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# MEMORANDUM

**TO:** Code-Making Panel 9

**FROM:** Sarah Caldwell, *Committee Administrator*

**DATE:** May 25, 2022

**SUBJECT:** NEC® Proposed TIA No. 1649 **PRELIMINARY TC BALLOT RESULTS**

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According to Section 5.6(a) in the NFPA *Regs*, the preliminary results show this TIA **HAS** achieved the ¾ majority vote needed on both Ballot Item No. 1 (**Technical Merit**) and Ballot Item No. 2 (**Emergency Nature**).

**14** **Eligible to Vote**
**1** **Not Returned** (*Simister*)

| **Technical Merit:** | | **Emergency Nature:** | |
|---|---|---|---|
| 0 | Abstentions | 0 | Abstentions |
| 11 | Agree (w/comment: *Hartwell*) | 11 | Agree (w/comment: *Hartwell*) |
| 2 | Disagree (*Osborne, Sasso*) | 2 | Disagree (*Osborne, Sasso*) |

There are two criteria necessary to pass ballot [(1) simple majority (2) affirmative ¾ vote]. Both questions must pass ballot in order to recommend that the Standards Council issue this TIA.

(1) In all cases, an affirmative vote of at least a simple majority of the total membership eligible to vote is required.
[14 eligible ÷ 2 = 7 + 1 = **(8)**]

(2) The number of affirmative votes needed to satisfy the ¾ requirement is **10**.
(14 eligible to vote - 1 not returned - 0 abstentions = 13 × 0.75 = 9.75)

Ballot comments are attached for your review.

This proposed TIA has been published for public comment in the May 2022 issue of *NFPA News* with a Public Comment Closing Date of June 22, 2022. Any public comments received will be circulated to the committee. The Standards Council will consider the issuance of this TIA.

**NFPA 70®-Proposed 2023 Edition**
***National Electrical Code®***
**TIA Log No.: 1649**
**Reference:** 314.29(A)
**Comment Closing Date: June 22, 2022**
**Submitter:** Frederic Hartwell, Hartwell Electrical Services, Inc.
www.nfpa.org/70

*1. Revise paragraph 314.29(A) to read as follows:*

**314.29 Boxes, Conduit Bodies, and Handhole Enclosures to Be Accessible.** Boxes, conduit bodies, and handhole enclosures shall be installed so that wiring and devices contained in the boxes, conduit bodies, or handhole enclosures can be rendered accessible in accordance with 314.29(A) and (B).

**(A) In Buildings and Other Structures.** Boxes and conduit bodies shall be installed so the contained wiring and devices are accessible. Boxes and conduit bodies that are recessed into or behind finished surfaces of buildings shall have access to their internal contents maintained by openings in their covers and in the building finish that comply with 314.29(A)(1), (A)(2), or (A)(3) as applicable. Removable finished covers that maintain this access shall be permitted.

**(1) Boxes 1650 cm$^3$ (100 in.$^3$) or Less in Size.** The openings, if reduced from the outer walls of the box, shall be centered not more than 25 mm (1 in.) from the centerline of the box, and shall not extend beyond the walls of the box. If rectangular, the opening shall be not less than 73 mm (2 7/8 in.) by 45 mm (1 3/4 in.) in size. If circular, the opening shall not be less than 90 mm (3½ in.) in diameter.

**(2) Boxes Larger Than 1650 cm$^3$ (100 in.$^3$) in Size.** The openings shall not be smaller than the outer walls of the box.

**(3) Conduit Bodies.** The openings shall not be smaller than outer walls of the conduit body.

**(B) Underground.** Underground boxes and handhole enclosures shall be installed …

**Substantiation**: The creation and marketing of devices designed to mount in front of the outlet boxes that contain their electrical supply has recently come to the attention of the submitter. The outlet boxes are recessed entirely behind the building surfaces, with a cylindrical hole cut into the building surface to match the hole in a mounting plate that attaches to the box. The hole diameters are 36.5 mm (1 7/16 in.), sized to receive the actual devices. The device exteriors consist of nonmetallic barrels that engage mating surfaces manufactured as part of the mounting plates. The devices can be removed through the use of a cylindrical extraction tool that closely envelops the outer margin of the cylindrical device, and that in so doing spreads the interior locking tabs, which in turn enables the extraction of the devices, one at a time, after it is pushed into position.

This means that there is little meaningful access to the box interior after the surface material is applied. As noted, the devices can be removed, but the box interior is only viewable to the minimal extent that it can be seen through the finished hole. The surface treatments supported by the system run from 6 mm (1/4 in.) through 19 mm (3/4 in.) and up to 32 mm (1¼ in.), which results in a significant reduction in visibility into the box, especially relative to required

equipment grounding connections to the box and also the mechanism for branch-circuit cable and/or raceway securement to the box itself.

An installation video provided by one manufacturer, however inadvertently, demonstrates these shortcomings convincingly. It shows the application of the special tool that allows for the extraction of the wiring device from the wall, with the device bringing with it branch circuit conductors attached to the wire leads from the device with twist-on wire connectors. As the device is drawn away from the wall, the branch-circuit conductors follow it, eventually bringing into view what appears to be an NM cable sheath. The entire cable assembly then begins to move out of the wall. This intersects with the installation advice (advice, not a requirement) that only one wire (obviously intended as meaning one cable assembly) be present in the box. It is also apparent that that cable assembly is not secured to the box, and that a significant amount of cable slack has been arranged ahead of the box, in order to support the withdrawal from the wall that allows for inspection and maintenance to be done as required to the supply connections. The video also implies (but does not state) that wiring methods other than Type NM cable should not be used. In fact, the intact cable assembly exiting the box shows no sign of the required equipment grounding connection to the box having been made, although the installation guidance from one manufacturer for single device applications specifies a steel outlet box.

The NEC has required access to boxes for about 100 years. What is now 314.29(A) originally only applied to junction boxes, however, the access rule was extended to outlet boxes 60 years ago, in the 1962 NEC. These devices and their mounting provisions obstruct access to and the ability to inspect boxes behind surface treatments. This approach eviscerates the six-decade requirement for access to outlet boxes, because a box in an admittedly known location whose contents cannot be viewed short of removing the building surface is one that effectively contravenes key safety objectives in the access rules. Electrical components that cannot be viewed cannot be maintained.

CMP 1 has rewritten the definition for accessible for the 2023 edition to further strengthen its terms, now including the word “blocked” along with the prior wording “closed in by the structure or finish of the building.” This system clearly blocks access to the box, and therefore will even more certainly fail the accessibility test.

**Emergency Nature:** The proposed TIA intends to correct a previously unknown existing hazard.

This product line raises serious safety and enforcement concerns, particularly as it directly conflicts with new wording in Art. 100 for the term “Accessible (as applied to wiring methods).” CMP 9 has amended 314.29 for the 2023 NEC by removing former language that duplicated some of the Art. 100 definition, in favor of a straightforward requirement for accessibility. This makes the full application of that definition crucial for proper enforcement. At least some devices in this product line have received a product listing, which complicates the ability of the inspection community to regulate them. This TIA provides clear and easily enforceable statements as to how large an opening is considered to afford the required interior access, together with allowances for different shapes and a moderate degree of centerline offset, all of which accommodate long-standing standard plaster ring and related cover designs.

NEC TIA No. 1649 Ballot Preliminary Report
Election:70_A2022_NEC_P09_Log1649_TIABallot
Results by Revision

**QUESTION NO. 1: I AGREE with the TECHNICAL MERITS of the Proposed TIA Log No. 1649 to Revise paragraph 314.29(A).**

**Eligible to Vote: 14**
**Not Returned : 1**
Michael Simister

| Vote Selection | Votes | Comments |
|---|---|---|
| **Agree** | 11 | |
| Carmon A. Colvin | | Agree |
| Rodney D. Belisle | | Agree |
| Richard Hollander | | I AGREE |
| David R. Carroll | | agree |
| Frederic P. Hartwell | | As the TIA submitter, my reasons for an affirmative vote are provided in detail within the substantiation as submitted. In partial response to a negative vote, it should also be noted that the reason for the requirement for full access to the entire perimeter of pull and junction boxes, and of conduit bodies, is that these enclosures are primarily sized for wire pulling, often very large conductors, and they are sized by rules in 314.26 and not by volume. As such, the entire enclosure must remain accessible in order to preserve their intended function. |
| Lou Grahor | | I agree with the technical merits |
| Ryan Parker | | Agree |
| Paul B. Sullivan | | Agree |
| Ronnie H. Ridgeway | | Agree- Technical Merits |
| George Smith | | Agree |
| Timothy James Schultheis | | Agree |
| **Disagree** | 2 | |

| | | |
|---|---|---|
| Nick Sasso | | Too cumbersome. I agree in principle, and I agree that the "receptacle system" as shown in the video does not provide access. The proposed language is far too cumbersome and difficult to interpret. We may need language similar to 314.72(C) and/or 314.72(D): ========== 314.72 Construction and Installation Requirements. (C) Complete Enclosure. Boxes shall provide a complete enclosure for the contained conductors or cables. (D) Wiring Is Accessible. Boxes and conduit bodies shall be installed so that the conductors are accessible without removing any fixed part of the building or structure. Working space shall be provided in accordance with 110.34. (but we need something like this for 1000-volts or less). ========== Or, another alternative would be to add three little words: "THAT," "BOX," and "AND," to 314.29(A): 314.29 Boxes, Conduit Bodies, and Handhole Enclosures to Be Accessible. Boxes, conduit bodies, and handhole enclosures shall be installed so that wiring contained in them can be rendered accessible in accordance with... (A) In Buildings and Other Structures. Boxes and conduit bodies shall be installed so THAT the BOX AND contained wiring can be accessed without removing any part of the building or structure. ========== Also the logic is flawed in that the proposed language for the larger box, the openings shall not be smaller than the outer walls of the box... but for the smaller box, the openings are allowed to be reduced... |
| Robert D. Osborne | | This TIA is based on the submitters objections to a specific product on the market. It would result in very prescriptive requirements that institute a new benchmark for accessibility that hasn't benefited from real-time debate with the experts on CMP 9. Merits of the proposal, and those of the design of the specific product, should be reviewed as part of a Public Input, and vetted through the normal review process. As noted in comments regarding "Emergency Nature", revision of the Code through the TIA process is not warranted. |
| **Abstain** | 0 | |

**QUESTION NO. 2: I AGREE that the subject is of an EMERGENCY NATURE for one or more of the reasons noted in the Instructions box.**

**Eligible to Vote: 14**
**Not Returned : 1**
Michael Simister

| Vote Selection | Votes | Comments |
|---|---|---|
| **Agree** | 11 | |
| Carmon A. Colvin | | Agree |
| Rodney D. Belisle | | C. The proposed TIA intends to correct a previously unknown existing hazard |
| Richard Hollander | | "C" |
| David R. Carroll | | agree |
| Frederic P. Hartwell | | CMP 9 members as well as the public should be aware that my bar for TIAs is very high. It has been almost 34 years since CMP 9 processed a TIA, with nary a single one being previously processed during my 32 years on the panel. The practice addressed here stands many, many decades of accepted practice on its head; it is unsafe, and the practice should not await the release of the 2026 NEC for a CMP 9 response. This TIA provides that vehicle. |
| Lou Grahor | | I agree that the subject is of an emergency nature |
| Ryan Parker | | A, C, D, and F |
| Paul B. Sullivan | | C |
| Ronnie H. Ridgeway | | Agree - Emergency Nature (C) The proposed TIA intends to correct a previously unknown existing hazard. |
| George Smith | | C. The proposed TIA intends to correct a previously unknown existing hazard. |
| Timothy James Schultheis | | Agree, C - this presents a problem with a previously unknown hazard. |
| **Disagree** | 2 | |
| Nick Sasso | | I haven't seen that product being used anywhere and I think most builders would hesitate to provide "less" than a duplex receptacle. It would also be problematic if an electrician had to return and add wiring / modify something. So I don't see the new product as being widely used and I don't see this as being of an emergency nature, at least at this time. |

| | | |
|---|---|---|
| Robert D. Osborne | | The product in question has been certified since 2014. The submitter doesn't identify instances where installations over the course of the past 8 years have resulted in any safety incidents attributed to the design or installation. Accessibility to wiring and devices is a known hazard and is already addressed in the Code. Adding additional prescriptive requirements in an attempt to place tighter controls over what is considered "accessible", esp. based on the review of a singular product which has been in the marketplace for many years, is not an "emergency". |
| **Abstain** | 0 | |

**A. The standard contains an error or an omission that was overlooked during the regular revision process.**

**B. The NFPA Standard contains a conflict within the NFPA Standard or with another NFPA Standard.**

**C. The proposed TIA intends to correct a previously unknown existing hazard.**

**D. 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.**

**E. 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.**

**F. 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.**