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

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**Technical conditions of power energy substitution equipment
access to power grid -- Part 2: electric boiler
(English Translation)**

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Foreword

--Part 1: General rules;

--Part 2: Electric boiler;

--Part 3: Distributed electric heating equipment.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

Please note that certain contents of this standard may involve patents, and the issuing organization of this document does not bear the responsibility for identifying these patents.

This part was proposed by the China Electricity Council.

This part is under the jurisdiction of the National Smart Grid User Interface Standardization Technical Committee.

1 Scope

This section specifies requirements for electric boiler equipment to connect to the power grid, line protection requirements, measurement requirements, access performance requirements, and information about the power grid Interaction requirements and testing requirements.

This part is applicable to the design, production, procurement and installation of 35kV, 10kV and 220V/380V voltage level electric boiler equipment connected to the grid and operation and maintenance management and other processes, 6kV, 20kV voltage level electric energy substitution equipment can be connected to the grid with reference to 10kV

implementation.

Wall-mounted electric heating equipment, household electric heating equipment, etc. do not apply to this standard.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. For undated references, the latest version (including all amendments) applies to this document.

GB/T 156 standard voltage GB/T 10820 Thermal efficiency and thermal test methods for domestic boilers GB/T 14285 Technical Regulations for Relay Protection and Safety Automatic Equipment GB/T 14549 Power quality public grid harmonics GB/T 14598.9 Measuring Relays and Protection Devices Part 22-3. Electrical Disturbance Test-Radiated Electromagnetic Field Immunity GB/T 14598.10 Measuring Relays and Protection Devices Part 22-4. Electrical Disturbance Test Electrical Fast Transient/Pulse Group Immunity Test GB/T 14598.13 Electrical Relay Part 22-1. Electrical Disturbance Test of Measuring Relays and Protection Devices 1MHz Pulse Group Resistance Disturbance test GB/T 14598.14 Measuring Relays and Protection Devices Part 22-2. Electrical Disturbance Test-Electrostatic Discharge Test GB 50052 Code for Design of Power Supply and Distribution System GB 50053 20kV and below substation design code GB 50054 Low Voltage Power Distribution Design Code GB 50056 Code for Design of Electric Heating Equipment Power Installation GB 50059 35kV~110kV Substation Design Code DL/T 448 Technical Management Regulations for Electric Energy Metering Devices

3 Definition of terms

The following terms and definitions apply to this document.

Electric boiler

A complete set of electric heating equipment that uses the input electric energy to produce hot water, steam, hot air or other heat medium, and is fixedly installed. Press whether Equipped with heat storage device, electric boiler equipment is divided into two categories. heat storage electric boiler and direct heating electric boiler; according to the heating principle, it is divided into resistance type (referred to by Resistance element heating) boiler equipment, electrode boiler equipment, electromagnetic boiler equipment, etc.

4.1 General principles

The electric boiler should meet the following requirements when connected to the grid.

- a) The regulations that should be met;
- b) Do not endanger the personal safety of the public or operators;

- c) It should not affect the safe and stable operation of the power grid;
- d) The short-circuit capacity of the electric boiler should be less than the short-circuit capacity of the public grid access point;
- e) The connection point between the electric boiler and the power grid should adopt a circuit breaker that is easy to operate, lockable, and has manual and automatic operation;
- f) The interface device between the electric boiler and the power grid should meet the withstand voltage level of the electrical equipment of the corresponding voltage level.

4.2 Access method

The way that the electric boiler is connected to the grid should meet the following requirements.

- a) Electric boilers powered by 220/380V and power less than or equal to 10/30kVA should be connected to the low-voltage distribution box;

The power supply line is connected to the power distribution cabinet of the power distribution room;

- b) Electric boilers powered by 10kV should be powered by a dedicated loop;
- c) Electric boilers powered by 35kV power supply should be constructed with a power distribution system.

4.3 Requirements for voltage level selection

The voltage level of the electric boiler equipment connected to the grid should be based on the local grid situation, the electric capacity of the electric boiler equipment, and the optional power supply of the electric boiler equipment the voltage is determined and should meet the requirements of GB/T 156; when the power supply distance is relatively close and conditions permit, the electric boiler equipment should choose 10kV Power supply; when the transmission distance is long, a higher voltage power supply should be selected to reduce transmission and distribution losses and costs, and should be listed in Table 1.

Choose from the power supply voltage level.

4.4.1 Operating environment

During the design, installation and use of power distribution, relevant environmental factors should be considered, including. altitude, ambient temperature, relative humidity, in terms of seismic grade, substations of 10kV and below should meet the requirements of GB 50053, and substations greater than 10kV should meet the requirements of GB 50059.

4.4.2 Power distribution requirements

For electric boilers with a capacity greater than or equal to 25 MW, an independent power distribution system should be adopted. Other requirements are as follows.

- a) For applications where heat is supplied only by electric boiler equipment, the power distribution should be based on load above level 2, and the auxiliary equipment should also be 2 Class load distribution;
- b) In addition to the heating of electric boiler equipment, if there are other applications where there are other backup heating sources, the power distribution can be based on the level 3 load, but the boiler Auxiliary equipment and other equipment should be distributed according to load above level 2.

4.4.3 Distribution capacity

The power distribution capacity should meet the capacity requirements of the installed electric boiler equipment, including the power distribution capacity requirements of auxiliary equipment, and the design of the power supply and distribution system it should meet the requirements of GB 50052, and the design of electric boilers should meet the requirements of GB 50056.

4.5 Principles of protective grounding

When the electric boiler is connected to the power grid and equipped with a transformer, the protective grounding method of the electric boiler should be considered. According to the actual protective grounding method of the electric boiler, Line distribution design.

4.6 Requirements for distribution method

The power distribution laying method requirements are as follows.

- a) When the electric boiler equipment less than or equal to 8MW is connected to the power grid, the outdoor part can adopt the overhead or underground line method;
- b) When electric boiler equipment larger than 8MW is connected to the power grid, the outdoor part should adopt the direct-buried line method of casing or the installation of underground integrated pipe gallery.

Installation method

- c) When an electric boiler larger than or equal to 25MW is connected to the power grid, if it is close to the existing substation, it can be directly connected to the existing substation; if it is far away from the existing substation. After technical and economic comparison, it is advisable to build a special substation.