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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 1: General rules
(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 part specifies the basic regulations, technical requirements, protection and metering requirements, and performance requirements for electric energy alternative equipment to connect to the power grid.

Requirements, equipment and power grid interaction functions, communication and information security requirements, and testing and acceptance requirements.

This part is applicable to the design, manufacturing, testing, and operation of the electric

power substitute equipment of 35kV, 10kV and 220V/380V voltage levels connected to the power grid.

According to Wei et al., 6kV and 20kV voltage level electric energy substitute equipment can be connected to the grid with reference to 10kV.

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 311.1 Insulation coordination Part 1: Definitions, principles and rules GB 4824 Industrial, scientific and medical (ISM) radio frequency equipment disturbance characteristic limits and measurement methods GB 5226.1 Electrical Safety of Machinery Electrical Equipment of Machinery Part 1: General Technical Conditions GB/T 12326 Power quality voltage fluctuation and flicker GB/T 14285 Technical Regulations for Relay Protection and Safety Automatic Equipment GB/T 14549 Power quality public grid harmonics GB/T 15543 Three-phase voltage unbalance degree of power quality GB/T 17626.2 Electromagnetic compatibility test and measurement technology Electrostatic discharge immunity test GB/T 17626.3 Electromagnetic compatibility test and measurement technology Radio frequency electromagnetic field radiation immunity test GB/T 17626.4 Electromagnetic compatibility test and measurement technology Electrical fast transient pulse group immunity test GB/T 17626.5 Electromagnetic compatibility test and measurement technology surge (impact) immunity test GB/T 17626.11 Electromagnetic compatibility test and measurement technology Voltage sag, short-term interruption and voltage change immunity test GB/T 24337 Power Quality Interharmonics in Public Grid GB/Z 29328 Technical specification for power supply and self-provided emergency power supply configuration for important power users GB/T 31960.03 Technical Specification for Power Energy Efficiency Monitoring System Part 3: Communication Protocol GB 50054 Low Voltage Distribution Network Design Code GB 50061 66KV and below overhead power line design code GB 50065 Grounding design code for AC electrical installations GB 50217 Power Engineering Cable Design Standard DL/T 448-2016 Technical Management Regulations for Electric Energy Metering Devices DL/T 698.31 Electric energy information acquisition and management system Part 3-1. General requirements for technical specifications of electric energy information acquisition terminals

3 Definition of terms

The following terms and definitions apply to this document.

Electric energy substitute equipment the equipment is driven by electric energy to realize the same functions as coal-fired, oil-fired, and gas-fired driving devices. But a single device,

it can also contain software Complete sets of equipment including parts and multiple equipment. According to the type of energy converted from electric energy, the electric energy substitution equipment is divided into electric heating/cooling, electric conversion There are two types of power.

Electric heating/cooling equipment A device that is driven by electric energy and ultimately produces heat/cold energy. According to the application of equipment in different industries, it can be divided into building heating/cooling, engineering/There are three types of heating/cooling for agricultural production and electric heating for household use.

Electric driving equipment the equipment that is driven by electric energy and finally produces kinetic energy can be divided into industrial/agricultural production, transportation and transportation according to the application of equipment in different industries.

Lose in two categories.

4.1 Electric heating/cooling

Electric heating/cold electric energy alternative equipment can be divided into building heating/cooling equipment, industrial/agricultural production heating/cooling equipment, Three categories of household electric heating equipment.

a) Building heating/cooling equipment. mainly including electric boilers, distributed electric heating (carbon crystal plates, heating cables, electric heating films, etc.), heat pumps, etc.

Building electricity heating equipment and central air conditioning and other building electricity cooling equipment;

b) Heating/cooling equipment for industrial/agricultural production. provide heating/cooling equipment for industrial/agricultural production processes, mainly including electric kilns, industrial electricity Heating equipment such as boilers and metallurgical electric furnaces and refrigeration equipment such as industrial central air-conditioning;

c) Household electric heating equipment. mainly includes household electric heating equipment such as induction cookers, electric kettles, and electric water heaters.

4.2 Electric rotation force

According to different main purposes, electric power substitute equipment for electric power can be divided into two categories. industrial/agricultural production equipment and transportation equipment.

a) Industrial/agricultural production equipment. mainly refers to equipment driven by motors, which can be divided into auxiliary electric power according to different application scenarios Equipment, mining equipment, agricultural electric drainage and irrigation equipment, agricultural auxiliary production equipment, oil field drilling rigs, oil and gas pipeline power pressurization equipment Waiting

b) Transportation equipment. mainly includes electric vehicles, rail transit, port shore power, airport bridge-mounted APU and other equipment.

5.1 General requirements for grid connection

The general requirements for access to the grid are as follows.

a) There should be corresponding safety protection measures for electric energy substitution equipment connected to the grid, and should not affect the safe operation of the grid;

b) The voltage level of access to the power grid is generally based on the local power grid conditions, the power consumption capacity of electric energy replacement equipment, and the simultaneous rate of power equipment, etc.

Factors, determined after technical and economic comparison, need to meet the requirements of relevant grid standards;

c) The power configuration of important power users should meet the requirements of the GB/Z 29328 standard.

5.2 Voltage level

When electric energy substitute equipment is connected to the grid, the connected power supply voltage should be determined according to the capacity of the electrical equipment and the total capacity of the power receiving transformer Level, the selected standard voltage should meet the requirements of GB/T 156, and the power supply voltage level can generally be determined in Table 1.

5.3 Access method

The access method requirements are as follows.

a) 220/380V power supply electric energy substitute equipment, when the capacity is not more than 10/30kVA, it should be connected to the low-voltage distribution box; when it is larger, it should be connected Dedicated circuit for power distribution cabinet into the substation and distribution room;

b) Electric energy substitute equipment connected to 10kV grid, less than.2000kVA should be connected to ring network room (box) or T connected to overhead line, 2000~ 4000kVA should be connected to a 10kV switching station, and a dedicated line with a capacity greater than 4000kVA should be connected;

c) Electric energy substitute equipment connected to the 35kV grid should be connected to substations and switchyards.