FORM FOR COMMENT FOR 2014 NATIONAL ELECTRICAL CODE®

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Type or print **legibly**. Use a separate copy for each comment. Limit each comment to a **SINGLE** section. All comments **must be received by NFPA by 5 p.m., EDST, Wednesday, October 17, 2012**, to be considered for the 2014 National Electrical Code. Comments received after 5:00 p.m., EDST, Wednesday, October 17, 2012, will be returned to the submitter.

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Date 15 OCT 2012 **Name** JOHN C. WILES, JR. **Tel. No.** 575-646-6105

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Please indicate organization represented (if any) PV INDUSTRY FORUM

1. **Section/Paragraph** 690.31(C)(1)
2. **Comment on Proposal No. (from ROP):** 4-290
3. **Comment recommends (check one):** ☒ new text ☐ revised text ☐ deleted text
4. **Comment (include proposed new or revised wording, or identification of wording to be 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 *(Modified from Proposal 4-290)*:

PV source circuits and PV output circuits using single-conductor cable listed and labeled as PV wire of all sizes with or without a CT marking/rating shall be permitted in cable trays provided the cables are secured and supported in accordance with 338.10(B)(4)(b) and are not on or penetrating a building. PV systems using cable trays on buildings must comply with 392.

5. **Statement of Problem and Substantiation for Comment:** (Note: State the problem that would be resolved by your recommendation; give the specific reason for your Comment, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

We want to thank the CMP for considering Proposal 4-290 and request that the proposal be reconsidered. The CMP was concerned about Cable Trays being limited to Industrial Establishments in its Panel Statement. As Jim Rogers pointed out in his comment, this was a misunderstanding. The permissibility of Cable Trays outside of Industrial Establishments is directly addressed in 392.10, which states "… Cable tray installations shall not be limited to industrial establishments …" Nonetheless, after discussing the proposal with representatives of Code Making Panels 7 and 8 as suggested by Jim Rogers, we have modified the proposed modification to streamline the revision request and better align the language with the NEC style and language requirements.

In an attempt to reduce the impact of the requested revision, we have modified the proposed language to reduce its scope to PV Wire only. Also, we have focused the language on permitting the use of these cables in ground mount systems only (systems not on or penetrating a building) and have eliminated the cable tray fill and conductor ampacity guidelines. We have also made it very clear that the cables must continue to meet the support requirements that are currently required in 33810(B)(4)(b). Given that cable trays provide a superior protection and support for the PV Source circuits relative to what is already required in 690, we ask that the CMP reevaluate this proposal and adopt the streamlined language proposed in this comment.

As additional background information, it became clear during conversations with CMP 4 representatives that the problem being addressed by this revision was not well understood. Based on the Working Group's experience with designing ground mount PV systems, AHJ's have difficultly interpreting the NEC requirements for installing single conductor PV Wire cables smaller than #1/0 AWG in cable trays. The difficulty is that section 392 does NOT address installation of single conductor cables smaller than #1/0AWG in cable trays, suggesting that it is not permitted. Similarly, the TC ratings in the standards are not available for single conductor cables smaller than #1/0AWG. Using this line of reasoning, AHJs sometimes reject installing these cables in cable trays. On the other hand, the NEC permits the use of USE-2 or PV wire in PV systems (exposed, outdoor environments 690.31(B))

because these cables are designed for outdoor use. Furthermore, the support requirements for USE cables in exterior locations is only every 4.5 feet as defined in 334.30, which is referenced by 338.10(B)(4)(b). All cable tray designs are superior to both of these conditions in that they provide protection from physical damage for these cables and the maximum support spans are much less than 4.5 feet. As a result, AHJs often approve the use of cable trays in this application. As a PV System design, this uncertainty and contradiction in the NEC adds unnecessary complexity to the design process. Thus, we ask that the CMP revise 690 to resolve this contradiction.

From an engineering standpoint, we learned from conversations with UL representatives that the #1/0 AWG single conductor restriction was imposed long before our application was envisioned. Additionally, the TC rating deals with spread of flame prevention, which is required for applications inside of buildings. Since the PV Wire standard already includes a flame resistance test, the TC rating adds no value for ground mount PV systems. The TC spread of flame test was designed to prevent cable trays that pass through firewalls from allowing a fire to breech the firewall. Clearly, this requirement is not needed for ground mount PV systems. By eliminating the TC requirement for ground mounted PV systems, it would allow PV Wire cables smaller than #1/0 AWG, which are outside of the scope of the TC standard, to be installed in cable trays. Lastly, ladder style cable trays have rung spacings ranging from 6" to 18", with spacings between 6" and 12" typically being used for PV systems. Thus, the support provided to the cables in a cable tray is vastly superior to the requirements stipulated in 334.30.

6. Copyright Assignment

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(b) ☐ Some or all of the text or other material proposed in this Comment was not authored by me. Its source is as follows:
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Signature (Required) John C. Wiles, Jr.

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10/15/2012