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

GB 50229-2019

**Standard for design of fire protection for fossil fuel power
plants and substations**

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1 General

1.0.1 This standard is formulated to ensure the fire safety of thermal power plants and substations, prevent fires or reduce fire hazards, and ensure personal and property safety.

1.0.2 This standard applies to the following newly built, rebuilt and expanded thermal power plants and substations.

1 Coal-fired thermal power plants with units of 1000MW or below (hereinafter referred to as "coal-fired power plants");

2 Simple cycle or gas-steam combined cycle power plants with standard rated gas turbine output of 400MW or below (hereinafter referred to as "gas turbine power plants");

3 Substations and converter stations with a voltage of 1000kV and below.

1.0.3 The fire protection design of thermal power plants and substations should be combined with the specific conditions of the project, and actively adopt new technologies, new processes, new materials and new equipment, so as to be safe and applicable, advanced in technology, and economical and reasonable.

1.0.4 The fire protection design of thermal power plants and substations shall not only comply with this standard, but also comply with the current relevant national standards.

2.0.1 main power house

The main factory building of a coal-fired power plant is composed of a steam turbine room, a centralized control building (machine furnace control room), a deaeration room, a coal bunker room, and a boiler room.

The main building of a gas turbine power plant is composed of a gas turbine room, a steam turbine room, a centralized control room, and a waste heat boiler.

2.0.2 central control building

In thermal power plants, it is a workshop for centralized control of two or more units and auxiliary systems. Including centralized control room, electronic equipment room, cable

interlayer, battery room, shift room and auxiliary rooms, etc.

2.0.3 main control building electrical control building

The building where the main electrical system is under centralized control in the non-unit control mode in the thermal power plant, and the building where the main electrical system and equipment are under centralized control in the substation. It is generally composed of the main control room, electronic equipment room, cable interlayer, battery room, shift room and auxiliary rooms.

2.0.4 network control building network control building

A building in a thermal power plant that independently controls the power network system or equipment of the booster station. It is generally composed of electronic equipment rooms, battery rooms and auxiliary rooms, and is usually an unattended building.

2.0.5 Network relay room switchgear control building

The building that controls the main electrical equipment of the main switch station and auxiliary switch station in the thermal power plant.

2.0.6 power distribution building

A building that receives, distributes and controls electrical energy in a thermal power plant. Generally, it is composed of indoor power distribution equipment room, high and low voltage power distribution room, etc.

2.0.7 special warehouse

The warehouse for storing lubricating oil and gas cylinders such as hydrogen, oxygen and acetylene.

2.0.8 general warehouse

Warehouses for storing precision instruments, steel and general equipment, including general equipment warehouses, precision equipment warehouses, steel warehouses and auxiliary rooms, etc.

2.0.9 indoor coal yard

Coal storage buildings with closed roofs and outer enclosures, including round coal yards and strip coal yards.

2.0.10 liquid ammonia area

When liquid ammonia is used as denitrification reducing agent, the area for liquid ammonia

unloading, storage and preparation of ammonia gas, including power distribution room, ammonia unloading compressor, liquid ammonia storage tank, liquid ammonia evaporator, ammonia buffer tank, ammonia gas dilution Tanks, waste water tanks and waste water delivery pumps, pipelines and valves, etc.

2.0.11 Valve hall

For buildings with converter valves, usually a valve hall is arranged with a converter valve and related equipment for one pole.

3 Fire hazard classification, fire resistance class and fire protection zone of coal-fired power plant buildings (structures)

3 Fire Hazard Classification, Fire Resistance Class and Fire Zoning of Coal-fired Power Plant Buildings (Structures)

3.0.1 The fire hazard of production shall be classified according to the nature and quantity of the substances used or produced in production, and the fire hazard of stored items shall be classified according to the nature of the stored items and the quantity of combustibles in the stored items, and All shall meet the requirements in Table 3.0.1.

3.0.2 The combustion performance and fire resistance rating of the building components of the power plant shall comply with the relevant provisions of the current national standard "Code for Fire Protection Design of Buildings" GB 50016, and the boiler room of the main factory building may use metal load-bearing components without fire protection.

3.0.3 The maximum permissible building area of the above-ground fire compartment of the main factory building shall meet the following requirements.

1 The building area of 600MW and below units shall not be larger than 6 units;

2 The construction area of 600MW and above units and 1000MW units shall not be larger than 4 units;

4.0.8 The layout of the fire station shall meet the following requirements.

1 The fire station should be arranged at a moderate position in the factory area, avoiding the main flow of people, so as to ensure that the fire truck can reach the fire scene conveniently and quickly;

2 The main entrance of the garage of the fire station shall face the road in the factory area, and the distance from the edge of the road in the factory area should not be less than 15.0m.

4.0.9 The distance between the oil-immersed transformer and the turbine room, indoor power distribution equipment building, main control building, centralized control building and network control building shall not be less than 10m; Appropriately reduce.

4.0.10 When the plant area adopts a stepped vertical arrangement, the flammable liquid storage tank area should not be adjacent to and arranged on steps higher than the important facilities or personnel concentration places of the whole plant. If it is really necessary to be adjacent to and arranged on steps higher than the above places, measures should be taken to prevent the spread of fire and the spread of flammable liquids.

4.0.11 The layout of the ignition tank area shall meet the following requirements.

1 shall be arranged separately;

2 A fence wall of 1.8m high shall be set up around the ignition oil tank area; when the fence of the factory area is used as the fence of the ignition oil tank area, the fence wall of this section of the factory area shall be a solid fence wall of 2.5m high;

3 The design of the ignition tank area shall comply with the relevant provisions of the current national standard "Code for Design of Petroleum Storage" GB 50074.

4.0.12 The layout of hydrogen production station and hydrogen supply station shall meet the following requirements.

1 It should be arranged as an independent building (structure);

2 Non-combustible solid walls with a height of not less than 2.5m should be set around the hydrogen production station and hydrogen supply station;

3 The design of hydrogen production station and hydrogen supply station shall comply with the relevant provisions of the current national standard "Code for Design of Hydrogen Station" GB 50177.

4.0.13 The layout of the liquid ammonia area shall meet the following requirements.

1 The liquid ammonia area should be arranged separately at the edge of the factory area with good ventilation conditions, avoiding places where people gather and the main entrances and exits of people, and should be located on the windward side of the annual minimum frequency wind direction of the factory area;

2 The liquid ammonia area shall be provided with a non-combustible solid fence with a height of not less than 2.2m; when the factory fence is used as the fence of the ammonia zone, this section of the fence shall adopt a non-combustible solid fence with a height of not less than 2.5m;

3 Liquid ammonia storage tanks shall be provided with fire dikes, which shall comply with the relevant provisions of the current national standards "Code for Fire Protection of Building Design" GB 50016 and "Code for Design of Fire Dikes for Storage Tank Farms" GB 50351.

4.0.14 The comprehensive layout of pipelines and power lines in the plant area shall comply with the following regulations.