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

DL/T 1235-2019

Replacing DL/T 1235-2013

**Guide for measurement and modeling of synchronous
generator prime mover and its regulating system parameters**

同步发电机原动机及其调节系统参数实测与建模导则 清晰版

(English Translation)

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Foreword

This standard starts from the rules given in GB/T 1.1-2009 "Guidelines for Standardization Work Part 1: Standard Structure and Compilation" grass.

This standard is an amendment to DL/T 1235-2013 "Guidelines for Measurement and Modeling of Synchronous Generator Prime Mover and Its Regulation System Parameters" Order.

Compared with the previous edition, the main technical changes of this standard are as follows except for editorial changes.

- Added reference standards. GB/T 9652.1 and GB/T 11805 (see 2);
- Added "The model parameters of the prime mover of the hydroturbine unit should directly perform the actuator command step in the opening mode" (see 4.1.7);
- Added "The gas turbine unit test should be carried out in the speed closed loop mode" (see 4.1.8);
- Added "For steam turbine units of gas-steam combined cycle generating units, if the

regulating system is in normal operation, If the door is fully open, no modeling test is required". (see 4.1.9);

--Added the relevant requirements of "the results of the prime mover and its regulation system modeling should be reviewed and stored" (see 4.10);

--Added "The refresh frequency of the output analog of the hydraulic turbine regulation system should be greater than 50Hz, and the electrical power should be PT, CT the measured signal is calculated. "Related requirements (see 5.2);

- Deleted the buffer link model in the turbine control system;

--Added the model of the main output limiting link (see 9.2.4), and modified the model of the turbine control system (see Figure A.9);

--- Increase the large and small step test requirements for the static test of the steam turbine actuator, "should be carried out above 20% of the valve opening" (See 11.1.1);

--- Added Appendix C, the signals that need to be collected, listing typical steam turbine, water turbine and gas the most basic signal required for measurement modeling.

This standard was proposed by the China Electricity Council.

This standard is under the jurisdiction of the National Grid Operation and Control Standardization Technical Committee (SAC/TC446).

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1 Scope

This standard specifies the prime mover and its regulating system model and parameter implementation of the synchronous generator set for power system stability analysis and calculation.

Measurement and modeling methods.

This standard is applicable to the prime mover, energy supply system and energy supply system of steam turbine generator sets, hydraulic turbine generator sets and gas generator sets.

Adjust the actual measurement and modeling of system parameters, and put forward requirements for relevant departments involved in parameter measurement and modeling. Other types of power generation the unit can be implemented by reference.

2 Normative references

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

GB/T 9652.1 Technical conditions of hydraulic turbine control system GB/T 11805 Automatic components (devices) of hydraulic turbine generator sets and basic technical conditions of their systems GB/T 14100 Gas Turbine Acceptance Test DL/T 496 Hydro-turbine electro-hydraulic control system and device adjustment test guide DL/T 824 Guidelines for Performance Acceptance of Steam Turbine Electro-hydraulic Control System

3 Terms and definitions

The following terms and definitions apply to this standard.

Governing system

A control system that controls the operation of the prime mover.

Actuator

Accept the instructions of the prime mover adjustment system to control the electric-hydraulic system or mechanical-hydraulic system of valves, guide vanes (paddles), etc.

???. Pressure system.

Prime mover and energy supply system prime mover and energy supply system Steam turbines and their boilers, water turbines and their water diversion systems, compressors and gas turbines that provide mechanical torque for generators Set.

Static test

A test conducted on a generator set in a shutdown state.

Load test

A test conducted on a generator set under grid-connected conditions.

Step test

A step change test of the set value of the controlled quantity.

Step value

In the step test, the difference between the final steady-state value of the controlled quantity and the initial value is shown in Figure 1 as ΔU .

PM overshoot

In the step test, the percentage of the ratio of the difference between the maximum value of the controlled quantity and the final steady-state value to the step quantity, as shown in Figure 1.

3.10

Dt delay time

In the step test, the time required from the time the step signal is added to when the controlled quantity changes to 10% of the step quantity is shown in Figure 1.

3.11

Upt rise time

In the step test, the time required from the addition of the step amount to the time the controlled amount changes to 90% of the step amount is shown in Figure 1.

3.12

Pt peak time

In the step test, the time from the time the step quantity is added to the controlled quantity reaches the maximum value is shown in Figure 1.

3.13

St settling time

The shortest time from the start time to the absolute value of the difference between the controlled quantity and the final steady-state value does not exceed 5% of the step quantity, as shown in Figure 1.

3.14