominal current does not exceed 0.3 amperes in any conductor.

Statement of the problem and substantiation for the TIA

The existing text requires compliance with 725.144 when the power supplied is over 60 watts. Panel 16 based this on the assumption that the voltage was always 50 volts and all 8 conductors were used for the power as described in the *UL/SPI Fact Finding Report on Power over Local Area Network Type Cables (4-Pair Data / Communications Cables) <with errata 1 revisions>*, dated September 25, 2015

(<http://www.plasticsindustry.org/sites/plastics.dev/files/SPI%20Fact%20Finding%20Report%20%28Issued%202015-09-25%29%2BErrata%201%C2%A9UL%26SPI.pdf>). The existing text would allow systems which deviate from these assumptions (e.g., supply 24 volts or supply only on 2 conductors) to operate with currents greater than 0.3 amperes per conductor, and possibly result in the overheating that 725.144 was meant to avoid. Additionally, the proposed text clarifies that it is the cable installation that generally must comply with 725.144. The proposed exception clearly states that deviation from wiring in accordance with 725.144 is only permitted for listed 4-pair communications cables, and only when the nominal current does not exceed 0.3 amperes in any conductor. The exception is based on the UL/SPI Fact-Finding investigation which showed that all the configurations tested did not overheat (exceed the cable temperature rating) when all the conductors carried 0.3 amperes. 60 watts is equivalent to 0.3 amperes in a typical Power over Ethernet (PoE) powering scheme when a 50 volt, 8 conductor power source is used.

The new definition, “Nominal Current” is necessary to account for deviations in conductor current due to circuit imbalances. The identical definition is also included in a TIA for 725.2 in a companion submission. These deviations are found in commonly deployed systems. The new definition is necessary to avoid adverse impact on the existing PoE systems. These PoE systems exhibit some level of current imbalance, making a strict ‘maximum current’ limit at 0.3 amperes impractical, causing them to fail the exemption because one conductor may carry slightly greater than 0.3 amperes while another less. ‘Nominal current’ eliminates this impact, as described in the informational note. Panel 16’s existing text for 840.160 attempted to provide an exception for systems at 0.3 amperes or less, for which there are no demonstrated safety concerns. However, the text in 840.160 inadvertently used only the power and not current to provide an exception, an issue corrected in this TIA. The use of maximum current in 725.144 and the lack of any current level below which there is an exception is inconsistent with the treatment of existing low-power devices in 840.160. The Informational Note further clarifies the term “Nominal Current” by providing an example of a common powering arrangement and identifies permissible current imbalances per industry-accepted standards which relate to the impacted systems.

The NEC Correlating Committee, at the direction of the NFPA Standards Council, formed the Power over Ethernet Task Group (PoE Task Group) to address issues regarding the provision of power over Ethernet and communications conductors. Members of the PoE Task Group, including members of NEC Panel 3, NEC Panel 16, and the NEC Correlating Committee, are as follows: E. Gallo – Chair, M. A. Cardona, W. J. McCoy, R. Kusuma, R. Emplit, R. Foster, S. Kaufman, M. Shariff, A. Tassone, G. Straniero, J. Kacperski, R. Ivans, T. Pope, T. C. Coleman, J. Brunssen, J. Goergen, G. A. Zimmerman, M. W. Earley, M. J. Johnston, L. Ayer, P. Vanderlaan, R. Anderson, C. Bullock, S. Stene, M. Ode, and T. Olechna. The PoE Task Group prepared this TIA. In accordance with the Standards Council’s instructions, the task group was broad based and specifically included representation of those with knowledge and experience in telecommunications and Ethernet communications.

Emergency Nature of the Proposed TIA*

Select one or all that apply as to why you believe the TIA is of an Emergency Nature:

- The standard contains an error or an omission that was overlooked during the regular revision process.
- The NFPA Standard contains a conflict within the NFPA Standard or within another NFPA Standard.
- The proposed TIA intends to correct a previously unknown existing hazard.
- The proposed TIA intends to offer to the public a benefit that would lessen a recognized (known) hazard or ameliorate a continuing dangerous condition or situation.
- The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public.

- The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has 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.

***NOTE: a TIA cannot be processed without identification of Emergency Nature above.**

Detailed basis supporting that the TIA is of an Emergency Nature requiring prompt action:

The existing 840.160 exception allows sources providing 60 watts of power without any current limit. This creates a safety issue constituting an emergency, because it allows sources supplying up to 60 watts at less than 50 volts or over fewer than 8 conductors, which would result in higher currents than intended, and possible overheating. For example, a 12 volt source might provide 1.25 Amperes per conductor under the existing text, which would result in overheating described in the UL/SPI report and codified in 725.144. Such high current systems are available today. Panel 16 created this exception to allow for low-current PoE systems deployed in the hundreds of millions over the past decade. Because these systems may supply slightly more current on one conductor than another, maintaining safety, yet, exceeding a fixed current threshold on any single conductor, the exemption needs to be restated in terms of 'nominal current', defined here.

Additional Requirements

Please provide the written agreement of at least two members of the involved Technical Committee or Correlating Committee to the processing of the TIA. The agreement to the processing of the TIA is for the sole purpose to allow the TIA to be processed and does not imply support for the proposed text or emergency nature of the TIA.

**Mail to: Secretary, Standards Council • National Fire Protection Association
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