

Comments on NECA 412, Standard for Installing Photovoltaic Power Systems

E: editorial, T: technical, G: General

ID: Company with comment # (do not automate comment #)

Please do not re-size table

Page	Line	Clause	E/T/G	Organization	Comment (rationale)	Proposed change (specific; add, delete. From-to)
iv			E	SEIA	This document, nor the NEC, nor any other single standard cannot provide adequate scope and details to allow for all products in the market. Manufacturer's listed product instructions should trump all other guidelines as they do in the NEC. This should be highlighted here to reinforce this especially since this industry and products are evolving at a rapid rate. It is especially important as these guidelines are very general, and only cover fairly "generic" PV system mounting hardware.	Add text: "Solar photovoltaic power systems should be installed in accordance with NECA 412-201x, <i>Standard for Installing Photovoltaic Power Systems</i> (ANSI), and with all manufacturer's listed safety and installation instructions. In the case of conflict, refer to the manufacturer's listed safety and installation instructions. "
16	41-43		T	SEIA	This text is not required and may be confusing. The next paragraph states that automatic disconnection is required in listed UL inverters. NEC and most all utility interconnection requirements do not require additional means of automatic disconnect. Not mentioning it here does not restrict a utility from asking for additional means but it will prevent the confusion probable in the current language that suggests that a separate device is what is need to prevent backfeed during outage. Section 5 contains clear text regarding inverters and protection from islanding etc.	Delete text: "Utility interconnection requirements may include additional disconnecting means that are accessible to utility company personnel, labeling, metering, overcurrent protection, and automatic disconnection to prevent the solar power system from backfeeding the utility during an outage, among others."
18	25		T	SEIA	For clarification.	Add text: "Fixed mount solar arrays may be attached to a dedicated foundation or existing structure or may be held in place with ballast. (Non-penetrating solar mounting systems mounted on commercial flat roofs are an example of a ballasted system.)"
19	9		T	SEIA	For clarification.	Add text: "Sharp edges of solar photovoltaic equipment and components, and exposed fastener tips..."

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19-20			T	SEIA	<p>A reference to the NFPA-1 and the International Fire Code would provide more clarity than the general fire clearance rules provided here. Duplicated rules that are simplified for this document may be in conflict or confuse IFC rules.</p> <p>Specific provisions have been included in the 2012 International Building Code, scheduled to be published in April 2012. In the meantime, please refer to the California Department of Forestry and Fire Protection's Solar Photovoltaic Installation Guidelines.</p>	
20	12		T	SEIA	<p>The current text is inaccurate. While conduits and other penetrations may be required, there are many non-penetrating roof mounting systems that do not require penetrations for structural support.</p>	<p>Add text: Because some applications of roof-mounted solar panels require mounting holes through the roof, the best time to install these types of roof-mounted solar panels is during the installation of the roof. Some solar panel mounting systems do not require penetrations through the roofing membrane and can be removed to allow for re-roofing.</p>
21	3-4		T	SEIA	<p>This text is unnecessary and inaccurate.</p>	<p>Delete text: "and are typically used for smaller photovoltaic power systems."</p>
34	2		T	SEIA	<p>For clarification.</p>	<p>Add text: "Arrange the connections to solar modules or panels so that removal of a module or panel from a two PV source circuit does not interrupt a grounded conductor or neutral to other PV source circuits during operation. Note that during construction, service, or maintenance it may be necessary to temporarily open grounded circuits but these circuits should not be left in an open state."</p>
35	Fig. 7.1.3		T	SEIA	<p>Figure 7.1.3 shows breaker connected to bus bars at same end as feed conductors. This is not generally in compliance with NEC requirements.</p>	<p>Modify diagram to be compliant with NEC requirements.</p>

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36	2-13		G	SEIA	The current language requires arc-fault devices but there are no listed devices to use at this time. This should be mentioned here.	Add text: Note at the time of publication, there are no listed devices for this purpose.
37	11-20		G	SEIA	The current language is a very oversimplified and somewhat inaccurate discussion of optimum orientation, tilt angle, and costs / benefits of tracking. The text should include the caveat that these are only the basic considerations and that the optimal system design may differ when considering specific site conditions and mounting technologies.	Add text: The above provisions are only basic considerations. Optimal system design may differ when considering factors including, but not limited to, site condition, mounting technologies, and specific products.
38	1-25		G	SEIA	The current language is a very oversimplified and somewhat inaccurate discussion of optimum orientation, tilt angle, and costs / benefits of tracking. The text should include the caveat that these are only the basic considerations and that the optimal system design may differ when considering specific site conditions and mounting technologies.	Add text: The above provisions are only basic considerations. Optimal system design may differ when considering factors including, but not limited to, site condition, mounting technologies, and specific products.
39	6-7		T	SEIA	For clarification.	Add text: “Do not attach mounts and supports directly to the plywood sheathing of the roof unless the mounting systems are specifically designed to be attached directly to the plywood sheathing, in accordance with manufacturers installation instructions.”
42	7-9		T	SEIA	For clarification.	Add text: The maximum number of PV system disconnecting means for any combined source circuit is limited to not more than six switches or circuit breakers mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard”

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43	17-23		T	SEIA	For clarification.	Add and Delete text: In the case where a fused disconnect switch is used on a solar photovoltaic power system, the fuses may remain energized due to a backfeed when the switch is opened. In this case, a means of PV output circuit disconnect should be provided is required to disconnect the fuses from the backfeed source of energy. This disconnecting means must be within sight of and accessible to the location of the fuse or integral fuse holder. A touch-safe fuse holder which isolates the fuse from both energized conductors is an acceptable means of disconnect."
44	23-24		T	SEIA	The current text is not supported by the NEC. The suggested text adds an important NEC exception.	Add and Delete text: "The DC disconnect must be installed in a readily accessible location at the point where the DC conductors from the solar array first penetrate the structure unless the conductors are run in metallic conduit, raceway, or metallic cables as listed in NEC 690."
47	30-31		T	SEIA	For clarification.	Add and Delete text: "Single conductor cables, sizes 16 AWG and 18 AWG and larger , that are listed for outdoor use and are sunlight and moisture resistant are permitted for module interconnections"
50	28-30		T	SEIA	For clarification.	Add text. " For PV modules with no factory applied cables or connectors , interconnect solar panels by opening the junction box at the back of each panel and attaching the wires to the appropriate positive and negative terminal screws in the box, removing one-half inch of insulation from the ends of the wires first."

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