ICS 27.100
P 62
Record No. J432—2005

DL

Electric Power Industry Standard of the People's Republic of China

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DL / T 5220 — 2005

Supersede SDJ 206 — 1987

Code for Designing Over-head Distribution Transmission Line up to 10kV

Issue Date: February 14, 2005 Implementation Date: June 1, 2005

Issued by the National Development and Reform Commission of the People's Republic of China

图书在版编目（CIP）数据

DL/T 5220—2005 10kV以下架空配电线路设计技术规程：替代SDJ206—1987：英文 / 中华人民共和国国家发展和改革委员会发布. —北京：中国电力出版社，2012.3

ISBN 978-7-5123-2779-5

Ⅰ. ①D… Ⅱ. ①中… Ⅲ. ①架空线路：输电线路–设计规范–中国–英文 Ⅳ. ①TM726.3-65

中国版本图书馆CIP数据核字（2012）第036862号

中国电力出版社出版、发行

（北京市东城区北京站西街19号 100005 http://www.cepp.sgcc.com.cn）

北京博图彩色印刷有限公司印刷

各地新华书店经售

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2012年4月第一版 2012年4月北京第一次印刷

850毫米×1168毫米 32开本 1.875印张 45千字

Contents

Foreword

The code is revised from SDJ 206—1987 *Code for Designing Overhead Distribution Line* issued by the former Ministry of Water Conservancy and Electric Power in January 1987, according to the *Notice concerning Release of the Development & Revision Plan of Electric Power Industry Standard* in 2000 (GJMDL [2000] No.70) issued by the former State Economic and Trade Commission.

As compared with the original version, the following major revisions are made in this code:

(1) The code is specific to the design of overhead electric power lines at 10kV and below so as to meet the power supply demand in urban and rural areas.

(2) To meet the growing requirements on reliability of power supply and energy quality in urban network, since 1990, insulated overhead conductors have been gradually applied for distribution lines in large-and middle-sized cities in China. Therefore, the information regarding the design of insulated overhead conductors at 10kV and below is supplemented in this revision.

(3) Supplemental contents on line crossing has been included in the revision. Additionally, typical meteorological regions are incorporated herein.

(4) The sections and articles in the original code that are not applicable to the current production requirements are either deleted or modified.

This code upon its issuance will supersede SDJ 206—1987.

Appendix A, Appendix B, Appendix C and Appendix D to this code are normative.

This code is proposed by China Electricity Council.

This code is solely managed and interpreted by Technical Committee on Electric Power Planning and Engineering of Standardization Administration of Power Industry.

This code is drafted by Tianjin Electric Power Design Institute.

The participants in the development of this code also include Beijing Power Supply Design Institute, Wuhan Power Supply Design Institute and Nanjing Electric Power Design and Research Institute.

The leading authors of this code: Li Shisen, Cheng Jingchun, Xu Baoyi, Liu Yinchu, Wang Xiuyan, Liu Gang and Wang Xuelun.

This code is translated by SUNTHER Translation & Solutions under the authority of China Electric Power Planning & Engineering Association.

1 Scope

1.0.1 This code specifies the design principles for the AC overhead distribution line at 10kV and below (hereinafter referred to as “distribution line/lines”).

1.0.2 This code is applicable to the design of AC overhead distribution lines at 10kV and below.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute the provisions of this code. For dated references, subsequent amendments (excluding the contents of errata) to, or revision of, any of these publications do not apply. However, parties to agreements based on this code are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition thereof applies to this code.

GB/T 1179 *Round Wire Concentric Lay Overhead Electrical Stranded Conductors*

GB 12527 *Aerial Insulated Cables for Rated Voltages up to and Including 1kV*

GB 14049 *Aerial Insulated Cables for Rated Voltage of 10kV and 35kV*

GB/T 16434 *Environmental Pollution Classification and External Insulation Selection for High Voltage Transmission Line, Power Plant and Substation*

GB 50060 *Code for Design of High Voltage Electrical Installation (3kV–110kV)*

GB 50061 *Code for Design of 66kV or Below Overhead Electrical Power Transmission Line*

DL/T 765.1 *Technical Requirements for Distribution Fittings*

DL/T 5092 *Technical Code for Designing 110kV–500kV*

Overhead Transmission Line

DL/T 5130 *Technical Regulation for Design of Steel Transmission Pole*

JTJ 001 *Technical Standard of Highway Engineering*

3 Terms and Symbols

3.1 Terms

3.1.1

Everyday Tension

The calculated tension at the lowest point of the sag of conductors at the annual average temperature.

3.1.2

Reinforced Concrete Pole

A general name for common reinforced concrete poles, partially pre-stressed concrete poles and pre-stressed reinforced concrete poles.

3.1.3

Residential Area

Densely populated areas such as urban areas, industrial areas, ports, wharfs and bus and railway stations.

3.1.4

Nonresidential Area

Areas other than the residential area defined above. Nonresidential areas also include the areas with frequent access of people, vehicles or agricultural machinery, but having few or even none of houses.

3.1.5

Difficult Transport Area

Areas not accessible for vehicles and agricultural machinery.

3.1.6

Large Span

A span within tension sections of a distribution line crossing wide navigable rivers, lakes or valleys, which exceeds the normal range, and, thus requires the special design of conductor type and structure and is extremely difficult to repair in the event of faults.

3.2 Symbols

W_x—characteristic value of conductor wind load, kN;

W_0—characteristic value of reference wind pressure, kN/m^2;

μ_s —shape coefficient of wind load;

μ_z—coefficient of wind pressure change as a function of elevation;

β —wind fluttering factor;

a —span factor of wind load;

L_w—wind span, m.

4 General

4.0.1 The design of distribution lines must be in compliance with the national construction strategy and technical and economic policies and be safe, reliable, economic and applicable.

4.0.2 The design of distribution lines must be based on the practical conditions with due consideration of regional characteristics. New materials, processes, technologies and equipment shall be actively and prudently employed.

4.0.3 The conductor layout and tower structure of trunk distribution lines shall be designed to allow for live line work.

4.0.4 Large spans of distribution lines shall be designed according to DL/T 5092.

4.0.5 In addition to this code, relevant provisions of current national standards and electric power industry standards shall also be observed during the design of distribution lines.

5 Routing

5.0.1 In selecting the route of distribution lines, careful investigations and studies are required taking into account factors such as operation, construction, traffic conditions and length of route in a comprehensive and systematic manner so as to ensure the safety, applicability and cost effectiveness.

5.0.2 The distribution lines shall be routed to accommodate the overall planning of urban area and be harmonious with the layout of various pipelines and other utilities. The structures shall be located to match the landscape of urban areas.

5.0.3 The line routing and structure locations shall be kept clear of low-laying lands, areas vulnerable to frequent scouring and other areas where the safe operation of lines is affected.

5.0.4 The distribution lines in rural areas shall be routed in harmony with roads, rivers and irrigation channels to minimize and avoid the occupation of arable land.

5.0.5 Distribution lines shall be kept clear of warehouse areas for flammables and explosives. It shall be ensured that a fire separation distance equal to 1.5 times the structure height is provided between distribution lines and the manufacturing factories and warehouses with fire risks, stockyards for flammable and explosive materials and tanks for flammable and explosive liquid or gas.

6 Meteorological Conditions

6.0.1 The meteorological conditions as a basis for designing distribution lines shall be determined according to the meteorological information of local areas and the operating experiences from the existing lines nearby. If the meteorological conditions of local area are similar to those as specified for typical meteorological area in Appendix A, the data for the latter should be used.

6.0.2 The maximum design wind velocity of distribution lines shall be the mean maximum wind velocity in 10 minutes at 10-year recurrence period at 10 m height above the ground. If no reliable data is available, the selected maximum design wind velocity shall not be less than 25m/s in flat and open areas, and should be 1.1 times the wind velocity of nearby flat areas and shall not be less than 25m/s in mountainous regions.

6.0.3 For distribution lines running through urban areas or forests, the maximum design wind velocity should be 20% lower than that of the local area if the shields at either side of the lines have an average height larger than 2/3 of the structure.

6.0.4 For distribution lines routed around high-rise buildings in cities, the wind velocity designed for windward areas shall be appropriately increased with respect to other areas. Where no reliable data is available, it shall be 20% higher than that of the flat land nearby.

6.0.5 The annual average temperature for designing distribution lines shall be determined by using the following methods:

(1) Where the annual average temperature is between 3℃ and

17℃, the multiple of five closest to the actual annual average temperature shall be taken.

(2) Where the actual annual average temperature is lower than 3℃ or higher than 17℃, the multiple of 5 closest to the value obtained by subtracting a value in the range of 3℃ to 5℃ from the actual annual average temperature shall be taken.

6.0.6 The design icing thickness of conductors of distribution lines shall be determined based on the operating experience of the existing lines nearby and should be the multiples of 5mm.

7 Conductors

7.0.1 Distribution lines shall employ stranded conductors whose technical performance shall comply with the requirements of GB/T 1179, GB 14049 and GB 12527.

7.0.2 Aluminum conductor Steel-reinforced (ACSR) and other composite conductors shall be calculated according to the maximum operating tension or everyday tension.

7.0.3 Where wind direction is perpendicular to lines, the characteristic value of conductor wind load shall be calculated from:

$$W_X = \alpha \mu_s d L_w W_0 \qquad (7.0.3)$$

Where:

W_X—the characteristic value of conductor wind load, kN;

α—the span factor of wind load as per Article 10.0.7 of this code;

μ_s—the shape factor of wind load, which is 1.2 if $d < 17$mm, 1.1if $d \geqslant 17$mm and 1.2 if there occurs icing;

d—the calculated outside diameter of conductors when coated with ice, m;

L_w—the wind span, m;

W_0—the characteristic value of reference wind pressure, kN/m^2.

7.0.4 In urban areas, overhead insulated conductors shall be used for distribution lines erected in the following areas:

1 Areas where the line corridors are confined;

2 Areas neighboring high-rise buildings;

3 Bustling streets or densely-populated regions;

4 Tourism or green areas;

5 Areas where ambient air is heavily polluted;

6 Building construction sites.

7.0.5 The design safety coefficient of conductors shall not be lower than the values listed in Table 7.0.5 below:

Table 7.0.5 Minimum Design Safety Coefficient of Conductors

Type of Insulated Conductors	Ordinary Areas	Important Areas
Aluminum stranded conductors, aluminum conductor steel-reinforced (ACSR), aluminum alloy conductors	2.5	3.0
Copper stranded conductors	2.0	2.5

7.0.6 The cross-sectional area of conductors of distribution lines shall be determined according to the following provisions:

1 Three or four types of conductors should be used for each area, taking into account the development planning of local power distribution network. The cross-sectional area of conductors should not be less than the values given in Table 7.0.6 for the areas without such planning.

Table 7.0.6 Cross-sectional Area of Conductors mm^2

Type of Conductors	Distribution Lines at 1kV–10kV			Distribution Lines below 1 kV		
	Main Trunks	Sub-trunks	Branches	Main Trunks	Sub-trunks	Branches
Aluminum stranded conductors and aluminum alloy conductors	120 (125)	70 (63)	50 (40)	95 (100)	70 (63)	50 (40)
Aluminum conductor steel-reinforced	120 (125)	70 (63)	50 (40)	95 (100)	70 (63)	50 (40)
Copper stranded conductors	—	—	16	50	35	16

Table 7.0.6 (continued)

Type of Conductors	Distribution Lines at 1kV–10kV			Distribution Lines below 1 kV		
	Main Trunks	Sub-trunks	Branches	Main Trunks	Sub-trunks	Branches
Insulated aluminum stranded conductors	150	95	50	95	70	50
Insulated copper stranded conductors	—	—	—	70	50	35
Note: The values in brackets are applicable for round concentric-lay stranded conductors (refer to GB/T 1179).						

2 Checking in terms of permissible voltage drop:

1) For distribution lines at 1kV–10kV, the maximum voltage drop from the outlet of the secondary side of the feeding substation to the inlet of the primary side of the transformer or receiving substation at the terminal end of the line shall be 5% of the rated voltage at the secondary side of the feeding substation.

2) For distribution lines below 1kV, the permissible voltage drop from the outlet of the secondary side of distribution transformer to the terminal end of the line (excluding service mains) shall be 4% of the rated voltage.

7.0.7 When checking the ampacity of conductors, the permissible temperature of bare conductors, poly-ethylene (PE) insulated conductors and poly-vinyl chloride (PVC) insulated conductors shall be +70℃, while that of cross-linked polyethylene (XLPE) insulated conductors shall be+90℃.

7.0.8 In a three-phase four-wire system below 1kV, the cross-sectional area of the neutral line shall be the same as that of the phase lines.

7.0.9 The connection of conductors shall be made in accordance with the following provisions:

1 The connection of conductors of dissimilar metallic materials, sizes or stranding directions within a span is prohibited.

2 There shall be no more than one connection per conductor within one span.

3 The distance between the connection and the attachment point of the conductor within a span shall not be less than 0.5m.

4 The connection of aluminum conductor steel-reinforced (ACSR) or aluminum stranded conductors within a span should be made by means of mechanical clamping.

5 The connection of copper stranded conductors in a span should be made by means of plugging or mechanical clamping.

6 The jumper connection between copper stranded conductor and aluminum stranded conductor should be made with Cu-Al transition clamps and Cu-Al transition wires.

7 The jumper connection between copper stranded conductor and aluminum stranded conductor should be made with clamps and by means of clamping.

7.0.10 The resistance at the conductor connection shall not be higher than that of conductors of equal length. The mechanical strength of the connection within a span shall not be less than 95% of calculated tensile strength of conductors.

7.0.11 The sag of conductors shall be determined through calculation. The effects of creep resulting from conductor erection on the sag should be compensated through reducing the sag by a percentage as follows:

1 20% for aluminum stranded conductors and aluminum cored insulated conductors;

2 12％ for aluminum conductor steel-reinforced;

3 7％–8％ for copper stranded conductors and copper cored insulated wires.

7.0.12 The aluminum stranded conductors and aluminum conductor steel-reinforced of distribution lines shall be wrapped with aluminum armor tapes at locations where they come into contact with insulators and fittings.

8 Insulators and Fittings

8.0.1 The performance of insulators in distribution lines shall be as specified in the current national standards with respect to insulators used on various structures, and shall satisfy the following provisions:

1 For distribution lines at 1kV–10kV:

1) Pin insulators or porcelain cross-arms shall be used for suspension structures.

2) Insulator strings consisting of two suspension insulators or consisting of one suspension insulator and one butterfly insulator should be employed for tension structures.

3) Organic composite insulators may be used based on the local operating experience.

2 For distribution lines below 1kV:

1) LV pin insulators should be used for suspension structures.

2) A suspension insulator or butterfly insulator shall be used for tension structures.

8.0.2 In air-polluted areas, the electrical porcelain external insulation of distribution lines shall consider an appropriate creepage distance and the use of other anti-pollution measures based on the local operating experience and the local external insulation pollution classes. In case of absence of operating experience, the values in Appendix B shall be observed.

8.0.3 The mechanical strength of insulators and fittings shall be checked with the following Equation (8.0.3):

$$KF<F_u \tag{8.0.3}$$

Where:

K—safety coefficient of mechanical strength, which may be selected from Table 8.0.4;

F—design load, kN;

F_u—electromechanical failing load of suspension insulators, bending failing load of pin insulators and porcelain cross-arm insulators, or the failing load of butterfly insulators and fittings, kN.

8.0.4 The installation of insulators and fittings should be designed by using safety coefficient design method. The safety coefficient of the mechanical strength of insulators and fittings shall be as specified in Table 8.0.4:

Table 8.0.4 Safety Coefficient of Mechanical Strength of Insulators and Fittings

Type	Safety Coefficient	
	Operating Condition	Line-breakage Condition
Suspension insulators	2.7	1.8
Pin insulators	2.5	1.5
Butterfly insulators	2.5	1.5
Porcelain cross-arm insulators	3	2
Organic composite insulators	3	2
Fittings	2.5	1.5

8.0.5 The steel fittings used in distribution lines shall be hot dip galvanized in accordance with the technical requirements of DL/T 765.1.

9 Conductor Configuration

9.0.1 The conductors of distribution lines at 1kV−10kV shall be in vertical, horizontal or triangular configuration. The conductors of distribution lines below 1kV should be arranged horizontally. Distribution lines at 1kV−10kV and below 1kV in suburban areas should be erected on the same structure, clearly marked and shall connect from the same power source.

9.0.2 The conductors of distribution lines below 1kV in the same area shall be arranged on structures in a consistent manner. The neutral line shall be located close to structures or the building. The neutral line in the same circuit shall not be erected higher than live lines.

9.0.3 The street light power lines below 1kV shall not be located at an elevation above other live lines and neutral line on the same structure.

9.0.4 The span of distribution lines should be as shown in Table 9.0.4. The length of a tension section shall not be larger than 1km.

Table 9.0.4 Span of Distribution Lines m

Voltage / Areas	1kV−10kV	Below 1kV
Suburban areas	40-50	40-50
Open areas	60-100	40-60
Note: When insulated bundled conductors are used for lines below 1kV, the span should not be larger than 30m.		

9.0.5 The distribution lines below 1kV erected along buildings and structures shall employ insulated conductors and the interval between adjacent attachment points of conductors should not be more than 15m.

9.0.6 The spacing between conductors of distribution lines shall be determined based on the local operating experience. If no reliable data is available, the spacing between conductors shall not be less than the values listed in Table 9.0.6.

Table 9.0.6 Minimum Spacing of Conductors of Distribution Lines

m

Line Voltage \ Span	40 and below	50	60	70	80	90	100
1kV–10kV	0.6 (0.4)	0.65 (0.5)	0.7	0.75	0.85	0.9	1.0
Below 1kV	0.3 (0.3)	0.4 (0.4)	0.45	—	—	—	—
Note: The values in brackets are applicable for insulated conductors. As for distribution lines below 1kV, the horizontal distance between the two conductors which are located at the opposite sides of the structure and closest to it shall not be less than 0.5m.							

9.0.7 For double-circuit lines at the same voltage level erected on the same structure, or lines at 1kV–10kV and below 1kV erected on the same structure, the vertical distance between cross-arms shall not be less than the values listed in Table 9.0.7.

Table 9.0.7 Minimum Vertical Distance between Cross-arms of Lines Erected on the Same Structure m

Line Voltage \ Type of Structures	Suspension Structures	Sub-supports and Angle Structures
10kV lines and 10kV lines	0.80	0.45/0.60 (see note)
Lines at 10kV and below 1kV	1.20	1.00
Lines below 1kV and lines below 1kV	0.60	0.30
Note: For branch lines on single-circuit branching towers, the distance between the cross-arm of branch lines and that of trunk lines is 0.6m; if the branch lines are on double-circuit branching towers, the cross-arm of branch lines is 0.45m apart from the upper cross-arm of trunk lines and 0.6m from the lower cross-arm of trunk lines.		

9.0.8 For double-circuit insulated lines at the same voltage level that are erected on the same structure, or insulated lines at 1kV–10kV and those below 1kV erected on the same structure, the vertical distance between cross-arms shall not be less than the values listed in Table 9.0.8.

Table 9.0.8 Minimum Vertical Distance between Cross-arms of Lines Erected on the Same Structure m

Type of Structures / Line Voltage	Suspension Structures	Sub-supports and Angle Structures
10kV lines and 10kV lines	0.5	0.5
Lines at 10kV and below 1kV	1.0	—
Lines below 1kV and lines below 1kV	0.3	0.3

9.0.9 When distribution lines at 1kV–10kV and lines at 35kV are erected on the same structure, the vertical distance between conductors of the two classes of distribution lines shall not be less than 2.0m. When distribution lines at 1kV–10kV and 66kV lines are erected on the same structure, the vertical distance between conductors of the two classes of lines should not be less than 3.5m; and when insulated conductors are employed for distribution lines at 1kV–10kV, the said vertical distance shall not be less than 3.0m.

9.0.10 For distribution lines at 1kV–10kV, the cross-sectional areas of the conductors erected on the same cross-arm should not differ by more than three levels.

9.0.11 The clearance from the jumping lines, downleads on one phase to the jumping lines, downleads of the adjacent phases, and the clearance from the jumping lines, downleads of one phase to the conductors of the adjacent phases shall not be less than:

1 0.3m for lines at 1kV−10kV;

2 0.15m for lines below 1kV;

3 The distance from the downleads of lines at 1kV−10kV to the conductors of distribution lines below 1kV shall not be less than 0.2m.

9.0.12 The clearance between the individual conductors and guys, poles or structures shall not be less than:

1 0.2m for lines at 1kV−10kV;

2 0.1m for lines below 1kV.

10 Structures, Guys and Foundations

10.0.1 Load design values shall be used to calculate the bearing capacity (strength and stability) of the structural members and connections thereof on towers. Load characteristic values shall be used to calculate deformation, anti-cracking, cracking and stability of ground bases and foundations.

10.0.2 The design expressions of bearing capacity of tower structural members under limit condition shall be as given in GB 50061. Also, the design expressions used to calculate deformation, cracks and anti-cracking of tower structural members under limit condition during normal service shall be as given in GB 50061 as well.

Both design values and characteristic values of the strength of profiled steel, concrete and steel bars shall be determined in accordance with GB 50061.

10.0.3 The loads on various types of structures shall be calculated based on the following conditions:

1 Maximum wind velocity, without ice and line breakage;

2 Ice coating, corresponding wind velocity and without line breakage;

3 Minimum ambient temperature, without ice, wind and line breakage (applicable to both angle and terminal structures).

10.0.4 Wind loads applied on various types of structures and conductors shall be calculated based on the following three wind directions:

1 Wind direction is perpendicular to the direction of lines (or,

in case of angle structures, perpendicular to the direction of angular bisector);

2 The angle between the wind direction and the line direction is 60° or 45°;

3 Wind direction is along the line.

10.0.5 With various included angles between the wind direction and line direction, the components of wind loads applied on towers and conductors both perpendicular to and along line direction shall comply with the requirements set forth in GB 50061.

10.0.6 The wind vibration coefficient β shall be determined to be 1.0 in case of a structure height below 30m.

10.0.7 The wind load span coefficient α shall be determined as follows:

1 $\alpha = 1.0$ at a wind velocity below 20m/s;

2 $\alpha = 0.85$ at a wind velocity of 20m/s-29m/s;

3 $\alpha = 0.75$ at a wind velocity of 30m/s-34m/s;

4 $\alpha = 0.7$ at a wind velocity of 35m/s and above.

10.0.8 Proven products shall be used for reinforced concrete poles for routing the distribution lines. Construction of structures shall comply with the requirements set forth in currently applicable national standards.

10.0.9 The cross-arms of distribution lines shall be calculated in terms of strength based on the forces applied thereon and shall be selected to have standard specifications. Steel cross-arms, if used, shall have a size of no less than ∠63mm×∠63mm×6mm. Steel cross-arms and the accessories shall be hot dip galvanized.

10.0.10 Guys shall be erected based on the forces applied on structures. The included angle between the guys and structures should be 45°. This angle may be reduced appropriately if there are topographic constraints, but shall never be less than 30°.

10.0.11 Where horizontal guys cross over roads, the vertical distance from them to the road curb shall not be less than 6m. The inclination angle of guyed poles should be 10°–20°. Where horizontal guys cross over tram lines, the vertical distance from them to the road surface shall not be less than 9m.

10.0.12 The guys shall be made of galvanized stranded steel wires. The cross-sectional area thereof shall be determined based on the forces applied thereon and shall not be less than $25mm^2$.

10.0.13 In open areas, if more than ten suspension poles used for distribution lines are continuously erected, they should be provided with wind resistant guys.

10.0.14 Where reinforced concrete poles are provided with guy insulators, in the event that a guy breaks, the vertical distance from the insulators to ground shall not be less than 2.5m and the guys near the ground shall be provided with protective sleeves.

10.0.15 The diameter of anchor rods shall be determined through calculation and shall not be less than 16mm. Guy rods shall be hot dip galvanized. The guy rods in corrosive areas shall have their diameter increased by 2mm-4mm or provided with other effective corrosion protection measures.

10.0.16 The structure foundations shall be designed based on the local operation experiences, sources of the materials thereof and geological conditions.

10.0.17 The buried depth of the structure shall be determined through calculations. The buried depth of the structures for single-circuit distribution lines should be as shown in Table 10.0.17.

Table 10.0.17 Buried Depth of the Structures for Single-circuit Distribution Lines m

Structure height	8.0	9.0	10.0	12.0	13.0	15.0
Buried depth	1.5	1.6	1.7	1.9	2.0	2.3

10.0.18 Compressive stress applied on underside of the structure foundation as well as uplift and overturning stability of the foundation of multiple-circuit distribution lines shall be checked in accordance with GB 50061.

10.0.19 The concrete intensity of cast-in-situ concrete foundations should not be lower than C15 and that of precast foundations should not be lower than C20.

10.0.20 The batholiths, chucks and anchor of rock material (such as granites) shall have complete structure and hard texture and shall be subject to test and certification.

10.0.21 The steel pole for distribution lines shall be selected based on the local conditions. Type and overturning stability of foundations of steel pipe structures shall comply with the requirements in DL/T 5130.

11 Transformer Stands and Switchgears

11.0.1 Distribution transformer stands shall be arranged at the load center or its vicinity where replacement and maintenance of transformers can be easily performed.

11.0.2 Transformer stands should not be provided for the structures of the following types:

1 Angle and branch structures;

2 Structures on which service conductors or cable terminals are erected;

3 Structures on which line switchgears are installed;

4 Structures erected at road crossings;

5 Structures on which a number of LV service conductors are erected;

6 Structures erected in areas accessible to people or in densely populated areas;

7 Structures in heavily polluted areas.

11.0.3 Structure-mounted transformer stands should be used for the transformers with a capacity of 400kVA and below. Transformers with a capacity above 400kVA should be of indoor type. Where pad-mounted transformers or floor-type transformer stands are used, the intended purpose and surrounding environmental conditions shall be taken into consideration comprehensively.

11.0.4 The vertical distance from the bottom of structure-mounted transformer stands to ground shall not be less than 2.5m. For the live parts thereof, the surrounding environmental conditions shall be taken into consideration comprehensively.