

Proposal Number: 2018-OA-015

Rule 64-000 and 64-900s - New

Description of Change: Include energy storage systems in Section 64

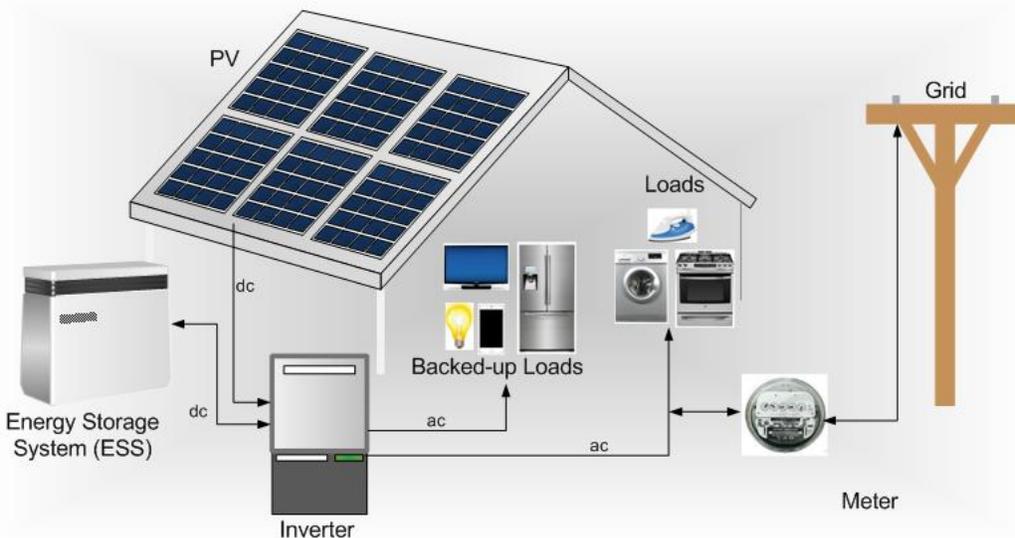
Proposed by: Electrical Safety Authority

Background:

Energy storage systems (ESSs) are mechanisms capable of storing energy for use at a future time.

These mechanisms could be electrochemical (batteries, which are typical for residential solar PV installations), chemical (hydrogen fuel), mechanical (flywheel systems or compressed air) and thermal. For homes and commercial facilities, ESSs provide the benefit of having electricity available onsite to help reduce peak utility demand and/or usage when generation is unavailable. With ongoing grid modernization incorporating increased levels of distributed generation and renewable energy sources, defined rules and requirements are needed to ensure installation of safe home energy storage.

A basic layout of a grid-tied solar PV system with a self-contained energy storage system (ESS) is below.



Rationale:

CE code, C22.1-18 does not include reference for ESS and any requirements for installation of energy storage systems. The National Electrical Code, NEC 2017, is updated to include the new Article 706 Energy Storage Systems.

A proposal has been issued to Section 64 of CE Code to include energy storage systems in the next edition C22.1-21.

ESSs can store very large amounts of energy, posing a potential fire or shock hazard when handled incorrectly. It is, therefore, crucial these systems be evaluated, tested (self-contained) and installed to ensure safe operation. Self-contained energy storage equipment is required to be approved in accordance with the standard ANSI/CAN/UL 9540-16 “Energy storage systems and equipment.”

But, it is important to specify rules for installation of both self-contained and other energy storage systems.

Similar to the National Electrical Code requirements the proposal is issued for facilities with ESS to be identified with “a permanent plaque or directory installed on the exterior of the building or structure at a readily visible location acceptable to the authority having jurisdiction.”

Proposed Change:

Amend Section 64 Title, Rule 64-000 and add series of Rules 64-900 as follows

Section 64 — Renewable energy and energy storage systems

64-000 Scope (see Appendix B)

- (1) This Section applies to the installation of renewable energy and energy storage systems except where the voltage and current are limited in accordance with Rule 16-200(1)(a) and (b).
- (2) This Section supplements or amends the general requirements of this Code.

64-002 Special terminology (see Appendix B)

In this Section, the following definitions apply:

Energy storage systems (ESS) — Equipment or systems that receive electrical energy and then provides a means to store that energy in some form for later use in order to supply electrical energy when needed.

Energy storage systems, Self-contained - Energy storage systems where the components such as cells, batteries, or modules and any necessary controls, ventilation, illumination, fire suppression, or alarm systems are assembled, installed, and packaged into a singular energy storage container or unit. They are required to be approved to the standard ANSI/CAN/UL 9540.

Energy storage systems, Other - Energy storage systems that are not self-contained but instead are composed of individual devices assembled as a system.

Energy storage systems

64-900 General

Rules 64-050 to 64-078 apply to energy storage systems a, except where otherwise specified.

64-902 Interactive point of connection

The output of **interactive** energy storage system is permitted to be connected in accordance with Rule 64-112.

64-904 Voltage of energy storage systems

Energy storage systems with maximum voltages higher than 750 Volts dc but not exceeding 1500 Volts dc shall not be required to comply with Rules 36-204, 36-208 and 36 214 provided that

- a) the installation is serviced only by qualified persons;
- b) the part of the installation exceeding 750 V dc is inaccessible to the public; and
- c) enclosures in which photovoltaic source and output circuits exceeding 750 V dc are present are marked with the word “DANGER” followed by the maximum rated photovoltaic circuit voltage of the equipment.

64-906 Facilities with ESS

- (1) Any structure or building with an ESS shall have a permanent plaque or directory installed on the exterior of the building or structure at a location acceptable to the Authority.
- (2) The plaque or directory required by subrule (1) shall indicate the location of system disconnecting means and that the structure contains ESS.

Add new Appendix B note

64-002

Energy storage systems can include but is not limited to batteries, capacitors, and kinetic energy devices (e.g., flywheels and compressed air). These systems can have ac or dc output for utilization and can include inverters and converters to change stored energy into electrical energy.

Uninterruptible Power Systems (UPS) certified to CSA C22.2 107.3 are not ESSs.

64-900

General requirements specified in Section 64, such as requirements for disconnecting means and overcurrent protection, are applicable to ESSs.