



Interpretation

Section 1. Introduction to the National Electrical Safety Code®

Rule 011. Scope
(2012 Edition, pp. 1-4)

Rule 012. General rules
(2012 Edition, p. 4)

(28 May 2013) IR572

Question: An Interpretation from the NESC is requested on the following:

Do Utility Scale Photovoltaic (PV) Generating Stations fall under the purview of the National Electrical Safety Code rather than the National Electrical Code (NFPA-70)?

The Utility Scale PV Generating Stations in question would all have the following characteristics:

- 1) Are of the "free field" or "ground mounted" variety, i.e., the PV modules are installed in large open spaces and not on roofs of residential, commercial or industrial structures whose primary purpose is for something other than strictly supporting the PV modules.
- 2) The Point of Interconnection or Point of Common Coupling between the PV system and the Utility is at voltage level greater than or equal to 12 kV.
- 3) The Point of Interconnection or Point of Common Coupling between the PV system and the Utility is through dedicated electrical switchgear, substation, switchyard or similar methods whose sole purpose is to safely and effectively interconnect the two systems. Any electrical loads connected to said electrical equipment are only used to power auxiliary equipment vital to the generation of the PV power.
- 4) The access to the Generating Stations is limited to Qualified Personnel.
- 5) The access to the Generating Stations by the general public is restricted by a continuous locked fencing system consisting of a minimum height of six feet above ground.

Question 1: Do PV Generation Stations, as described above, meet the definition of a utility?

Question 2: Do PV Generation Stations, as described above, meet the definition of a utility if they only supply power to transmission system utilities or distribution system utilities?



Question 3: Do PV Generation Stations, as described above, fall within the scope of the NESC as defined in Rule 011?

Discussion:

The last several years have seen an exponential increase in the successful adoption of photovoltaic technology in the United States. This fact has enabled the PV industry to scale its research and development to increase overall efficiencies and significantly drive the Levelized Cost of Energy to record lows. Due to the modular nature of PV, the applications can range from powering satellites in space, to residential and commercial use all the way to multi-megawatt systems. Our company alone is constructing two, 550MWac plants in the United States presently. For Utility Scale, investment grade installations, the 2013 price per kWh is nearly at parity with conventional fossil fuel generation methods.

As a direct result of the above, PV has now been widely accepted as a stable, reliable, alternative electrical generation technology by the Utilities engaged in the generation, transmission and sale of electrical energy. The economics are generally based around a minimum of twenty-five years of reliable operation. With such a long term, the oversight by lenders, investment banks, and the off taking utilities is substantial. Many independent engineering firms are engaged in providing oversight during the design, construction, and commissioning of each installation.

One of the constraints to the continued growth of PV in the utility space is the levying of unnecessary codes as detailed below.

The National Electric Code, NFPA 70, Article 690, Solar Photovoltaic (PV) Systems defines the design and installation requirements for PV systems. NEC 690 was written when rooftop PV dominated the market and strict adherence to 690 in Utility Scale Generation Station projects can create unsafe conditions and/or create economic hardship for owners/operators.

Article 690 of the NEC does not differentiate between Utility Scale PV systems and traditional PV systems which could lead an Authorities Having Jurisdiction (AHJ) to the conclusion that all PV systems are within the scope of the NEC.

While it is clear that the scope of the NEC does not extend to Utilities, many large scale PV systems are not constructed or owned by traditional Utilities, which results in local AHJs concluding that the NEC is germane to Utility Scale PV Generating Stations.

Lack of NESC PV specific requirements creates a vacuum that AHJs could incorrectly fill with NEC 690 requirements.

Interpretation

The NESC applies to utility interactive generating systems and their associated step-up substations. The installations that you describe are utility interactive generating systems under the exclusive control of private utilities.

The answer to each of your three questions is “yes.” See NESC Rules 011A1, 011A2, 011A3 and 011A6. See also the following Section 2 definitions:



National Electrical Safety Code®

- generating station (first definition under electric supply station)
- exclusive control of utility
- private utility (second definition under utility)
- utility interactive system

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