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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Specification of grid connection management for user-side
electrochemical energy storage system**

用户侧电化学储能系统并网管理规范

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1 Scope and defined term

The document fixes the requirements for project filing, for the grid connection application and the review of the connection scheme, for grid connection acceptance and for operation management of user-side electrochemical energy storage systems.

It applies to the construction, connection, testing, inspection and operation of new, rebuilt and extended electrochemical energy storage systems connected to the internal grid of an electricity user. The terms and definitions of DL/T 2528 apply together with one defined here: a user-side electrochemical energy storage system is an electrochemical energy storage system built on the premises of a user or nearby and connected to the internal grid of that user. A note adds that it generally comprises electrochemical storage units, primary and secondary electrical equipment, a monitoring system and the related auxiliary facilities.

4 Basic provisions

Before it is connected, a user-side electrochemical energy storage system goes through project filing, grid connection application, review of the connection scheme and grid connection acceptance.

Its main equipment, that is the battery, the battery management system, the storage converter and the monitoring system, conforms to GB/T 36558; its lightning protection and earthing conform to GB 14050 and GB/T 50065; and its electric energy metering conforms

to DL/T 448 and DL/T 645. Its grid connection performance conforms to GB/T 43526.

A supply and use contract is signed for the connection, and a system that is dispatched by the grid also signs a grid connection dispatching agreement before connection. A dispatched system accepts quality supervision by the electric power quality supervision body according to the requirements of the local administrative department.

5 Project filing

Before connection the filed content is rechecked, and where the project changes materially the filed information is amended promptly.

The filed content covers at least the basic particulars of the project organisation, the basic particulars of the project, the investment in the project and the declaration that the project conforms to industrial policy. The basic particulars of the project preferably include the project name, the site, the purpose and scale of the construction, the storage type and the main functions.

6 Grid connection application and review of the connection scheme

When applying for connection the system supplies the grid enterprise with the documents listed in A.1 of Annex A.

The grid enterprise prepares the connection scheme from the main functions of the system, its charge and discharge power and the capacity of the transformer, the line and the switch it connects to. The scheme covers the project outline and the primary and secondary connection arrangements. Where one user has a system connected at several points, the connection scheme is prepared for the point of connection at the highest voltage level.

The works are designed on the basis of the connection scheme. The design covers the main functions, the operating mode, the primary connection, the equipment list, the grid-related protection, the electric energy metering, the lightning protection and earthing, the fire protection arrangement and the requirements for signs and marks. Where the system is connected to the power load management system, the design also covers the connection of the load management terminal; where the system is dispatched by the grid, it also covers the communication system, the monitoring system and the dispatching automation terminal.

The design of the grid connection works is reviewed, the documents for the review being those listed in A.2. Where the connection scheme changes, the design is reviewed again. Construction of the works follows the connection scheme and the approved design.

7 Grid connection acceptance

Before submitting an application for grid connection acceptance to the grid enterprise, the

system completes the acceptance of the works, and any problem found during grid connection acceptance is rectified.

Grid connection acceptance covers an on-site inspection of the grid-related equipment and systems, among them the storage converter, the substation or distribution equipment and the protection devices, together with an audit of the technical review documents listed in Annex B.

A system connected to the power load management system completes a test of the load management function, and a system dispatched by the grid completes a joint commissioning test with the dispatching automation system. Where the parameters of main grid-related equipment such as the storage converter change appreciably, grid connection acceptance is carried out again.

8 Operation management

The system monitors in real time its own operating state, its abnormal alarms and the operation of its fault protection.

A system dispatched by the grid gives priority to dispatching instructions in starting and stopping, in connecting to and disconnecting from the grid and in controlling its charge and discharge power. Where the grid suffers an accident or an emergency, the system adjusts its charge and discharge power or starts and stops as the grid requires.

A system dispatched by the grid reports its maintenance and outage plan to the grid enterprise as the grid connection dispatching agreement requires.

A Annexes A and B (informative) Documents required

Annex A lists the documents for the grid connection application: the filing or code assignment information form of the local energy authority for an enterprise investment project, or the approval or explanatory document by which the government investment authority agrees to preliminary work on the project; valid proof of identity of the legal person or natural person, with a power of attorney and valid proof of identity of the agent where another person acts; and, for an energy performance contracting project, the energy performance contracting co-operation agreement signed between the project owner and the user, including the agreement on the use or lease of the buildings and facilities.

Annex A also lists the documents for the design review of the grid connection works: proof of the qualification of the design organisation; the design report, drawings and explanatory notes; and the list of main electrical equipment, the primary and secondary wiring diagrams of the electrical installation and the layout drawing.

Annex B lists the technical review documents for a system connected at 10 kV and above: proof of the qualification of the design organisation; the connection works design report,

drawings and explanatory notes; the design documents for concealed works, the relay protection arrangement and the metering arrangement; the list of main electrical equipment, the primary and secondary wiring diagrams and the layout drawing; proof of the qualification of the construction organisation, that is the licence for installation, maintenance and testing of electric power facilities, the construction enterprise qualification certificate and the work safety licence; the as-built drawings, the electrical test report and the record of protection setting and commissioning; the technical parameters, type test reports and instructions of the main equipment, covering the battery, the battery management system, the storage converter, the monitoring system, the transformer, the circuit breaker and the isolating switch; the records of the electrical tests, protection setting, joint communication commissioning and energy information collection carried out before connection, together with the commissioning reports of the main equipment; a power quality assessment report issued before connection by an organisation qualified for such testing; and the on-site operating rules of the user-side storage system with the list of operating staff and proof of their qualifications.

For a system connected at 380 V or 220 V, Annex B lists a shorter set: proof of the qualification of the construction organisation, that is the licence for installation, maintenance and testing of electric power facilities and the work safety licence; the as-built drawings, the electrical test report and the record of protection setting and commissioning; the technical parameters, type test reports and instructions of the main equipment, covering the battery, the battery management system, the storage converter, the monitoring system, the circuit breaker and the isolating switch; and the records of the electrical tests, protection setting, joint communication commissioning and energy information collection carried out before connection.