ARTICLE
706 Energy Storage Systems

Part I. General

Δ **706.1 Scope.** This article applies to all energy storage systems (ESS) having a capacity greater than 3.6 MJ (1 kWh) that may be stand-alone or interactive with other electric power production sources. These systems are primarily intended to store and provide energy during normal operating conditions.

Energy storage systems (ESS) store energy for later use. Wind power and photovoltaic (PV) systems generate power when the resource is available, not necessarily when the energy is needed. Energy storage optimizes the use of stand-alone alternative energy by storing energy during peak production times so that the energy can be used at a time when wind or sunlight is not available. Increasingly, energy storage is being used to take advantage of utility generating capacity during overnight hours when demand for energy is low and the time-of-use energy rates are customer friendly. Storing energy might reduce the need to build additional generating stations. Energy storage can be installed at the generating facility, or it can be geographically distributed throughout the service area.

The overall scope of Article 706 covers the complete assembly for storing and exporting electrical energy. In accordance with 706.5, this assembly of components is required to be listed as an ESS. UL 9540, *Energy Storage Systems and Equipment*, contains product safety requirements for electrochemical, chemical, mechanical, and thermal ESS. A battery-based ESS certified in accordance with UL 9540 is subject to the installation requirements of Article 706, rather than with Article 480. A group of separate components that includes storage batteries; that is provided with support systems (racks), charge controller(s), and inverters; and that does not have an overall listing as an ESS is a storage battery system and as such is subject to the requirements of Article 480.

Informational Note No. 1: See Article 480 for installations that meet the definition of *stationary standby batteries*.

Informational Note No. 2: For batteries rated in ampere hours, kWh is equal to the nominal rated voltage times ampere-hour rating divided by 1000.

Informational Note No. 3: The following standards are frequently referenced for the installation of ESSs:

(1) NFPA 1-2021, *Fire Code*
(2) NFPA 111-2019, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*
(3) NECA 416-2016, *Recommended Practice for Installing Energy Storage Systems (ESS)*
(4) UL 810A, *Electrochemical Capacitors*
(5) NFPA 855-2020, *Standard for the Installation of Stationary Energy Storage Systems*
(6) UL 1973, *Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power, and Light Electric Rail (LER) Applications*
(7) UL 1989, *Standard for Standby Batteries*
(8) UL 9540, *Standard for Safety Energy Storage Systems and Equipment*
(9) UL Subject 2436, *Spill Containment For Stationary Lead Acid Battery Systems*

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706.3 Qualified Personnel. The installation and maintenance of ESS equipment and all associated wiring and interconnections shall be performed only by qualified persons.

Informational Note: See Article 100 for the definition of *qualified person*.

706.4 System Requirements. Each ESS shall be provided with a nameplate plainly visible after installation and marked with the following:

(1) Manufacturer's name, trademark, or other descriptive marking by which the organization responsible for supplying the ESS can be identified
(2) Rated frequency
(3) Number of phases, if ac
(4) Rating (kW or kVA)
(5) Available fault current derived by the ESS at the output terminals
(6) Maximum output and input current of the ESS at the output terminals
(7) Maximum output and input voltage of the ESS at the output terminals
(8) Utility-interactive capability, if applicable

706.5 Listing. Energy storage systems shall be listed.

706.6 Multiple Systems. Multiple ESSs shall be permitted to be installed on the same premises.

Δ **706.7 Commissioning and Maintenance.**

N **(A) Commissioning.** ESSs shall be commissioned upon installation. This shall not apply in one- and two-family dwellings.

Informational Note: See NFPA 855-2020, *Standard for the Installation of Stationary Energy Storage Systems*, for information related to the commissioning of ESSs.

N **(B) Maintenance.** ESSs shall be maintained in proper and safe operating condition. The required maintenance shall be in accordance with the manufacturer's requirements and industry standards. A written record of the system maintenance shall be kept and shall include records of repairs and replacements necessary to maintain the system in proper and safe operating condition. This shall not apply in one- and two-family dwellings.

Informational Note: See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, or ANSI/NETA ATS-2017, *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems*, for information related to general electrical equipment maintenance and developing an effective electrical preventive maintenance (EPM) program.