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**Code for design of fire protection for conventional island in
nuclear power plants**

核电厂常规岛设计防火规范

(English Translation)

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1 General

1.0.1

This specification is formulated to prevent fires in the conventional island of nuclear power plants, reduce fire hazards, and ensure the safety of people, property and nuclear power plants.

1.0.2

This code is applicable to the fire protection design of conventional islands of pressurized water reactor nuclear power plants with a single unit generating capacity of turbo-generator units of one million kilowatts and below.

1.0.3

The fire protection design of conventional islands should implement the relevant national policies, and achieve overall consideration, safety, reliability, advanced technology, and economical applicability.

1.0.4

The fire protection design of conventional islands of nuclear power plants shall not only comply with the provisions of this code, but also comply with the relevant current national standards.

2.0.1 Conventional island

A collective term for steam turbine generator sets and their supporting facilities, buildings (structures).

2.0.2 Turbine building

A comprehensive building consisting of a turbine room, deaeration room, condensate polishing room, lubricating oil transfer room, etc.

2.0.3 Main switchgear station main switchgear station

High-voltage electrical devices and buildings (structures) that transmit electric energy to the grid and provide normal starting power to the unit.

2.0.4 Auxiliary switchgear station auxiliary switchgear station

High-voltage electrical installations and buildings (structures) that provide normal backup and maintenance power to the factory power system.

2.0.5 Network relay room switchgear control building

The building that controls the main electrical equipment of the main switching station and auxiliary switching station.

2.0.6 Auxiliary boiler house

It is a comprehensive building that provides auxiliary steam for the startup or shutdown of the turbo-generator set, mainly the auxiliary boiler room.

3 Fire hazard classification and fire resistance level of buildings (structures)

8 For several factory buildings with fire resistance rating not lower than Class II (unless otherwise specified in this code), the fire hazard shall be Class C, and the total floor area shall not exceed 8000m² (single-storey) or 4000m² (multi-storey), or D The buildings (structures) of Category E not exceeding 10000m² (single and multi-storey) can be arranged in groups, and the distance between buildings (structures) in a group. when the height of the buildings (structures) does not exceed 7m, the spacing should not be less than 4m; when the building height exceeds 7m, the spacing should not be less than 6m.

9 The distance from the emergency oil storage pool to the production buildings (structures) with fire hazards of Category C, D and E (Class I and II fire resistance grades) shall not be less than 5m.

10 The spacing between buildings (structures) not mentioned in this table shall be implemented in accordance with the relevant provisions of the current national standard "Code for Fire Protection Design of Buildings" GB 50016.

4.0.6 The circular fire lanes should be set up around the steam turbine generator building (including nuclear island), switch station and oil tank area, and around other buildings (structures). The fire lane can use the traffic road in the plant.

4.0.7 In addition to meeting the requirements of the overall plan and the relevant provisions of the current national standard "Code for Design of Factory and Mine Roads" GB J 22, the design of fire protection roads in the plant area should also meet the following provisions.

1 The nuclear power plant site shall be provided with not less than two entrances in different directions, and their positions shall be convenient for fire-fighting vehicles to drive;

2 The turning radius of the road shall meet the needs of fire vehicles and shall not be less than 9m.

5.1 Fire compartments of buildings (structures)

5.1.1

Fire separation shall be carried out for the following places in the steam turbine generator building.

- 1 Cable shaft, cable interlayer;
- 2 Electronic equipment room, power distribution room, battery room;
- 3 ventilation equipment room;
- 4 lubricating oil room, lubricating oil transfer room;
- 5 Evacuation stairs

5.1.2

The steam turbine generator building may not be divided into fire compartments, and the mechanical processing workshops with different fire hazards in the non-radioactive maintenance workshop should be divided into different fire compartments.

5.1.3

The length of each fire compartment in cable trenches, cable tunnels and integrated corridors containing oil pipelines or cables shall not exceed 200m, and fire separation measures shall be taken every 50m.

5.1.4

Category C warehouses should be arranged separately. When Category C warehouses are set up in Category D and E factories (warehouses), the following requirements shall be

met.

1 The construction area of Category C warehouse shall be smaller than the permissible construction area of a fire compartment;

2 Class C warehouses are separated from other parts by firewalls and floors with a fire resistance rating of not less than 1.50h, and the doors on the firewalls are Class A fire doors;

3 An automatic fire extinguishing system shall be installed.

5.1.5

Class A and Class B warehouses should be arranged separately. When it needs to be combined with other warehouses, it should meet the following requirements.

1 The warehouse should be a single-storey building;

2. Explosion-proof measures and pressure relief facilities should be taken for the storage of Category A and B articles;

3 The parts storing Class A and B articles should be separated from other parts by anti-blast protective walls, and the load-bearing structures between them should be independent

5.2 Safe evacuation of factory building (warehouse)

5.2.1

The distance from the farthest working place on the ground in the factory building to the external exit or evacuation stairs should not be greater than 75m; the distance from the farthest working place on the underground part of the factory building to the evacuation stairs should not be greater than 45m.

5.2.2

The evacuation stairs of the steam turbine generator building shall adopt enclosed stairwells or outdoor stairs.

5.2.3

The Class A fire door on the firewall leading to the adjacent fire compartment can be used as the second safety exit for the factory (warehouse) room and cable tunnel.

5.2.4

There should be no less than two safety exits on each floor of the main and auxiliary switching stations, and the straight-line distance from the farthest indoor working place to the nearest safety exit should not be greater than 30m.