

ICS 29.240.10
CCS P 62

DL

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

DL/T 5056-2007

**Technical Code of General Plan Design for Substation
(English Translation)**

Issued on: December 3, 2007

Implemented on: June 1, 2008

Issued by: National Development and Reform Commission

Table of Contents

Foreword...	3
1 Scope...	6
2 Normative References...	7
3 General Principles...	8
4 General Planning...	9
5 General Plane Layout...	11
6 Vertical Layout...	18
7 Underground Pipeline (trough) Layout...	28
8 Roads...	35
9 Treatment and Afforestation of Outdoor Power Distribution Unit Site.....	39
10 Technical and Economic Indicators.....	41

1 Scope

This Standard stipulates the basic technical requirements of general plan design for substations.

This Standard is applicable to the general plan design for newly constructed or expanded substations with the voltage level of 110 kV ~ 750 kV. The general plan design for substations with the voltage level of above 750 kV, reconstructed substations and converter stations may also take this as a reference.

2 Normative References

Through the reference in this Standard, clauses in the following documents become clauses of this Standard. In terms of references with a specific date, all the subsequent modification orders (excluding the corrected content) or revised editions are not applicable to this Standard. However, all parties that reach an agreement in accordance with this Standard are encouraged to explore the possibility of adopting the latest versions of these documents. In terms of references without a specific date, the latest versions are applicable to this Standard.

GB 50007 Code for Design of Building Foundation

GB 50016 Code for Fire Protection Design of Buildings

GB 50187 Code for Design of General Layout of Industrial Enterprises

GB 50201 Standard for Flood Control

GB 50229 Code for Design of Fire Protection for Fossil Fuel Power Plants and Substations

GB 50330 Technical Code for Building Slope Engineering

GBJ 22 Specifications for the Design of Factory and Mine Roads

DL/T 5032 Technical Code of General Plan Transportation Design for Fossil Fuel Power Plants

3 General Principles

3.0.1

The general plan design for substations must comprehensively implement the nation's fundamental construction policies; reflect the nation's technical and economic policies; unify and clarify construction standards; guarantee that newly constructed (expanded) substations are safe, reliable, technologically advanced, affordable and consistent with the national conditions.

3.0.2

The general plan design for substations must establish an overall viewpoint; conduct in-depth investigation and survey; rely on technological progress; design meticulously; continuously summarize experience; energetically and deliberately promote domestic and foreign advanced technologies; adapt measures to local conditions and adopt mature new materials, processes and plans; satisfy the requirements of sustainable development.

3.0.3

The general plan design for substations shall comply with relevant stipulations of Land Administration Law of the People's Republic of China; comply with the nation's land utilization policies; adapt measures to local conditions; implement land conservation and reasonable land utilization; enhance land utilization rate; make the most of wastelands, badlands and sloping lands; refuse to occupy, or, occupy very little farmlands. Furthermore, the general plan design for substations shall reasonably utilize landforms, decrease site leveling soil (stone) quantity and demolition of the existing facilities and constructions (structures); avoid or reduce land acquisition on behalf of others. Through the techno-economic comparison of multiple plans, optimize design plans; reduce construction costs; shorten construction periods; create conditions for civilized construction.

3.0.4

This Standard was formulated in accordance with the principles of GB 50187

Code for Design of General Layout of Industrial Enterprises. Except from the execution of this Standard, the general plan design for substations constructed under special natural conditions, such as mountainous areas, earthquake areas, collapsible loess areas, expansive soil areas, soft soil areas, permafrost areas and salinized soil areas, shall still comply with the relevant stipulations in the existing national standards and industry standards.

3.0.5

The general plan design for expanded and reconstructed substations shall combine the characteristics of the previous general plane layout, vertical plan and equipment setting, so as to reach coordinative unity of the integrity.

4 General Planning

4.0.1

The general planning for substations shall coordinate with the local town planning, industrial park planning, natural reserve planning or tourism area planning. Substations shall not be located in geological disaster-stricken sections, such as landslide, debris flow, large water-eroded cave and mined-out area. Substations shall not be constructed over mineral products or cultural relics. Avoid mutual interference with military, aviation and communication facilities. Off-site traffic shall satisfy the requirements of the transportation of large-sized equipment. Thoroughly utilize nearby public facilities in livelihood, culture and education, sanitation, traffic, fire protection and water supply and drainage, etc.

In terms of substations in special landforms, for example, mountainous areas, the overall planning shall consider the influence of landforms, stability of mountain massif, slope excavation, flood and waterlogging. Construction of substations in areas affected by torrential flood and waterlogging should thoroughly utilize the existing flood control and waterlogging control facilities in the locality.

4.0.2

The overall planning of urban underground (indoor) substations shall satisfy the requirements of local urban planning; avoid mutual interference with adjacent neighbors, enterprises and facilities.

4.0.3

The overall planning of substations shall base on the requirements of process layout, and the demands for construction, operation, overhauling and ecological environmental protection; combine site location's natural conditions; implement overall planning in accordance with the final scale; combine the short-term and long-term planning, and focus

on the short-term planning. In staged construction, in accordance with the requirements of load development, implement reasonable planning;

expropriate land by stages or at a time.

The overall planning shall base on the above-mentioned principles, make overall arrangements of substation areas, water sources, water supply and drainage facilities, entry roads, flood control and discharge facilities, entry and exit corridors, terminal tower, external power supply and the influence of ambient environment; implement reasonable layout.

4.0.4

When there are pollution sources near substations, the overall planning shall base on the category of pollution sources and the prevailing wind direction throughout the year to prevent adverse influence on the substations.

4.0.5

Substations shall be equipped with reliable water sources. The quality of drinking water shall comply with the national standard on drinking water hygiene. Production waste drainage or raindrops and domestic sewage of the substations shall comply with national or local standards on emission.

5.1 General Regulations

5.1.1

The general plane layout for substations shall comply with the final scale in planning and design. In accordance with the requirements of systematic load development, the possibility of expansion should not be cut down; the general plane layout for substations shall be as structured as possible.

5.1.2

The general plane layout for substations shall satisfy the overall planning requirements; process layout in the substations shall be reasonable. Function division shall be clarified; traffic shall be convenient; land utilization shall be optimal.

5.1.3

The general plane layout for substations shall centralize the recently constructed constructions (structures), so as to facilitate staged construction and land conservation.

The civil engineering of urban underground (indoor) substation construction shall be constructed at a time in accordance with the final scale.

5.1.4

The main production and auxiliary (affiliated) buildings of substations shall be intensively or jointly arranged. When substations are jointly constructed with convertor stations, they may