

ICS 29.240

DL

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

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Technical code for the design of 220kV ~ 750kV substation

220kV~750kV变电站设计技术规程

(English Translation)

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Explanations of wording in this standard

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1 General provisions

1.0.1 In order to meet the needs of national and industry standardization

1 General provisions

1.0.1

In order to meet the needs of national and industry standardization construction, reach a unified standard technical principle for design of substation, allow the design of substation to meet the relevant national policies, laws, regulations, reach the requirements of safety and reliability, advanced and applicability, energy saving and environmentally friendly, it hereby develops this standard.

1.0.2

This standard is applicable to the design of the newly built, reconstructed, extended work of substation (switchyard) which has an AC voltage of 220kV ~ 750kV.

1.0.3 Substation design shall be combined with engineering features, actively

and deliberately adopt new technologies, new device, new materials, new processes with application conditions.

1.0.4 In addition to the implementation of this standard, the design of substation shall also comply with the relevant national standards.

2 Terms

2.0.1

Substation

Part of the power system, which is concentrated in a defined location, including terminals, switches and control device, buildings and transformers for power transmission or distribution. It usually includes the facilities (such as protective devices) required for the safety and control of power system.

2.0.2

Uninterruptible power supply the power supply which consists of a battery pack, an inverter, other circuits, that provides AC power when the power grid is out of power.

2.0.3

Substation automation system A computer application system that implements functions such as information collection, processing, monitoring, control, operation management of substation based on computer, network, communication technologies.

2.0.4

Unattended operation mode an operation management mode, in which the operation monitoring of the substation and the main control operation are carried out by the remote control end, the device of the substation is regularly patrolled and maintained.

There are no on-duty personnel in the substation for fixed operation and maintenance.

3 Selection of the substation location

3.0.1

The site selection of the substation shall be based on the network structure, load distribution, urban-rural planning, land acquisition & demolition and the following provisions of the power system planning and design. It shall use technical and economic comparison and economic benefit analysis to select the optimal solution of site location.

3.0.4

The selection of substation's location shall be based on transportation conditions and substation's construction needs, facilitating the connection of incoming roads and large-piece transportation.

3.0.5

The substation's location shall have suitable geological and topographical conditions. It shall avoid unfavorable geological structures such as landslides, debris flows, subsidence zones, earthquake-fracture zones. It should avoid submerged caves, goafs, exposed and concealed river ponds, shore scouring areas, areas prone to rolling stones, try to avoid or reduce damage to forests and natural landscapes.

3.0.8 There shall be a reliable source of water for production and domestic use

near the substation's location. When groundwater is used as a water source, it shall carry out hydrogeological surveys or explorations, submit report.

3.0.9 There shall be reliable power supply around the substation's location

which meet the requirements of substation construction and external power supply for station service.

3.0.12 The seismic fortification intensity of the substation's location shall comply with the current national standard "Seismic ground motion parameter zonation map of China" GB 18306.

4.1 Plan of the substation

4.1.1

The general plan of the substation shall be coordinated with the local urban planning or industrial zone planning. It should make full use of the nearby public facilities such as traffic, water supply and drainage, flood control.

4.1.3

For the substation in flood control and seismic fortification areas, it shall, based on such factors as geology and topography, arrange the main production constructions (structures) in relatively favorable areas.

4.1.4

The positioning of substation's location shall rationally use geological and topographical conditions. For the high and steep slope, it shall analyze its stability and the impact on the building and structures, take safety measures to prevent human and animal from falling.

4.2 General layout

4.2.1

The combination of plane and space of substation buildings shall, according to the process requirements, make full use of natural terrain, to ensure that the layout is compact and reasonable and the expansion is convenient.

4.2.5

The fire hazard category and minimum fire resistance rating of each building and structure of the substation shall not be lower than those specified in Table 4.2.5. The design of the entire building and structure and their components shall comply with the relevant provisions on fire prevention in addition to the use function.

4.2.6

The minimum spacing of the building and structure in the substation shall not be less than that specified in Table 4.2.6.

4.3 Vertical arrangement

4.3.1

The vertical design of the substation shall be carried out simultaneously with the general layout, meanwhile shall be coordinated with the elevations of the existing and planned roads, drainage systems, surrounding sites outside the substation.

4.5 Road

4.5.1

The path of the substation's access road shall be determined comprehensively according to the current situation of the road around the site, combined with the long-term development plan, the substation plan and vertical layout design.

4.6 Site treatment

4.6.1

In the outdoor power distribution device area, it should set the operation floor according to the process requirements.

4.6.2

The substation site may adopt such treatment measures as gravel, pebble pavement or lime soil closure, or it may be properly greened.