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

GB/T 5578-2024

**Fixed power plant steam turbine specifications
(English Translation)**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting:

This document replaces GB/T 5578-2007 "Stationary Power Generation Steam Turbine Specifications": Compared with GB/T 5578-2007, except for the structural adjustment in addition to the integration and editorial changes, the main technical changes are as follows:

- a) Deleted some terms and definitions (see Chapter 3);
- b) Added "Product Safety" requirements (see Chapter 5);
- c) Added the requirement that the buyer should list in detail the load changes during the entire turbine design life [see 6.1:3d)];
- d) The method for determining the use of turbine bypass system has been changed (see 6.1:5, 6:1:5 of the:2007 edition);
- e) The exhaust absolute pressure requirement for back-pressure steam turbines has been changed (see 6.2:3, 6:2:3 of the:2007 edition);
- f) The speed requirements have been changed (see 6.2:5, 6:2:5 of the:2007 edition);
- g) Added the requirement that the buyer should provide boundary conditions for abnormal operation of the turbine (see 6.3:3);
- h) Added the provision that "materials not specified in domestic or international standards may be agreed upon by the buyer and seller" (see 7.1);
- i) The requirements for dynamic balancing of rotors after completion have been changed (see 7.4:1, 7:4:1 of the:2007 edition), and the methods and standards for dynamic balancing have been added:
(see 7.4:1);
- j) The critical speed provisions have been changed (see 7.4:2, 7:4:2 of the:2007 edition),

and the critical speed calculation requirements have been added (see 7.4:2);

k) Changed the requirements for overspeed test speed (see 7.4:3, 7.4:3 of the:2007 edition);

l) Added that the requirements for electrical faults in regional grid codes should be specified by the purchaser together with appropriate information on grid performance Requirements (see 7.4:4);

m) Added the provisions on the division of mechanical and torsional characteristics of the shaft system (see 7.4:5);

n) The provisions on steam screens for reheat steam turbines have been deleted (see 7.5 of the:2007 edition);

o) The requirements for the surface temperature of the insulation material have been changed (see 7.8, 7:8 of the:2007 edition);

p) Added welding requirements (see 7.9);

q) Added the requirement that the purchaser is responsible for determining the preferred building construction specifications (see 8.1);

r) The following clause has been deleted: The foundation designer should ensure that the foundation designed will not exceed the specified value due to the deflection, natural frequency and other characteristics of the foundation:

Provisions on adverse effects on the operation of the unit within the speed range (see 8.2 of the:2007 edition);

s) Added the requirements for coupling calculation of the damping system of the steam turbine unit and its foundation (see 8.2);

t) The requirement that the purchaser should ensure that the natural frequency of the foundation vibration does not coincide with any low-frequency multiple of the unit's operating speed to form resonance has been deleted:

(See 8.4 of the:2007 edition);

u) Added the requirement that the buyer provide all documents required for basic design (see 8.4);

v) The drive of the feedwater pump has been deleted (see Chapter 9 of the:2007 edition);

w) Added extraction and exhaust steam (see Chapter 9);

x) Changed the description of turbine feedwater reheating (see 9.6:2 and 17:5, Chapter 19 of the:2007 edition);

y) Added general rules for steam turbine auxiliary systems (see 10.1);

- z) Changed the oil return temperature requirement for main bearing operation [see 10.2:12, 10:11 of the:2007 edition)];
- aa) Added description on how to provide safety valves installed on steam pipes and who specifies their parameters (see 10.4);
- ab) Added the requirement that external steam pipes should have sufficient drainage capacity (see 10.5);
- ac) Integrate regulation, instrumentation, and protection systems into automatic control (see Chapter 11, Chapters 5, 11, and 12 of the:2007 edition) chapter);
- ad) Added general rules and regulations for automatic control (see 11.1 and 11:2);
- ae) Added general rules for steam turbine control systems (see 11.3:1);
- af) Changed the functional requirements of the regulation system (see 11.3:2, 5:1 of the:2007 edition);
- ag) Deleted the droop and sluggish rate characteristics of mechanical regulators (see Table 1 of the:2007 edition);
- ah) Added the operating characteristics of the electro-hydraulic control system (see 11.3:5);
- ai) Changed the requirements for valve testing (see 11.3:6, 5:4 of the:2007 edition);
- aj) Added requirements for steam turbine control system equipment (see 11.3:7);
- ak) Added requirements for auxiliary system control (see 11.3:8);
- a1) Added requirements for monitoring functions and/or information notification of steam turbine control systems (see 11.3:9);
- am) Added general requirements for turbine protection system [see 11.4:1:1d)~11:4:1:1f)];
- an) The scope of the automatic protection criteria has been changed (see 11.4:1:2, 12:2:4 of the:2007 edition);
- ao) The range of alarm values has been changed (see 11.4:1:3, 12:3 of the:2007 edition);
- ap) Deleted the provision that the overspeed protection system of small-power steam turbines should be able to be reset without stopping the machine (see 5.5:4 of the:2007 edition);
- aq) Deleted the rule that the overspeed protection device of a large-power steam turbine should be able to reset when the turbine speed drops to not less than the rated speed: (see 5.5:5 of the:2007 edition);
- ar) Added the provision that the overspeed protection system with internal test circuit design does not require a real overspeed test [see 11.4:1:4f)];