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

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**Code of operation and maintenance for online condition
monitoring system of hydro-generator sets**

水轮发电机组状态在线监测系统运行维护与检修试验规程

(English Translation)

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Table of Contents

Foreword

Operation and maintenance procedures of the online monitoring system for the state of hydro-turbine generator sets

1 Scope

2 Normative references

3 Operation and maintenance

4 Maintenance and test

Appendix A (Informative Appendix) Common fault types and treatment methods of online monitoring system

Appendix B (Informative appendix) Periodic maintenance items and contents of the upper computer unit

Appendix C (Informative appendix) Data acquisition unit maintenance items and content

Appendix D (Informative Appendix) Online Monitoring Systematic Test

References

Foreword

This standard is compiled in accordance with the rules given in GB/T 1.1-2009 "Guidelines for Standardization Work Part 1: Standard Structure and Compilation".

This standard was proposed by the China Electricity Council.

This standard is under the jurisdiction of the Electric Power Industry Hydropower Station Automation Standardization Technical Committee.

Drafting organizations of this standard. China Three Gorges Corporation, State Grid Xinyuan Holdings Co., Ltd.

1 Scope

This standard specifies the technical requirements for the operation, maintenance, overhaul, and testing of the online monitoring system for the state of hydro-turbine generator sets.

This standard is applicable to the online monitoring system for the status of hydro-generator sets of large and medium-sized hydropower stations. Small hydropower station hydro-generator set online the monitoring system can be used as reference.

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 file. For undated application documents, the latest version (including all amendments) applies to this document.

GB/T 28570 Technical Guidelines for On-line Monitoring System of Hydrogenerator Unit
State GB/T 50150 Electrical equipment installation engineering electrical equipment
handover test standard DL/T 356 Partial discharge measuring instrument calibration
specification DL/T 619 Hydropower plant automation components (devices) and their
system operation, maintenance and overhaul test procedures DL/T 846.4 General technical
requirements for high voltage test equipment Part 4: Partial discharge measuring
instrument DL/T 862 Hydropower plant automation components (devices) installation and
acceptance regulations DL/T 1197 Technical conditions for online monitoring system of
hydro-generator unit status

3.1.1 General provisions

3.1.1.1

The functions and performance of the online monitoring system shall meet the relevant regulations and requirements of DL/T 1197 and GB/T 28570.

3.1.1.2

During the operation of the online monitoring system, the components (devices) shall be free of leakage, water pollution, oil pollution and rust, and shall be free of abnormal sound and odor.

3.1.1.3

Operation and maintenance personnel shall conduct special training and have the ability to operate and maintain related equipment.

3.1.1.4

A proper amount of spare parts shall be provided.

3.1.2 The data analysis, status report review and alarm confirmation of the online monitoring system should be used to understand the monitored equipment and online Monitor system operation status.

3.1.3 The online monitoring system should be inspected regularly, and the inspection content should include the upper computer unit, data acquisition unit and sensor unit Wait for the working status of the equipment.

3.1.4 The alarm information of the online monitoring system should be confirmed in time, and if necessary, it should be confirmed on the spot or reported to the person in charge of

duty or maintenance in time member.

3.1.5 When the online monitoring system has important alarm signals (such as equipment power failure, data storage failure, system communication failure, etc.), contact in time Maintenance personnel handle it.

3.2.1 General provisions

3.2.1.1

The maintenance content includes daily inspection, regular maintenance and defect handling.

3.2.1.2

The maintenance and technical improvement of the online monitoring system shall set up a special account and record the relevant content in time, involving software repairs.

Software backups should be carried out in advance for changes, upgrades, etc., and software version management should be carried out;

Electricity measures, and accident prevention, if necessary, system backup and data backup; work involving external communications should be approved by the other party Before proceeding.

3.2.1.3

Routine inspections should be carried out once a week; regular maintenance should be carried out once half a year (can be carried out in conjunction with the maintenance of unit equipment); defects found should be Deal with it in a timely manner, and keep track of the defects or failures that do not meet the conditions to ensure that they are in a controllable state and are Eliminate promptly in preparation.

3.2.2.1 Daily inspection

1) The working status of the following hardware equipment should be checked.

- a) Host device;
- b) Human-machine interface equipment;
- c) Network equipment;
- d) Network security equipment.

2) The working status of the following software should be checked.

- a) process;
- b) Data collection and processing;
- c) Alarm function;

- d) Communication function;
 - e) Data backup (if automatic data backup fails, manual backup should be performed).
- 3) The following performance parameters should be checked.
- a) CPU load rate;
 - b) Memory usage;
 - c) Disk space;
 - d) Network usage rate.
- 4) The ambient temperature and humidity should be checked.
- 5) Check the system clock synchronization function.

3.2.2.2 Regular maintenance

- a) Software, database and configuration files should be backed up;
- b) Servers, workstations, optical fiber transmission equipment, network security equipment and cabinets should be cleaned;
- c) Disk space should be organized;
- d) The antivirus library code should be upgraded;
- e) The software version should be upgraded.

3.2.3 Data acquisition unit

3.2.3.1

The daily inspection should check the following.

- a) Device status;
- b) Working power supply;
- c) Human-machine interface;
- d) Data collection status;
- e) Failure alarm;
- f) Data communication status;
- g) Fan status.

3.2.3.2

Regular maintenance should include the following.