

FORM FOR COMMENT FOR 2014 NATIONAL ELECTRICAL CODE®

INSTRUCTIONS — PLEASE READ CAREFULLY

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.

For technical assistance, please call NFPA at 1-800-344-3555.

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Log #: _____

Date Rec'd: _____

Please indicate in which format you wish to receive your ROP/ROC electronic paper download
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***If you wish to receive a hard copy, a street address **MUST** be provided. Deliveries cannot be made to PO boxes.

Please indicate organization represented (if any) PV INDUSTRY FORUM

1. Section/Paragraph 690.41

2. Comment on Proposal No. (from ROP): 4-307

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~~).

Replace the text of 4-307 with the modified text as shown:

~~690.41 System Grounding. For a photovoltaic power source, systems shall comply with 690.35, or one conductor of a 2-wire system with a photovoltaic system voltage over 50 volts, but not greater than 300 volts, and the reference (center tap) conductor of a bipolar system shall be solidly grounded or shall use other methods that accomplish equivalent system protection in accordance with 250.4(A) and that utilize equipment listed and identified for the use. [ROP 4-307]~~

690.41 System Grounding. Photovoltaic systems shall comply with one of the following:

- (1) Ungrounded systems shall comply with 690.35 or
- (2) Grounded 2-wire systems shall have one conductor grounded or be impedance grounded, and the system shall comply with 690.5 or
- (3) Grounded bipolar systems shall have the reference (center tap) conductor grounded or be impedance grounded, and the system shall comply with 690.5 or
- (4) Use other methods that accomplish equivalent system protection in accordance with 250.4 (A) with equipment listed and identified for the use.

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.)

The reformatting as a numbered list is in response to the TCC request.

Sentence structure was modified to create parallel construction per the NEC Style Manual.

Restricting PV systems operating over 300 volts to have only ungrounded PV arrays is unnecessary for improved safety and imposes severe constraints on the design and development of future (demand response, intelligent) PV systems where other renewable resources will be interacting with PV. The US has successfully

and safely operated grounded electrical systems at 600 volts and higher for more than a century. Safety issues in grounded PV systems are being addressed in both the UL Standards and in other sections of the NEC.

This restriction, if instituted, would prevent the use of one of the more widely installed, highest efficiency PV modules in the world. Both small residential and large commercial installations would be impacted with no improvements in safety. Technology versus Safety would likely be compromised because additional less-efficient modules would have to be installed decreasing safety (both roof and electrical) and system reliability could be compromised.

The reference to “over 50” volts has been deleted since the list now includes all types of systems at any voltage.

Removing the “solidly” requirement makes the Code language consistent with the PV inverters and other equipment that is manufactured and listed to UL Standards where an overcurrent device is allowed to make the dc grounding bonding jumper as a part of the NEC required ground fault protection device.

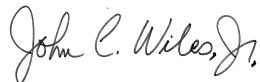
Adding the allowance for impedance grounding and the reference the 690.5 adds clarity when grounded 2-wire and bipolar PV systems are installed.

6. Copyright Assignment

- (a) I am the author of the text or other material (such as illustrations, graphs) proposed in the Comment.
- (b) Some or all of the text or other material proposed in this Comment was not authored by me. Its source is as follows: (please identify which material and provide complete information on its source)

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Signature (Required)



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