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IEEE Standard Test Procedures for Electric Energy Storage Equipment and Systems for Electric Power Systems Applications

Sponsored by the
IEEE Standards Coordinating Committee 21 on Fuel Cells, Photovoltaics, Dispersed Generation, and Energy Storage

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IEEE Standard Test Procedures for Electric Energy Storage Equipment and Systems for Electric Power Systems Applications

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IEEE Standards Coordinating Committee 21 on Fuel Cells, Photovoltaics, Dispersed Generation, and Energy Storage

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Abstract: Applications of electric energy storage equipment and systems (ESS) for electric power systems (EPSs) are covered. Testing items and procedures, including type test, production test, installation evaluation, commissioning test at site, and periodic test, are provided in order to verify whether ESS applied in EPSs meet the safety and reliability requirements of the EPS. Grid operators, ESS manufactures, and ESS operators are for whom this standard is established.

Keywords: commissioning test, electric energy storage equipment, electric energy storage systems, electric power systems, IEEE 2030.3™, installation evaluation, periodic test, production test, test procedure, type test

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Introduction

This introduction is not part of IEEE Std 2030.3–2016, IEEE Standard Test Procedures for Electric Energy Storage Equipment and Systems for Electric Power Systems Applications.

Energy storage equipment and systems (ESS) that connect to an electric power system (EPS) shall meet the requirements specified in related IEEE standards. Standardized test procedures are necessary to establish and verify compliance with those requirements. These test procedures need to provide both repeatable results, at independent test locations, and have flexibility to accommodate the variety of storage technologies and applications.

This guide is comprised of 10 clauses and two annexes. The main content includes type tests, production tests, installation evaluations, commissioning tests at site, and periodic tests.

Despite the fact that ESS applied in an EPS are at discharging state (acting as power sources) or at charging state (acting as load), ESS shall comply with the planning and operation requirements of the grid. This standard aims to provide the test items and procedures for the ESS applied in EPSs to verify whether the relevant characteristic parameters of the integrated ESS are in accordance with the technical requirements of the EPSs.

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IEEE Standard Test Procedures for Electric Energy Storage Equipment and Systems for Electric Power Systems Applications

Overview

1.1 Scope

The test items and procedures of electric energy storage equipment and systems (ESS) for electric power system (EPS) applications, including type test, production test, installation evaluation, commissioning test at site, and periodic tests are as follows:

- Type tests covering all necessary test items of ESS applied in EPSs
- Production tests, including quality inspection and test of ESS before shipment
- Installation evaluation shall be carried out after field installation of ESS
- Commissioning tests shall be carried out on site when the field installation of ESS are complete and before they are officially put into operation
- Periodic tests shall be periodically carried out after ESS are officially applied in the EPS.

ESS can either be a single piece of equipment with all functions or an integrated set of equipment with specific functions. A single piece of equipment shall go through type tests, production tests, installation evaluation, and commissioning tests as a whole. Each piece of an integrated set of equipment shall go through type tests and