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TECHNICAL SPECIFICATION

colour inside

Electrical energy storage (EES) systems – Part 3-3: Planning and performance assessment of electrical energy storage systems – Additional requirements for energy intensive and backup power applications



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL ENERGY STORAGE (EES) SYSTEMS –

Part 3-3: Planning and performance assessment of electrical energy storage systems – Additional requirements for energy intensive and backup power applications

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IEC TS 62933-3-3 has been prepared by IEC technical committee 120: Electrical Energy Storage (EES) Systems. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
120/262/DTS	120/275/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62933 series, published under the general title *Electrical energy storage (EES) systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

Electrical energy storage (EES) systems can provide solutions to multiple energy storage scenarios. The objective of this document is to provide requirements, guidelines and references when EES systems are designed, controlled and operated for energy intensive, islanded grid and backup power supply applications.

ELECTRICAL ENERGY STORAGE (EES) SYSTEMS –

Part 3-3: Planning and performance assessment of electrical energy storage systems – Additional requirements for energy intensive and backup power applications

1 Scope

This part of IEC 62933 provides requirements, guidelines and references when EES systems are designed, controlled and operated for energy intensive, islanded grid and backup power supply applications. In energy intensive applications, the EES system provides long charge and discharge phases at variable powers to the supported grid or user equipment. In islanded operation, the EES system provides energy to the islanded grid and coordinates other power generation systems in the islanded grid. In backup power supply and emergency support, the EES system provides energy to the internal grid or a set of emergency loads when the main grid power supply is not available.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61850-7-420, *Communication networks and systems for power utility automation – Part 7–420: Basic communication structure – Distributed energy resources and distribution automation logical nodes*

IEC TR 61850-90-9, *Communication networks and systems for power utility automation – Part 90-9: Use of IEC 61850 for Electrical Energy Storage Systems*

IEC 62933-1:2018, *Electrical energy storage (EES) systems – Part 1: Vocabulary*

IEC 62933-2-1, *Electrical energy storage (EES) systems – Part 2-1: Unit parameters and testing methods – General specification*

IEC TS 62933-2-2, *Electrical energy storage (EES) systems – Part 2-2: Unit parameters and testing methods – Application and performance testing*

IEC TS 62933-3-1:2018, *Electrical energy storage (EES) systems – Part 3-1: Planning and performance assessment of electrical energy storage systems – General specification*

IEC TS 62933-3-2:2022, *Electrical energy storage (EES) systems – Part 3-2: Planning and performance assessment of electrical energy storage systems – Additional requirements for power intensive and renewable energy sources integration related applications*

3 Terms, definitions, abbreviated terms and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62933-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/;
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
backup power supply
provision of power to all internal loads connected to user side equipment during a specified time period without relying on an external power source in the event of electrical grid outage

3.1.2
black start capability
capability of the EES system to start the electric power system (IEV 601-01-01) only with internal energy resources

3.1.3
allowed charging time
time period when an EES system is allowed to charge the accumulation subsystem in the peak shaving application

3.1.4
allowed discharging time
time period when an EES system is allowed to discharge the accumulation subsystem in the peak shaving application

3.1.5
duty cycle roundtrip efficiency
energy discharged measured at the primary POC divided by the energy absorbed by the EES system, as a sum of what is measured at all the POCs (primary and auxiliary), during duty cycles in a specified operating mode at continuous operating conditions with the same final state of charge as the initial state of charge

[SOURCE: IEC 62933-1:2018, 4.12.1, modified – the notes have been deleted.]

3.1.6
emergency load
set of devices and equipment that should be operated during electrical grid outage

3.1.7
emergency support
provision of power to emergency loads within a specified time and duration without relying on an external power source in the event of electrical grid outage

3.1.8
energy intensive application
EES system application generally not very demanding in terms of step response performances but with long charge and discharge phases at variable powers

[SOURCE: IEC 62933-1:2018, 3.12, modified – the terms “long duration application” and “long term application” have been deleted and the notes have been deleted.]

3.1.9
fluctuation reduction of consumption
reduction of power oscillation of power consumption at the grid connection point by absorbing the active power of the grid by EES systems at low power demand phases and by feeding in additional active power by EES systems at high power demand phases