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**Specification for steam turbine safety protection systems in
thermal power plants**

火力发电厂汽轮机安全保护系统技术条件

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed by the China Electricity Council. This standard is under the jurisdiction of the National Power Station Process Monitoring and Information Standardization Technical Committee (SAC/TC376). This standard was drafted by: State Grid Hunan Electric Power Co., Ltd. Electric Power Research Institute, Hunan Xiangdian Test and Research Institute Co., Ltd., Shanghai Haixinhua Control Technology Group Technology Co., Ltd., Inner Mongolia Electric Power Research Institute, State Grid Zhejiang Electric Power Co., Ltd. Electric Power Scientific Research Institute, Energy Technology Co., Ltd. of Guangdong Electric Power Research Institute. The main drafters of this standard. Zhu Xiaoxing, Chen Houtao, Liu Wulin, Wang Xihui, Wang Zhijie, Zhang Jianling, Xunxin, Chen Guangyuan, Zhang Guobin, Su Ye, Ma Jun, Pan Fengping, Wang Bochun, Fu Qiang, Luo Zhihao. Steam turbine safety of thermal power plant Technical condition of protection system

1 Scope

China's national specification for the safety protection system of a steam turbine in a thermal power plant. It specifies the terms and definitions, the general provisions and the application functions, beginning with the basic requirements. This is the system that trips the turbine, and it is deliberately separate from the control system that governs it. The distinction is the whole architecture: the control system modulates steam to hold speed and load, and the protection system does one thing - close the steam valves completely and immediately when a condition arises that would destroy the machine. Overspeed is the first of those, because a turbine that loses its load and keeps steam will burst; the others are loss of lubricating oil, excessive vibration, axial displacement of the rotor, low condenser vacuum and high bearing temperature. Each is measured redundantly and voted, because a protection system that trips spuriously is disconnected by operators, and one that fails to trip destroys the plant.

This standard specifies the functions, performance indicators and technical requirements of the thermal power plant steam turbine safety protection system. This standard applies to the steam turbine safety protection system of units with a unit capacity of 300MW and above in thermal power plants, and steam turbines of other capacity units. The machine safety protection system can be implemented by reference.

2 Normative references

The following documents are essential for the application of this document. For dated reference documents, only the dated version applies to this article. For the cited documents without date, the latest version (including all amendments) applies to this document.

GB/T 2421.1 Overview and Guidelines for Environmental Testing of Electrical and Electronic Products

GB 3836.2 Explosive environment Part

3 Terms and definitions

The terms and definitions defined in GB/T 26863-2011 and the following apply to this document. For ease of use, the following list is repeated. Certain terms and definitions in GB/T 26863-2011.

3.1 Steam turbine emergency trip system emergency trip system; ETS When an abnormality occurs during the operation of the steam turbine, the necessary measures can be taken to deal with it, and the abnormal situation continues to develop to the point that may endanger the design. When preparing for personal safety, an automatic control system that can take drastic measures to stop the operation of the steam turbine. [GB/T 26863-2011, definition 7.13.1]