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GB/T 42316-2023

Technical specification for centralized monitoring and control system of distributed energy storage

分布式储能集中监控系统技术规范

Issued on: March 17, 2023 **Implemented on: October 1, 2023**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 October 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 42316-2023 covers the system through which an operator watches and controls many small energy storage installations from one place, rather than visiting or dialling into each of them separately. The overall requirements state the application functions such a system carries: data collection, real-time communication, operation monitoring and operation control. Its structure is then fixed in three layers - a front-end convergence layer that gathers from the sites, a business processing layer above it, and a resource storage layer - followed by the normal operating conditions the system is expected to work in, the functional requirements that take up most of the document, the performance requirements including system availability, and the test and inspection by which a delivered system is accepted. Distributed storage is awkward exactly because it is scattered: the units sit behind different meters, at different customers, on communication links of differing quality, and their combined output only becomes a usable resource if the monitoring layer sees them consistently and can act on them within a known time. A platform that reports late, or drops sites without saying so, turns a fleet back into a set of unrelated batteries. Terms follow DL/T 2528. Grid and aggregator operating companies, storage integrators and platform

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suppliers are the users.

This document specifies the system structure, normal operating conditions, functional requirements, performance requirements, test and inspection of the centralized monitoring and control system of distributed energy storage.

This document is applicable to the design, manufacturing, testing, operation, maintenance and overhaul of the centralized monitoring and control system of distributed energy storage.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 13729 Remote Terminal Unit Equipment

GB/T 36572 Guidelines of Cyber Security Protection for Electric Power System Supervision and Control

GB 50229 Code for Design of Fire Protection for Fossil Fuel Power Plants and Substations

DL/T 634.5101 Telecontrol Equipment and Systems - Part 5-101: Transmission Protocols - Companion Standard for Basic Telecontrol Tasks

DL/T 634.5104 Telecontrol Equipment and Systems - Part 5-104: Transmission Protocols - Network Access for IEC 60870-5-101 Using Standard Transport Profiles

DL/T 860 (all parts) Communication Networks and Systems for Power Utility Automation

DL/T 2528 Basic Terminology of Electrical Energy Storage

DL/T 5149 Code for Design of Substation Monitoring and Control System

3 Terms and Definitions

What is defined in DL/T 2528, and the following terms and definitions are applicable to this

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document.

3.1 centralized monitoring and control system of distributed energy storage

A system that performs centralized and real-time monitoring and control of one or above distributed energy storage based on the application of computers, networks and communication technologies.

4 Overall Requirements

4.1 The centralized monitoring and control system of distributed energy storage shall be equipped with the application functions of data collection, real-time communication, operation monitoring and operation control, etc.

4.2 The centralized monitoring and control system of distributed energy storage shall adopt a hierarchical, classified and open system structure, and have scalability.

4.3 The centralized monitoring and control system of distributed energy storage shall have redundancy configuration in key equipment and links, such as: servers, switches and communication channels, etc.

4.4 The centralized monitoring and control system of distributed energy storage under the dispatching command management by the power grid shall have the capability of exchanging real-time information with the power grid dispatching system, and its security protection shall satisfy the requirements of GB/T 36572.

5 System Structure

5.1 The centralized monitoring and control system of distributed energy storage consists of the front-end convergence layer, the business processing layer and the resource storage layer. A typical structure is shown in Appendix A. The functions of each layer are as follows:

a) The front-end convergence layer, which realizes the prepositive communication

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function, includes prepositive servers and security gateway servers;

b) The business processing layer, which realizes application functions, such as:

operation monitoring and operation control, includes application servers and

workstations;

c) The resource storage layer, which realizes data storage function, includes database

servers.

5.2 The centralized monitoring and control system of distributed energy storage shall support

wired and wireless access. Those under wired transmission and configured with longitudinal

encryption devices shall be connected to the security zone I; those under wired public network,

wireless private network or wireless public network shall be connected to the security zone IV,

and a security access gateway should be set up.

storage system. For the content of information collection, see Appendix B.

7.1.2 The centralized monitoring and control system of distributed energy storage shall support

various types of communication protocols and the reception of multiple data types.

7.2 Alarm

7.2.1 The centralized monitoring and control system of distributed energy storage shall realize

hierarchical processing of alarm information in accordance with alarm levels, such as: accidents,

abnormalities, threshold-crossing, displacements and notifications, etc.

7.2.2 The centralized monitoring and control system of distributed energy storage shall be

equipped with the function of real-time alarm display. The display content should include level,

time, equipment, behavior and reasons.

7.2.3 The centralized monitoring and control system of distributed energy storage shall be

equipped with the function of retrieving alarm signals based on conditions.

7.3 Operation Monitoring

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