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Replacing GB/T 754-2007

Parameter series of steam turbines for power plant

发电用汽轮机参数系列

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document replaces GB/T 754-2007 "Parameter series of steam turbines for power plant". Compared with GB/T 754-2007, in addition to structural adjustments and editorial changes, the main technical changes in this document are as follows:

a) The maximum initial steam pressure range is changed from 31 MPa to 35 MPa. The maximum rated power level is changed from 1000 MW to 1 350 MW (see Chapter 1 of this Edition; Chapter 1 of Edition 2007);

b) The terms "initial steam parameter" and "supercritical parameter" and their definitions have been added (see 3.1 and 3.7 of this Edition). The definitions of "initial steam pressure", "initial steam temperature", " initial steam flow rate", "reheat temperature" and "heating pressure" have been changed (see 3.2~3.6 of this Edition; 2.1~2.5 of Edition 2007);

c) Various initial steam parameters have been added (see Table 1 ~ Table 3 of this Edition). The recommended range of initial steam flow rate has been deleted (see Table 1 ~ Table 3 of Edition 2007);

d) The initial steam parameters and reheat temperature series have been changed (see Table 2 and Table 3 of this Edition; Table 2 and Table 3 of Edition 2007);

e) The provisions for the allowable fluctuation range of steam inlet parameters of turbines during operation have been changed (see Chapter 5 of this Edition; Chapter 4 of Edition 2007).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority shall not be held responsible for identifying any or all such patent rights.

This document was proposed by China Electrical Equipment Industry Association.

This document shall be under the jurisdiction of National Technical Committee on Steam Turbine of Standardization Administration of China (SAC/TC 172).

The drafting organizations of this document: Shanghai Electric Power Plant Equipment Co., Ltd. Shanghai Steam Turbine Plant, Shanghai Power Generation Equipment Complete Design Institute Co., Ltd., Beijing Beizhong Steam Turbine and Electric Machine Co., Ltd., Hangzhou Steam Turbine Power Group Co., Ltd., Dongfang Electric Group Dongfang Steam Turbine Co., Ltd., Harbin Steam Turbine Plant Co., Ltd.,

Parameter series of steam turbines for power plant

1 Scope

This document gives initial steam parameter series of steam turbines for power plant and the allowable fluctuation range of steam inlet parameters during operation.

This document is applicable to steam turbines for stationary power generation or cogeneration with rated power levels of 0.75 MW~1350 MW and initial steam pressures of 1.28 MPa~35 MPa.

NOTE: Steam turbines for stationary power plant are of the condensing type. Steam turbines for cogeneration are of the back-pressure type, extraction back-pressure type, and extraction condensing type.

This document does not apply to nuclear power turbines, steam-gas combined cycle turbines, solar thermal power generation turbines, waste power generation and biomass power generation turbines, and waste heat power generation turbines.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 5578, *Fixed power plant steam turbine specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 5578 as well as the followings apply.

3.1 initial steam parameter

Steam parameters at the main steam valve inlet.

3.2 initial steam pressure

Steam pressure at the inlet of the main steam valve of the turbine.

NOTE: All steam pressure values in this document unless otherwise specified are absolute pressures.

3.3 initial steam temperature

The steam temperature at the inlet of the turbine main steam valve.

3.4 initial steam flow rate

The mass flow rate of new steam flowing into the main steam valve inlet of the turbine.

3.5 reheat temperature

The reheat steam temperature at the inlet of the reheat main steam valve (or reheat main steam and regulating combined valve) of the reheat steam turbine.

3.6 heating pressure

The heating steam pressure at the exhaust port of a back-pressure steam turbine, the extraction port of an extraction steam turbine, or the outlet of the pressure regulating valve installed on the heating extraction pipe.

NOTE: The heating pressure series and adjustable range of the cogeneration steam turbine are shown in Annex A.

3.7 supercritical parameter

Steam parameters are turbine inlet steam parameters with pressure and temperature higher than the critical point of water.

3.8 ultra-supercritical parameter

Steam turbine inlet parameters of which the steam parameters are higher than conventional supercritical parameters 24.2 MPa/566°C/566°C. Their initial steam temperature and/or reheat temperature is greater than or equal to 580°C, and/or initial steam pressure is greater than or equal to 28 MPa.

4 Initial steam parameter series

4.1 Overview

The initial steam pressure, temperature and initial steam flow rate corresponding to the typical power level can be selected according to the recommended data listed in Tables 1~3.

NOTE: The initial steam flow rate of steam turbines with rated power of 250 MW and below listed in Tables 1~3 is calculated based on the configuration of electric feedwater pumps.

4.2 Non-reheat steam turbine

The initial steam parameter series of non-reheat steam turbine is shown in Table 1.

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