State of New Jersey

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DIVISION OF CODES AND STANDARDS
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Acting Commissioner

April 16, 2012

Marcel Renson
Trinity Solar
2211 Allenwood Road
Wall NJ 07719

Dear Mr. Renson:

This is in response to your inquiry regarding the requirements of solar photovoltaic systems and GFPE as specifically asked in the questions below.

Q 1 - When line taps ahead of the main of a service 1000 amps or more does our equipment to also need to be GFPE protected Like the Main Service?

A 1 - Section 690.64(A) permits the point of connection of the solar photovoltaic (PV) system to be ahead of the main building service disconnecting means as per 230.82(6). Section 690.14(A) states that the disconnecting means ***shall not*** be required to be suitable as service equipment but shall comply with 690.17. Section 690.17 has no requirement for the PV system disconnect to be GFPE protected. Section 230.95 states that ground-fault protection of equipment shall be provided for solidly grounded wye electric services of more than 150 volts to ground but not exceeding 600 volts phase-to-phase for each service disconnect rated 1000 amperes or more.
Therefore, the answer is ***NO*** GFPE is required on a disconnect for a PV system tapped ahead of the main building service disconnect since the PV disconnect is not required to be service rated and Section 230.95 ***only*** applies to a solidly grounded wye electric services, which means utility – ***NOT -*** PV systems.

Q 2 – When a solar PV Installation is line tapped in front of the Main Service from the solar disconnect the local inspectors want to use a bonding bushing in our disconnect. Is this required?

A 2 - Section 250.92 pertains to utility electrical services, ***NOT*** PV systems. Section 250.94 is also ***NOT*** applicable. However, 690.3 does state that other articles of the code are applicable unless article 690 states otherwise. Section 250.96(A) would be applicable and if the PV system is over 250 volts to ground then Section 250.97 has requirements that must be complied with for conductors other than service conductors by any of method the methods in 250.92(B), except for (B)(1) which would not be required.

Q 3 - When a Main lug only panel with less than 6 throws is used and a tap ahead of the main with no breaker was 1000 Amp or larger no GFPE would be required?

A 3 - Requires additional information to answer. May be the same as Question 1.

Q 4 – In an installation where a back-fed breaker was installed in a panel and the service was 1000 amps or more, would the breaker require to be GFPE?

A 4 - If you are utilizing Section 690.64(B) by connecting the PV system to the load side of the building service disconnect, then you must address existing equipment that has GFPE, equipment that is being installed with GPFE and where the point of connection will be – this is what 690.64(B)(3) and the Exception are stating.

Q 5 - The NFPA calls Solar PV Installations an interactive sources. Do we need to run a neutral from the service panel to the first disconnect then after that drop the neutral?

A 5 - NFPA should have stated that a PV system is not only an interactive power source but also an alternate power source. The conductors are considered feeders and should comply with the provisions of Sections 215.4, 215.7 and 215.12.

The PV disconnect is not considered a service disconnect even when connected ahead of the building service disconnect. See NEC 230.82. The neutral would not need to be present if there is no connection in the inverter. In fact, GFPE would also not be required even for 1000 amp or more systems because the inverter doesn't have the ability to supply ground fault current. It would be required for inverters with a neutral connection.

I trust this answers your question on this matter. This opinion is, however, advisory in nature and therefore non-biding on any of the parties concerned. Should you be in need of further assistance, please contact me at (609) 984-7609.

Very truly yours,

Suzanne Childers

Suzanne Childers
Code Specialist