National Electrical Safety Code®

Interpretation

Section 11.
Protective arrangements in electric supply stations

Rule 110A General requirements – Enclosure of equipment
(2012 Edition, page 36)
(24 May 2016) IR579

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

Are fences around solar farms required to be grounded by NESC Rules?

Duke Energy owns a solar farm that was designed and built by a firm that designs and builds solar farms. The facilities were designed and installed per National Electrical Code® (NEC®) requirements.

Because the utility owns the solar farm, two questions have been raised about requirements for grounding the fence around the solar farm per the NESC.

Question 1: Because the solar farm was designed and built to NEC requirements, would the NESC grounding requirements apply to the fence even though it is owned by the utility?

Question 2: If the NESC does apply, is it the intent of Rule 110A to require fence grounding when there are no exposed conductors or equipment?

Discussion:

The NESC definition of electric supply stations includes generation stations, and paragraph 1, generation stations, includes solar in the definition.

In section 11, Rule 110A, the following rule requires fences to be grounded:

> "Metal fences, when used to enclose electric supply stations having energized electric conductors or equipment, shall have a height not less than 2.13 m (7 ft) overall and shall be grounded in accordance with Section 9."

Article 250-194 in the NEC (NFPA 70®, 2014 edition) has a similar rule, but it includes the word "exposed" electrical conductors and equipment. This is interpreted to mean no fence grounding is required if there are no exposed electrical conductors or equipment.

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This Interpretation is based on an understanding that your request (1) involves a fence around a utility owned solar farm ("perimeter fence"), (2) the solar panels are enclosed by this fence, and (3) the perimeter fence is the only fence or other means used to enclose the solar panels. See definition of "enclosed." On this basis, the answer to both of your questions is yes.

First question: The NESC grounding requirements apply to the perimeter fence around the solar farm. As stated in your request, solar farms are generating stations by definition. Accordingly, NESC requirements do apply to solar farms, including the perimeter fence. See Rule 011A2, which states that the NESC covers:

> "The generation…of electricity…through public and private utility systems that are installed and maintained under the exclusive control of utilities or their authorized representatives."

Second question: Rule 110A, which was quoted in your request, requires metal fences to be grounded in accordance with Section 9 "when used to enclose electric supply stations having energized conductors or equipment" even where there are no "exposed conductors or equipment." Note that solar panels are "electric supply equipment" (see definition) and that Rule 110A is not limited to "exposed" items.

Rule 110A also states that the grounding shall be done "in accordance with Section 9." In Section 9, Rule 092E covers fence grounding, which states "Fences that are required to be grounded by other parts of this Code shall be designed to limit touch, step, and transferred voltages in accordance with industry practices." A *NOTE* in the rule references IEEE Std 80 as one source for guidance. See also Rule 012C. While a proper engineering study may be used to determine the extent of required grounding, it cannot negate the NESC requirement to ground subject perimeter fence.

Your request does not include consideration of a presumably necessary step-up transformer station and connection to the electrical grid. Such an installation may require a grounded fence and may affect the perimeter fence in question.
