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

GB/T 11805-2019

Replacing GB/T 11805-2008

**General specifications for the automatic control components
and devices and their systems for hydro-turbine generating
sets**

水轮发电机组自动化元件（装置）及其系统基本技术条件

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Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	2
4 Applicable conditions	3
5 Requirements 4 6 sampling	10
7 Test method	11
8 Inspection and acceptance rules	19
20 Appendix A (Normative Appendix) Approximate conversion of internal oil leakage of different oil temperature and oil quality slide valves	22

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 11805-2008 "Hydraulic generating units automation components (devices) and their systems basic technical conditions", and Compared with GB/T 11805-2008, the main technical changes are as follows:

- Added "terms and definitions" (see 3.2, 3.3, 3.11);
- Increased the principle of speed setting for pumped storage reversible units or special cases, and modified the electrical of "secondary overspeed contacts" Fixed value (see 3.6, 3.4 of the.2008 edition);
- Modified the electrical output requirements of components (see 5.1.1.12, 5.1.1.12 of the.2008 edition);
- Increased the frequency measurement resolution requirements of the residual voltage measurement method of the electrical speed signal device (see 5.1.2.7, .2008 edition) 5.1.2.7);
- Increased the level requirements for different measurement positions of temperature measuring resistors (RTD) (see 5.1.2.14, 5.1.2.14 of.2008 edition);
- Revised the relevant requirements for electric valves (see 5.1.2.23, 5.1.2.23 of the.2008 version);
- Revised the relevant requirements of the vibration (swing) monitoring device (see

5.1.2.25,

5.1.2.25 of the 2008 edition);

--- Revised the relevant requirements of the generator air gap monitoring device (see 5.1.2.26,

1 Scope

China's national general specification for the automation components, devices and systems of hydro-turbine generating sets - the sensors, transmitters, relays, switches, valves and controllers through which a hydroelectric unit is started, synchronised, loaded, protected and shut down. A hydro station is the most highly automated form of generation there is: units are started and stopped many times a day to follow load, they are routinely run unattended or from a remote control centre, and the machine has to be able to stop itself safely from full load without anybody present. All of that rests on the components this standard covers. It specifies the general technical conditions for the automatic control components and devices of hydro-turbine generating sets and for the systems built from them. The requirements are those of components whose failure mode matters more than their performance. Accuracy and repeatability are specified, but so is the behaviour on failure: what a transmitter does when it loses its signal, what a relay does when it loses its supply, and whether the failure is one the control system can detect. To those are added the environmental requirements of a machine hall - the humidity and the condensation, the flooding risk at the pit level, the vibration of a large rotating machine, the temperature range, and the electromagnetic environment beside a generator and its excitation. The system clauses cover how the components are combined: the signal interfaces and levels, the redundancy where a function is critical, the independence of the protection paths from the control paths, and the testing and commissioning of the assembled system. The provisions on the emergency shutdown and on the mechanical overspeed protection are the ones the whole station depends on, because a hydro unit that loses load and does not close its gates runs away. Issued on 4 June 2019 and in force since 1 January 2020, it replaces GB/T 11805-2008.

This standard specifies the basic technical requirements for the automation components (devices) used in hydroelectric generating units, water inlet valves and speed control systems. It specifies the system configuration requirements, and specifies the corresponding test methods and acceptance rules, signs, packaging and other content. This standard applies to the manufacture of products for hydropower station automation components (devices) and the automation of hydroelectric generating units that meet one of the following conditions. System configuration and handover acceptance of components (devices).

- a) single unit capacity is 10MW and above;
- b) Impact type units with a nominal diameter of

1.5 m and above;

c) Francis turbines with a nominal diameter of

2.5 m and above;

d) Axial flow, diagonal flow, tubular flow units with a nominal diameter of

3.3 m and above. System configuration of automation components (devices) of hydroelectric generating units, pumped-storage reversible units, and tidal generating units of less than the above range Placement and handover acceptance can be referred to.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document. Definition and selection of

GB/T 1048 pipe component PN (nominal pressure)

GB/T 2423.4 Environmental testing of electric and electronic products - Part 2. Test method test Db alternating heat (12h 12h cycle)

GB/T 3452.1 O-ring rubber seals for hydraulics - Part 1 . Dimension series and tolerances

GB/T 3452.2 O-ring rubber seals for hydraulics - Part 2. Appearance quality inspection standard

GB/T 8564 Hydrogenerator Set Installation Technical Specifications GB 11120 turbine oil

GB/T 12244 pressure reducing valve general requirements General technical conditions for

GB/T 13384 mechanical and electrical product packaging

GB/T 14048.1-2012 Low-voltage switchgear and control equipment - Part 1. General

GB/T 14048.16 Low-voltage switchgear and controlgear - Part 8. Loaded thermal protection (PTC) control for rotating electrical machines unit

GB 16280 linear heat detector

GB/T 17626.4 Electromagnetic compatibility test and measurement technology Electrical fast transient burst immunity test Technical guide for

GB/T 28570 hydroelectric generating set status online monitoring system

HG/T 2579 O-ring rubber ring material - Part 1. For general hydraulic systems