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**Code for seismic design of mechanical and electrical
equipment
(English Translation)**

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1 General

1.0.1

In order to implement the "Construction Law of the People's Republic of China" and the "Law of the People's Republic of China on Earthquake Prevention and Disaster Mitigation", the principle of "prevention first" is implemented, and the building's water supply and drainage, heating, ventilation, air conditioning, gas, heat, electricity, This specification is formulated for communication, fire protection and other mechanical and electrical projects, after seismic fortification, to reduce earthquake damage, prevent secondary disasters, avoid casualties, reduce economic losses, and achieve safety, reliability, advanced technology, reasonable economy, and convenient maintenance and management.

1.0.2

This specification is applicable to the seismic design of building electromechanical engineering with seismic fortification intensity of 6 to 9 degrees, and not applicable to the seismic design of building electromechanical engineering with seismic fortification intensity greater than 9 degrees or with special requirements.

1.0.3

The seismic design of building mechanical and electrical engineering facilities according to this specification shall meet the following requirements.

1 When subjected to frequent earthquakes that are lower than the seismic fortification intensity of the local area, the mechanical and electrical engineering facilities are generally not damaged or can continue to operate without repairs;

2 When affected by an earthquake equivalent to the seismic fortification intensity of this

area, the mechanical and electrical engineering facilities may be damaged and can continue to operate after general repairs or without repairs;

3 When affected by a rare earthquake that is higher than the seismic fortification intensity in this area, the mechanical and electrical engineering facilities will not be severely damaged and life-threatening.

1.0.4

Seismic design must be carried out for mechanical and electrical engineering of buildings in areas with seismic fortification intensity of 6 degrees and above

1.0.5

For the mechanical and electrical engineering of buildings located in areas with seismic fortification intensity of 6 degrees and other than Class A buildings, earthquake action calculations may not be performed.

Note: In the following articles of this code, the expression "seismic fortification intensity" is generally omitted, and "seismic fortification intensity is 6 degrees, 7 degrees, 8 degrees, 9 degrees" is referred to as "6 degrees, 7 degrees, 8 degrees, 9 degrees".

1.0.6

The seismic design of building mechanical and electrical engineering shall not only comply with this code, but also comply with the current relevant national standards.

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. In general, the seismic intensity is taken to exceed the probability of 10% within 50 years.

2.1.2 Seismic precautionary criterion

The scale to measure the level of seismic fortification requirements is determined by the seismic fortification intensity or design ground motion parameters and the building's seismic fortification category.

2.1.3 Earthquake action

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

2.1.4 Building mechanical and electrical equipment engineering facilities

Ancillary machinery, electrical components, and systems that serve building functions. It mainly includes elevators, lighting systems and emergency power supplies, communication

equipment, piping systems, heating and air conditioning systems, fire alarm and fire fighting systems, shared antennas, etc.

2.1.5 Seismic support

A member consisting of anchors, reinforced suspenders, diagonal braces and seismic connection members.

2.1.6 Seismic bracing

It is an anti-seismic support facility that is firmly connected with the building structure and takes earthquake force as the main load. It consists of anchors, reinforced suspenders, anti-seismic connecting members and anti-seismic braces.

2.1.7 Lateral seismic bracing

An anti-seismic hanger with diagonal braces parallel to the cross-section of the pipe.

2.1.8 Longitudinal seismic bracing

The anti-seismic support and hanger with diagonal braces perpendicular to the cross section of the pipe.

2.1.9 Single tube seismic bracing

An anti-seismic support and hanger composed of a load-bearing hanger and anti-seismic diagonal braces.

2.1.10 Door-shaped seismic bracing

An anti-seismic support and hanger composed of two or more load-bearing hangers, beams, and anti-seismic diagonal braces.

2.1.11 Design basic acceleration of ground motion

The design value of the seismic acceleration with a probability of exceeding 10% in the 50-year design base period.

2.1.12 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 reflects factors such as earthquake magnitude, epicentral distance and site type.

2.2.1 Actions and action effects

F-the standard value of horizontal seismic action applied at the center of gravity of the mechanical and electrical engineering facilities along the most unfavorable direction;

G-gravity of non-structural components;

SGE - the effect of the representative value of the gravity load;

SEhk-the effect of the standard value of horizontal seismic action;

S--Design value of internal force combination of mechanical and electrical engineering facilities or components.

2.2.2 Resistance and material properties

R-design value of member bearing capacity;

[thetae] - limit value of displacement angle between elastic layers;

betas--floor response spectrum value of building mechanical and electrical engineering facilities or components.

2.2.3 Geometric parameters

h-calculated floor height;

l-the lateral and longitudinal seismic support hanger spacing of the horizontal pipeline;

l0--The maximum spacing of seismic supports and hangers;

L--the distance from the next longitudinal seismic support and hanger;

L1--longitudinal seismic support hanger spacing;

L2-Space of lateral seismic supports and hangers.

2.2.4 Calculation coefficients

gamma--function coefficient of non-structural component;

eta-coefficient of category of non-structural components;

xi1--state coefficient;

xi2--Position coefficient;

alphamax--maximum value of seismic influence coefficient;

gammaG-subitem coefficient of gravity load;

gammaEh-sub-item coefficient of horizontal earthquake action;