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

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Replacing GB 50260-1996

Code for seismic design of electrical installations

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1 General

1.0.1 In order to implement the "Law of the People's Republic of China on Earthquake Prevention and Disaster Mitigation", implement the policy of "focusing on prevention and combining defense with rescue", so that after the earthquake-resistant fortification of the power facilities, the earthquake damage to the power facilities can be reduced, casualties can be avoided, and the economic loss, formulate this specification.

1.0.2 This code is applicable to the seismic design of the following power facilities newly built, expanded and reconstructed in areas with seismic fortification intensity of 6 to 9 degrees.

1 Power facilities of thermal power plants with a single unit capacity of 12MW to 1000MW.

2 Relevant electrical facilities of hydroelectric power plants with a unit capacity of 10MW and above.

3 Electric power facilities in AC power transmission and transformation projects with a voltage level of 110kV ~ 750kV.

4 Power facilities in DC power transmission and transformation projects with a voltage level of +/-660kV and below.

5 Power communication microwave tower and its foundation.

1.0.3 Newly built, rebuilt and expanded power facilities must meet the seismic fortification requirements.

1.0.4 The electrical facilities in the power facilities designed according to this code should not be damaged when they are affected by an earthquake equivalent to or below the seismic fortification intensity of the local area; When affected by a rare earthquake with corresponding intensity, it should not be seriously damaged, and it can be restored to use after repair.

1.0.5 When the buildings (structures) of power facilities designed according to this code are affected by frequent earthquakes lower than the local seismic fortification intensity, the main structure can continue to be used without damage or repair; When affected by the fortification earthquake equivalent to the seismic fortification intensity of this area, damage may occur, but it can continue to be used after general repairs or no repairs; when it is affected by rare earthquakes higher than the corresponding seismic fortification intensity of this area, It should not collapse or cause life-threatening serious damage.

1.0.6 Power facilities shall be divided into important power facilities and general power facilities according to their importance and characteristics of earthquake resistance, and shall comply with the following regulations.

1 Those that meet one of the following conditions are important power facilities.

- 1) Thermal power plants with a single unit capacity of 300MW or above or a planned capacity of 800MW or above;
- 2) Self-provided power plants of industrial and mining enterprises where power failure will cause serious damage to important equipment or endanger personal safety;
- 3) Hydroelectric power plants with a design capacity of 750MW and above;
- 4) 220kV hub substation, 330kV~750kV substation, 330kV and above converter station, 500kV~750kV line large-span tower, +/-400kV and above line large-span tower;
- 5) Communication facilities of the power system that cannot be interrupted;
- 6) Approved by the competent ministry (committee), other important power facilities that must ensure normal power supply during an earthquake.

2 Other power facilities except important power facilities are general power facilities.

1.0.7 Buildings (structures) in power facilities are divided into three categories according to their importance, and should meet the following requirements.

1 Among the important power facilities, the main buildings (structures) of the power plant and the power supply buildings (structures) of the power transmission and transformation project are the key fortification category, referred to as Category B for short.

2 The main buildings (structures) of general power facilities, buildings (structures) with continuous production and operation equipment, public buildings (structures) and important material warehouses are standard fortification categories, referred to as Category C.

3 Secondary buildings (structures) other than Category B and C are moderately fortified, referred to as Category D.

1.0.8 The seismic fortification parameters or intensity of electric power facilities must be determined according to the documents (maps) approved and issued by the state.

1.0.9 The seismic fortification intensity or ground motion parameters of power facilities shall be determined according to the relevant provisions of the current national standard "Zoning Map of Seismic Motion Parameters in China" GB 18306. For engineering sites that have been evaluated for seismic safety in accordance with relevant regulations, seismic fortification shall be carried out according to the approved seismic fortification design ground motion parameters or corresponding intensities. The electrical facilities in the important power facilities can be fortified according to the seismic fortification intensity increased by 1 degree, but the seismic fortification intensity is 9 degrees and above will not be increased.

1.0.10 The anti-seismic fortification standards of buildings (structures) of each anti-seismic fortification category shall comply with the relevant provisions of the current national standard GB 50223 "Standards for Seismic Fortification Classification of Construction Engineering".

1.0.11 When the important large-span towers and foundations of overhead power transmission lines need to be fortified by one degree, experts should be organized to review and report to the competent unit for approval.

1.0.12 The anti-seismic design of electrical facilities and buildings (structures) in power facilities shall not only comply with the provisions of this code, but also comply with the relevant current national standards.

2 Terminology and symbols

2.1.1 Seismic precautionary intensity

The seismic intensity approved as the basis for an area's seismic fortification according to the authority stipulated by the state. Under normal circumstances, the seismic intensity is taken to exceed the probability of 10% within 50 years.

2.1.2 venue site

Engineering population locations with similar response spectrum characteristics. Its scope is equivalent to the plane area of the factory area, residential area and natural village or not less than 1.0km².

2.1.3 earthquake action

Structural dynamic action caused by ground motion, including horizontal earthquake action and vertical earthquake action.

2.1.4 Design basic acceleration of ground motion

The seismic acceleration value with a probability of exceeding 10% in the 50-year design reference period is the seismic acceleration value for general construction engineering

seismic design.

2.1.5 design characteristic period of ground motion

In the seismic influence coefficient curve used for seismic design, the period value corresponding to the starting point of the descending section reflecting factors such as earthquake magnitude, epicentral distance and site type is referred to as the characteristic period.

2.1.6 Seismic measures

Seismic design content other than seismic action calculation and resistance calculation, including seismic structural measures.

2.1.7 details of seismic design

According to the principle of seismic conceptual design, there is generally no need to calculate the various detailed requirements that must be adopted for each part of the structure and non-structure.

2.1.8 Natural frequency natural frequency

The frequency of free vibration depends only on the physical properties of the structure itself (mass, stiffness and damping).

2.1.9 time history curve time history curve

The relationship curves of physical quantities such as acceleration, velocity, and displacement with time are called acceleration, velocity, and displacement time-history curves, respectively.

2.1.10 sine beat

A continuous sine wave of a certain frequency modulated by a lower frequency sine wave. The duration of a sine beat is half a period of the modulating frequency.

2.2.1 Function and effect.

F_{ji} --the standard value of horizontal seismic action of j mode type i particle;

F_{EK} --standard value of the total horizontal seismic action of the structure;

F_i --standard value of horizontal seismic action of particle i ;

F_n --additional horizontal seismic action on the top;

G_i , G_j --respectively represent the gravity load concentrated on the mass point i , j ;