600 kWh photovoltaic energy storage system

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Introduction. There have been changes throughout the entire 2023 NEC that may affect the installation of photovoltaic (PV) systems. However, this article will concentrate on the changes in Article 690, Solar Photovoltaic (PV) Systems, Article 705, Interconnected Power Production Sources, Article 691, Large-Scale Photovoltaic (PV) Electric Supply Stations, and Article 710, Stand-Alone Systems, that more directly affect PV systems. These articles are under the purview of Code-Making Panel No. 4, chaired by James J. Rogers.

Unfortunately, the definition of Stationary Standby Batteries as batteries remaining in a float charge or near 100 percent state of charge awaiting a discharge event also appears to be applicable to energy storage system batteries. Most PV systems with energy storage systems are utility-interactive, and the batteries remain in the fully charged state until there is a utility outage, sometimes at infrequent intervals or never. The two articles may overlap and be applied in a single system. Here is an example.

The text of the 2023 NEC changes will not be fully addressed because of the limitations on the length of this article. The full text of the 2023 NEC is available for viewing on the NFPA website at NFPA

Section 690.1, Scope. Informational Notes, Figures 690.1(a) and (b) have been combined into one figure Informational Note, Figure 690.1. This revision adds some clarity by eliminating the interconnections to energy storage systems and showing only the DC PV circuits.

Section 690.4(B), General Requirements. Additional equipment and acronyms have been added to the list of equipment that must be listed or have a field inspection label applied.

Section 690.4(G), PV Equipment Floating on Bodies of Water. This new section dealing with equipment floating on bodies of water has been added. The section adds additional requirements over those requirements for fixed, land-based PV installations.

Section 690.7(D), Marking DC PV Circuits, has been added dealing with the marking requirements for DC PV circuits. The highest maximum DC voltage in the system must be provided by the installer in one of three listed locations.

Section 690.8(1)(b), Photovoltaic Output Circuit Currents, has been eliminated and the subsequent paragraphs renumbered with some combining of requirements. An Informational Note has been added to indicate that modules that can produce electricity when exposed to light on multiple surfaces are labeled with additional information.

Section 690.8(D), Sizing of Module Interconnection Conductors, has had the name changed to Multiple PV

String Circuits and has been divided into subparagraphs for additional clarity.

Section 690.9(D), Power Transformers, has had the name changed to Transformers and the current text has been shortened and points to the requirement in Section 705.30 (F). The Exception remains the same.

In Section 690.12, Rapid Shutdown of PV Systems on Buildings, Exception Number 2 has been added dealing with non-enclosed detached structures not requiring rapid shutdown systems.

Section 690.12(A), Controlled Conductors, has a new Exception dealing with arrays not attached to buildings that terminate on the exterior buildings and PV system circuits installed in accordance with 230.6. These circuits are excepted from the rapid shutdown requirement.

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