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

GB/T 7894-2023

Fundamental technical requirements for hydro-generators

水轮发电机基本技术要求

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document replaces GB/T 7894-2009 "Basic Technical Conditions for Hydrogenerators". Compared with GB/T 7894-2009, except for structural adjustments In addition to general and editorial changes, the main technical changes are as follows:

---Added 60Hz product content to the range (see Chapter 1);

---Added terms and definitions such as condenser, advance phase operation, late phase operation (see Chapter 3);

---Added the preferred rotation speed for 60Hz products (see 5.4);

---Added PQ diagram of turbine generator output (see 5.5);

- Changed the voltage and frequency change range (see 5.6, 5.5 of the.2009 version);
- Added the calculation method for apportioning the thrust bearing loss of the hydrogenerator from the total thrust bearing loss (see 5.7.6);
- Added requirements for ventilation losses and bearing losses to be corrected according to temperature and humidity (see 5.7.5, 5.7.6, 5.7.7);
- Added detailed values of electrical parameters and time constants as well as tolerance range requirements for reactance (see 5.8, 5.9);
- Changed the total harmonic distortion rate limit of the stator line voltage waveform (see 5.10, 5.8 of the.2009 version);
- The temperature rise limit requirements of the stator core have been changed (see 6.1,.2009 version of 6.1), and the temperature rise limit corresponding to the temperature rise limit has been added. Temperature rise test method and temperature measurement component layout requirements (see

1 Scope

China's national fundamental technical requirements for hydro-generators. China has more hydroelectric capacity than any other country by a wide margin, and the machines this standard covers are among the largest rotating machines ever built - the units at Baihetan are rated at a million kilowatts each. A hydro-generator is a salient pole synchronous machine coupled directly to the turbine, so it turns slowly, which is why it is enormous in diameter: the rotor rim of a large unit is a ring several metres across carrying poles whose retention against centrifugal force at runaway speed is a first-order design problem. The machines are assembled in the powerhouse rather than the factory, which is why site testing is part of the specification. The standard specifies the overall technical requirements, product identification, material and component storage, factory and site testing and supply requirements, applies to three-phase 50 or 60 Hz salient pole machines of 25 MVA and above directly coupled to a turbine, and may be referenced below that rating.

This document specifies the overall technical requirements, product identification, material and component storage, factory and site Testing and supply requirements, etc. This document is applicable to three-phase 50Hz/60Hz salient pole synchronous power generation directly connected to the hydraulic turbine and with a rated capacity of 25MVA and above. machine (hereinafter referred to as turbine generator). Hydro-generators with a rated capacity less than 25MVA shall refer to this standard.

Note. For special provisions on pumped hydro generator motors, see GB/T 20834.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 755 Ratings and performance of rotating electrical machines

GB/T 2900.25 Electrical terminology for rotating electrical machines

GB/T 8564 Technical Specifications for Installation of Hydrogenerator Sets

GB/T 10069.1 Determination methods and limits of noise of rotating electrical machines
Part