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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 50061-2010

Replacing GB 50061-97

Standard for design of 66kV or under overhead electrical power transmission line

66kV及以下架空电力线路设计标准

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1 General provisions

1.0.1 The document states that it was drawn up so that the design of overhead power lines of 66 kV and below gives a safe and reliable supply, is technically advanced and

economically reasonable, is convenient for construction, inspection and maintenance, and favours environmental protection and the integrated use of resources.

1.0.2 It applies to the design of alternating current overhead power lines of 66 kV and below, called overhead power lines in the rest of the document.

1.0.3 The design of overhead power lines is to carry out the technical and economic policy of the state, to meet the requirements of the development plans, and to take up mature and reliable new techniques, new materials, new equipment and new processes.

1.0.4 The structural design of the towers of an overhead power line is to use the limit state design method based on probability theory.

1.0.5 The document lays down the basic technical requirements for the design of overhead power lines of 66 kV and below; where it conflicts with a national law or administrative regulation, the law or the regulation is to be followed.

1.0.6 Besides this document, the design of overhead power lines is to comply with the relevant current national standards.

2 Terms

2.0.1 The clause is marked in the printed text as deleted.

2.0.2 overhead power line - a power line whose conductors are strung above the ground on insulating components and on supports such as poles and towers.

2.0.3 The clause is marked in the printed text as deleted.

2.0.4 conductor - a single-strand wire, or a stranded wire made of several strands not insulated from one another, that carries current.

2.0.5 overhead ground wire - a wire earthed at some or all of the towers, usually hung above the line conductors, forming a protective angle over them and preventing lightning strikes on the conductors and the insulators.

2.0.6 span - the horizontal distance between the suspension points of the conductor on two adjacent towers.

2.0.7 sag - within one span of an overhead line, the greatest vertical distance between the conductor and the straight line joining its suspension points.

2.0.7A reference wind speed - the wind speed determined from the observed 10-minute mean maximum wind speed at a height of 10 m over open flat ground at the place, after a probability analysis giving the 30-year maximum value.

2.0.7B everyday tension - the tension of the conductor or of the overhead ground wire at the lowest point of the sag under the annual mean air temperature.

2.0.8 creepage distance - the shortest distance, or the sum of the shortest distances, along the surface of the insulating part between the two parts of an insulator that normally carry the operating voltage.

2.0.9 mechanical failing load - the load defined under the specified test conditions, in which the elements of an insulator string are to withstand independently the load applied to the metal fittings. The definition continues on a page that is not among the extracted images.

3 Route

3.0.1 The choice of the route of an overhead power line is to be based on careful investigation, is to take account of operation, construction, transport conditions and route length together, is to be arranged as a whole, and is to be settled by comparing several schemes so that the result is economically reasonable and safe and suitable.

3.0.2 The route of an overhead power line in an urban area is to be combined with the urban master plan, and the position of the route corridor is to be arranged together with the various pipelines and the other municipal facilities.

3.0.3 The clause lists the rules for the choice of the route. Item 1 is marked as deleted. Item 2 requires the classification of overhead telecommunication lines to follow Appendix A of the document. The added item 2A says that an overhead power line should keep clear of low-lying land, scoured belts, areas of poor ground, primeval forest, areas prone to conductor galloping, and other areas that affect the safe operation of the line. The added item 2B requires crossings with other facilities to be reduced, and says that where the line crosses another overhead line the crossing point should not be chosen at the top of a tower of the line being crossed. Item 3 requires the crossing angle at which an overhead power line crosses an overhead telecommunication line to meet Table 3.0.3, which gives one minimum crossing angle for grade one telecommunication lines, a smaller one for grade two, and no limit for grade three. Item 4 forbids overhead power lines of 3 kV to 66 kV to cross the area of a warehouse storing flammable or explosive goods, and requires the fire separation distance between an overhead power line and category A production buildings and warehouses, stockyards of flammable or explosive materials and tanks of combustible, flammable or explosive liquid or gas to follow the relevant provisions of the current national standard GB 50016 on fire protection design of buildings. Items 5 and 6 are marked as deleted. Item 7 concerns the relationship of an overhead power line with category A and category B production buildings and warehouses and with stacks of combustible material; its text continues on a page that is not among the extracted images.

4 Meteorological conditions

4.0.1 The meteorological conditions used in the design of an overhead power line are to be settled from the meteorological data along the route and from the operating experience of

nearby existing lines, and are to be determined from the statistical values of the local meteorological records of the last 15 to 30 years; the return period of the design meteorological conditions should be taken as 30 years.

4.0.2 The annual mean air temperature used in design is to be determined as follows: where the annual mean air temperature of the area lies between 3 and 17 degrees Celsius, the value is to be taken as the nearest multiple of 5; where it is below 3 or above 17 degrees Celsius, it is to be reduced by 3 to 5 degrees Celsius and then taken as the nearest multiple of 5.

4.0.3 The ice thickness on the conductor or the overhead ground wire used in design may be taken, on the basis of the survey, as 5, 10, 15 or 20 mm; the density of the ice is to be taken as 0.9 g per cubic centimetre; the air temperature under icing is to be taken as minus 5 degrees Celsius and the wind speed should be taken as 10 m per second.

4.0.4 The wind speed for the installation condition is to be taken as 10 m per second, with no ice. The air temperature is fixed by area: minus 15 degrees Celsius where the lowest air temperature is minus 40; minus 10 where it is minus 20; minus 5 where it is minus 10; 0 where it is minus 5; and the lowest air temperature itself where that is 0 degrees Celsius or above.

4.0.5 The air temperature for the lightning overvoltage condition may be taken as 15 degrees Celsius. Where the reference wind speed converted to the mean height of the conductor is 35 m per second or more, the wind speed for the lightning overvoltage condition may be taken as 15 m per second; where it is below 35 m per second, 10 m per second may be taken.

4.0.6 The highest air temperature used in the design of an overhead power line should be taken as plus 40 degrees Celsius. Under the highest air temperature condition, the lowest air temperature condition and the annual mean air temperature condition, the calculation is to assume no wind and no ice; the rest of the clause falls on a page that is not among the extracted images.

Note on the title change made by the 2025 partial revision Change of title, number unchanged

Announcement No. 5 of 2025 of the Ministry of Housing and Urban-Rural Development, dated 10 January 2025 and reproduced in the volume, approves the partially revised provisions of the national standard GB 50061-2010 and puts them into force from 1 May 2025. The same announcement changes the title of the standard from Code for design of 66 kV or under overhead electrical power transmission line to Standard for design of 66 kV or under overhead electrical power transmission line.

The number of the standard is not changed: the cover of the volume examined still carries