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

GB/T 44134-2024

**Planning guide for electrochemical energy storage station in
power system**

电力系统配置电化学储能电站规划导则

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Foreword

This document was issued on 28 May 2024 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 December 2024.

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 44134-2024 is the planning guide for siting and sizing electrochemical energy storage stations on the Chinese power system. China is building grid batteries faster than anyone, largely because provinces require new renewable capacity to be paired with storage, and the question the guide answers is the one those mandates skip: how much storage, of what duration, at which point on the system actually helps. The answer differs by connection point, which is how the standard is organised. It sets the general requirements and the analysis of system requirements, then the configuration principles and methods for storage on the generation side, on the grid side and on the user side, each with the services expected of it and the sizing that follows. It took effect on 1 December 2024.

This document specifies the system requirements analysis for electrochemical energy storage station in power system, as well as the configuration principles and methods of electrochemical energy storage station on the power supply side, grid side, and user side.

This document applies to the planning and configuration of the electrochemical energy storage station connected to power system at a voltage level of 10 (6) kV and above.

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 version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB 38755, Code on security and stability for power system

DL/T 2528, Basic terminology of electrical energy storage

3 Terms and definitions

For the purposes of this document, the terms and definitions given in DL/T 2528 and the following apply.

3.1

electrochemical energy storage station

Energy storage station whose energy storage uses electrochemical energy storage media, which mainly include: lithium-ion battery, lead-acid/lead-carbon battery, flow battery, sodium-ion battery, sodium-sulfur battery, fuel cell, etc. Electrochemical energy storage station is divided into three categories: power supply side, grid side, and user side according to its access point location.

3.2

peak shaving

regulation resources, and demand-side response capabilities, and be determined in combination with factors such as the construction conditions and construction period of the energy storage project.

4.5 When the planning and implementation of the electrochemical energy storage station differs significantly from expectations or there are major adjustments to the energy and power plan, planning assessment and rolling adjustments shall be conducted.

5 System requirements analysis

5.1 General requirements

5.1.1 The requirements analysis of electrochemical energy storage station in power system shall be determined based on the system's peak shaving, frequency regulation, black-start and other needs, and should be carried out in combination with the layering and zoning of the grid structure.

5.1.2 The calculation level year of requirements analysis shall be consistent with the planning level year, and divided into short-term, medium-term and long-term. Short-term requirements analysis shall list the analysis results year by year.

5.1.3 The requirements analysis for electrochemical energy storage station in power system shall be carried out based on the current status of the power system and the system power, electricity, and regulation balance results, and in combination with the planning level year power supply planning, grid planning, existing and planned new and retired flexible regulation resources, etc.

5.1.4 The requirements analysis for electrochemical energy storage station in power system shall meet the relevant requirements of GB 38755.

5.2 Basic data collection

5.2.1 The requirements analysis for electrochemical energy storage station in power system shall collect the current status and planning data of the area.

5.2.2 The current status data shall include data on power grid, power source, load, electrochemical energy storage station and other types of energy storage, and shall meet the following requirements:

- a) Grid data includes grid structure, power flow distribution, as well as equipment parameters such as lines, transformers, and reactive power compensation devices;
- b) Power supply data includes power supply type, power supply structure, installed capacity, layout, output characteristics, peak shaving and frequency regulation characteristics, black-start capability, power generation, annual utilization hours,

maintenance and downtime, etc.;

c) Load data includes load type, maximum load, minimum load, load characteristics, power consumption, average annual growth rate, etc.;

d) Electrochemical energy storage station data includes energy storage battery type, rated charging power, rated discharging power, rated charging energy, rated discharging energy, regulation performance, grid connection point, technical and economic parameters, etc.;

e) Other types of energy storage data include technology type, installed capacity, regulation performance, grid connection point, technical and economic parameters, etc.

5.2.3 Planning data shall include load forecast data, power supply planning schemes, grid planning schemes, energy storage projects under construction and included in the plan, etc.

5.3 System peak-shaving energy storage requirements analysis

5.3.1 The system peak-shaving energy storage requirements shall be determined based on the analysis of the power, electricity and peak-shaving balance in each planning level year, and should be determined in the following way:

- a) Calculate the system peak shaving requirements based on the output characteristics of power sources (including pumped storage power stations), the transmission curve of interconnected system tie lines and load characteristics, deduct the existing and planned new and retired system peak shaving capacity, and determine the power demand of the electrochemical energy storage station;
- b) Calculate the system deficit and surplus balance electricity in typical modes for each level year on an annual, quarterly and monthly basis to determine the energy requirements of the electrochemical energy storage station.

5.3.2 The system peak-shaving energy storage requirements analysis shall be calculated using the production operation simulation method to determine the power and energy configuration scale of the electrochemical energy storage station.