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**Code for design of 35kV~110kV substation
(English Translation)**

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1 General

1.0.1

In order to standardize the design of substations, make the design of substations conform to relevant national policies and regulations, and meet the requirements of safety, reliability, and economical rationality, this specification is formulated.

1.0.2

This code is applicable to the substation design of new construction, expansion and reconstruction projects with a voltage of 35kV~110kV and a single transformer capacity of 5000kV·A and above.

1.0.3

The design of the substation should be carried out according to the 5-10-year development plan of the project, to achieve a combination of long-term and short-term, focus on the short-term, correctly handle the relationship between short-term construction and long-term development, and reserve expansion as needed possible.

1.0.4

The design of the substation should proceed from the overall situation, make overall plans, and reasonably determine the design scheme according to the load nature, power consumption capacity, and environmental characteristics, combined with the regional development level.

1.0.5

The design of substations should adhere to the principle of saving resources and taking social benefits into consideration.

1.0.6

The design of the substation shall not only comply with this specification, but also comply with the current relevant national standards.

2 Station site selection and station layout

2.0.1

The site selection of the substation shall comply with the relevant provisions of the current national standard "Code for General Layout Design of Industrial Enterprises" GB 50187, and shall meet the following requirements.

- 1 Should be close to the load center.
- 2 The layout of substations should take into account the requirements of planning, construction, operation, construction, etc., and should save land.
- 3 It should be coordinated with the planning of urban and rural areas or industrial and mining enterprises, and it should be convenient for the introduction and extraction of overhead and cable lines.
- 4 Transportation should be convenient.
- 5 The surrounding environment should be free from obvious pollution. When the air is polluted, the site should be located at the place least affected by the pollution source.
- 6 The substation should avoid interaction with adjacent facilities, avoid fire, explosion and other sensitive facilities, and the site selection and design of substations adjacent to explosive hazardous gas areas should comply with the current national standard "Explosion and Fire Hazardous Environments" Relevant provisions of GB 50058 Code for Design of

Power Installations.

7. It should have suitable geological, topographical and topographical conditions. The station site should avoid choosing a mineral deposit site with important cultural relics or mining that will affect the substation. If it cannot be avoided, the consent of the relevant department should be obtained.

8 The elevation of the station site should be at the high water level once in 50 years. If it is unavoidable, the station area should have reliable flood control measures or be consistent with the flood control standards of the region (industrial enterprises), and should be higher than the waterlogging level.

9 The main building of the substation should be coordinated with the surrounding environment.

2.0.2

The substation shall select the appropriate type of power distribution device according to the characteristics of the area where it is located, and the seismic design shall comply with the relevant provisions of the current national standard "Code for Seismic Design of Electric Power Facilities" GB 50260.

2.0.3

Substations in urban centers should choose miniaturized and compact electrical equipment.

2.0.4

The layout of the main transformer of the substation should be not only convenient for transportation, but also should be arranged in a position where the operating noise has little impact on the surrounding environment.

2.0.5

The physical wall of the outdoor substation should not be lower than 2.2m. The wall form of urban substations and enterprise substations should be coordinated with the surrounding environment.

2.0.6

The width of the main road in the substation to meet the fire protection requirements should be 4.0m. The width of the main equipment transportation road can be determined according to the transportation requirements, and should have the conditions for carriage return.

2.0.7

The site design slope of the substation should be determined according to the equipment layout, soil conditions and drainage methods. The slope should be 0.5% to 2%, and should not be less than 0.3%. The slope parallel to the direction of the busbar should meet the

requirements of electrical and structural layout. requirements. The maximum slope of the road should not be greater than 6%. When the roadside open ditch is used for drainage, the longitudinal slope of the ditch should not be less than 0.5%, and the local difficult section should not be less than 0.3%.

The bottom longitudinal slope of cable trenches and other similar trenches should not be less than 0.5%.

2.0.8

The building elevation, foundation burial depth, subgrade and pipeline burial depth in the substation should be coordinated with each other; the ground elevation inside the building should be 0.3m higher than the ground outside the house, and the wall of the cable trench outside the house should be 0.1m higher than the ground.

2.0.9

The minimum clear distance between various underground pipelines and between underground pipelines and buildings, structures and roads shall meet the requirements of safety, maintenance, installation and workmanship.

2.0.10

The greening planning of the substation area should adapt to the surrounding environment and prevent the greening from affecting safe operation.

3.1 Main Transformer

3.1.1

The number and capacity of main transformers should be comprehensively determined according to regional power supply conditions, load nature, power consumption capacity and operation mode.

3.1.2

Two main transformers should be installed in substations with primary and secondary loads. When the technology and economy are reasonable, more than two main transformers can be installed. When the substation can obtain working power with sufficient capacity from the medium and low voltage side grids, a main transformer can be installed.

3.1.3

For a substation equipped with two or more main transformers, when one main transformer is disconnected, the capacity of the remaining main transformers (including overload capacity) shall meet the requirements of all primary and secondary loads.

3.1.4

In a substation with three voltages, when the power passing through the windings on each side of the main transformer reaches more than 15% of the rated capacity of the