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**Operation and maintenance procedures for power storage
system of pumped storage power station**

抽水蓄能电站厂用电系统运行检修规程 清晰版

(English Translation)

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Foreword

The format and rules of this standard complies with GB/T 1.1-2009 "Guidelines for Standardization Part 1: Standard Structure and Writing" Claim.

Please note that certain contents of this standard may involve patents. The issuing organization of this standard does not bear the responsibility for identifying these patents.

This standard was proposed and managed by the China Electricity Council.

1 Scope

This standard specifies the requirements for the operation, maintenance and overhaul of the auxiliary power system of pumped storage power stations.

This standard applies to pumped storage power stations.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 32574 Guidelines for overhaul of pumped storage power stations DL/T 596 Preventive

test procedures for electrical equipment DL/T 664 Application Specification for Infrared
Diagnosis of Live Equipment DL/T 1102 Operating Regulations for Distribution
Transformers DL/T 1253 Power cable line operation regulations

3 Terms and definitions

Plant power system

Maintain the power system for the equipment and lighting produced by the pumped storage power station. Including 35kV and below factory transformers, high voltage switch cabinets, electric Reactor, load switch, low voltage switch cabinet, voltage transformer, current transformer, low voltage switchboard, arrester cabinet, diesel generator, pouring

Note busbars, dense busbars, cables, overhead lines, automatic switching devices, etc.

Diesel generator test for black start Diesel generators are used to simulate the condition of power outage in the whole station, and provide the governor, ball valve and technical water supply required for the unit to start power generation Wait for the test of auxiliary system AC power load.

4 Basic requirements

4.1

The auxiliary power system shall adopt the segmented operation mode. When the operation mode is changed, it shall meet the requirements of the accident plan.

4.2

According to the design requirements and operating environment, the plant power system should be inspected, regularly switched, routine maintenance, live detection, overhaul, Preventive testing and other work.

4.3

The anti-misoperation locking device of the auxiliary power system should be in good condition.

4.4

The live warning signs on the cabinet doors of the plant power system equipment should be intact, and the exposed live parts should be reliably covered.

4.5

Check the operation mode of the system before operation, and confirm that the operated equipment and operation steps are correct.

4.6

The standby auto-switching device of busbars at all levels should be put in normally, and the standby power automatic switching test should be carried out regularly.

4.7

Diesel generators should be started regularly and a load switching test should be carried out.

4.8

The pumped storage power station shall prepare emergency response plans for the auxiliary power system according to actual conditions.

4.9

Pumped-storage power stations should prepare technical document management requirements for plant power system equipment, and use the information management system to carry out the entire process of equipment management.

Rationale.

5.1 General requirements

5.1.1

The voltage deviation of the bus at all levels of the plant service power should not exceed $\pm 5\%$ of the rated voltage. When only the motor is connected, it may not exceed 10% and -5%. When the generator is running in phase, the auxiliary power voltage should be monitored within the normal range.

5.1.2

The relay protection device of plant power equipment should be set according to the fixed value list and checked regularly.

5.1.3

Changing the operation mode of auxiliary power supply should be carried out when the whole plant's units are shut down.

5.2.1 Normal operation mode

5.2.1.1

The normal operation mode of the auxiliary power system shall meet the following conditions.

- a) The working power supply is normally turned on;
- b) The regional power supply is running or hot standby;

- c) Diesel generators and other safety power supplies can be started remotely when they are in cold standby state;
- d) The automatic switching function of standby power at all levels of the auxiliary power system is normal;
- e) The relay protection function is normal.

5.2.2 Abnormal operation mode

5.2.2.1

The plant power system does not meet the conditions of the normal operation mode and is an abnormal operation mode.

5.2.2.2

When the plant power system is in the following abnormal operation modes, the monitoring and inspection shall be strengthened.

- a) The operating mode where part of the working power supply is lost and the remaining working power supply or backup power supply is used;
- b) Operation mode in which all working power is lost and power is supplied by the backup power;
- c) The operation mode in which all working power and backup power are lost and the power is supplied by the security power supply.

5.3.1 High voltage switch cabinet operation

5.3.1.1

The opening and closing of the circuit breaker in the high-voltage switch cabinet should be operated remotely and inspected on site. Check and confirm before opening and closing operations to prevent errors Open and close the circuit breaker.

5.3.1.2

For the high-voltage switchgear as the isolation point of the overhaul equipment, the handcart should be shaken to the test or overhaul position after disconnecting the circuit breaker, and prevent Locking measures that are accidentally moved into the working position, and the control power supply and closing energy should be disconnected.

5.3.1.3

After the circuit breaker is operated, check that the opening and closing positions of the circuit breaker are correct. Before operating the circuit breaker handcart, confirm that the circuit breaker is in the open position.