



EXHIBIT 691.1 The Nyngan Solar Farm, Australia. (Getty Images)

Δ 691.4 Special Requirements for Large-Scale PV Electric Supply Stations. Large-scale PV electric supply stations shall be accessible only to authorized personnel and comply with the following:

- (1) Electrical circuits and equipment shall be maintained and operated only by qualified persons.

Informational Note No. 1: See NFPA 70E-2021, *Standard for Electrical Safety in the Workplace*, for electrical safety requirements.

- (2) Access to PV electric supply stations shall be restricted in accordance with 110.31. Field-applied hazard markings shall be applied in accordance with 110.21(B).
- (3) The connection between the PV electric supply station and the system operated by a utility for the transfer of electrical energy shall be through medium- or high-voltage switch gear, substation, switch yard, or similar methods whose sole purpose shall be to interconnect the two systems.
- (4) The electrical loads within the PV electric supply station shall only be used to power auxiliary equipment for the generation of the PV power.
- (5) Large-scale PV electric supply stations shall not be installed on buildings.
- (6) The station shall be monitored from a central command center.
- (7) The station shall have an inverter generating capacity of at least 5000 kW.

Informational Note No. 2: Some individual sites with capacities less than 5000 kW are operated as part of a group of facilities with a total generating capacity exceeding 5000 kW.

Large-scale PV systems are required to be accessible to qualified personnel only. Section 691.9 requires an engineered design installation to have documented procedures and means of isolation of equipment.

691.5 Equipment. All electrical equipment shall be approved for installation by one of the following:

- (1) Listing and labeling
- (2) Be evaluated for the application and have a field label applied
- (3) Where products complying with 691.5(1) or (2) are not available, by engineering review validating that the electrical equipment is evaluated and tested to relevant standards or industry practice

691.6 Engineered Design. Documentation of the electrical portion of the engineered design of the electric supply station shall be stamped and provided upon request of the AHJ. Additional stamped independent engineering reports detailing compliance of the design with applicable electrical standards and industry practice shall be provided upon request of the AHJ. The independent engineer shall be a licensed professional electrical engineer retained by the system owner or installer. This documentation shall include details of conformance of the design with Article 690, and any alternative methods to Article 690, or other articles of this *Code*.

691.7 Conformance of Construction to Engineered Design. Documentation that the construction of the electric supply station conforms to the electrical engineered design shall be provided upon request of the AHJ. Additional stamped independent engineering reports detailing the construction conforms with this *Code*, applicable standards and industry practice shall be provided upon request of the AHJ. The independent engineer shall be a licensed professional electrical engineer retained by the system owner or installer. This documentation, where requested, shall be available prior to commercial operation of the station.

691.8 Direct Current Operating Voltage. For large-scale PV electric supply stations, calculations shall be included in the documentation required in 691.6.

Δ 691.9 Disconnecting Means for Isolating Photovoltaic Equipment. Disconnecting means for equipment shall not be required within sight of equipment and shall be permitted to be located remotely from equipment. The engineered design required by 691.6 shall document disconnection procedures and means of isolating equipment.

Informational Note: See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, for information on electrical system maintenance. See NFPA 70E-2021, *Standard for Electrical Safety in the Workplace*, for information on written procedures and conditions of maintenance, including lockout/tagout procedures.

Buildings whose sole purpose is to house and protect supply station equipment shall not be required to comply with 690.12. Written standard operating procedures shall be available at the site detailing necessary shutdown procedures in the event of an emergency.