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GB/T 18481–2001

Power quality—Temporary and transient overvoltage

电能质量　暂时过电压和瞬态过电压

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Contents

Foreword

This standard is one of the series of power quality system standards, and currently established and issued series of national standards on power quality system include: GB 12325 – 1990 *Admissible deviation of supply voltage*; GB 12326 – 2000 *Voltage fluctuation and lightning*; GB/T 14549 – 1993 *Harmonics in public supply network*; GB/T 15543 – 1995 *Admissible three-phase voltage unbalance factor* and GB/T 15945 – 1995 *Admissible deviation of frequency deviation for power system*.

This standard is established mainly in accordance with the standards (see quoted standards) such as GB/T 2900.19, GB 156, GB/T 16935.1 and GT/T 16927.1 etc as well as referring to standards such as GB 311.7 and DL/T 620 etc.

This standard aims at stipulating the requirements of power quality relating to temporary and transient overvoltages, corresponding insulation level of electrical equipment and overvoltage protection methods. All detailed provisions relating to this aspect can be found in relevant standards. Therefore, this standard will not replace the issued standards, but will make a brief description of such overvoltage characteristics and relevant issues from the point of power quality. Compared with the overvoltage contents in foreign power quality standards, it is relatively detailed.

National standards quoted in this standard basically are relevant IEC standards adopted, equivalent or non-equivalent in recent years.

Annex A to this standard is a normative annex.

Annex B and C to this standard are informative annex

This standard is proposed and under the jurisdiction of Chinese National Standardization Technical Committee for Voltages, Current Ratings and Frequencies。

The standard was drafted by China Electric Power Research Institute

Main drafters of this standard: Lin Haixue, Tu Shuyang and Zhao Gang

Power quality—Temporary and transient overvoltage

1 Scope

1.1This standard stipulates the temporary and transient overvoltages requirements, insulation level of electrical equipment and overvoltage protection methods as well in AC electric power system which is acting on electrical equipment.

1.2 For any power quality problems relating to overvoltage, it shall be executed according to the provisions of this standard and with reference to relevant professional standards as well as combining with power grid, equipment features and operating environment.

1.3 This standard is not applicable for overvoltages caused by static electricity, touching high voltage system and steady-state wave distortion (harmonic).

2 Normative References

The articles contained in the following documents have become this standard when they are quoted herein. For the dated documents so quoted, the latest editions shall be applicable to this Standard.

GB 156-1993 Standard voltage (neq IEC 60038：1983)

GB311.1-1997 Insulation co-ordination for high voltage transmission and transformation equipment (neq IEC 60071-1：1993)

GB/T 2900.19-1994 Electrotechnical terminology High voltage test technique and insulation co-ordination (neq IEC 60060-1：)

GB/T 16927.1-1997 High-voltage test technique Part One: General test requirements (eqv IEC 60060：1989)

GB/T 16935.1-1997 Insulation coordination for equipment within low-voltage systems Part One: Principles, requirements and tests (idt IEC 60664-1：1992)

3 Terms and definitions

For the purpose of this standard, the following terms and definitions given in GB/T 2900.19 and GB/T 16935.1 apply.

3.1 Overvoltage

Use Um to express three-phase system maximum voltage, if the peak value exceeds that $\sqrt{2/3}$ Um of the system highest phase voltage against earth or the phase voltage against earth or the voltage between phases of any waveforms for the highest same voltage peak value $\sqrt{2}$ Um are respectively phase overvoltage against earth or overvoltage between phases.

Note: System highest voltage refers to the voltage peak value at any time and any point in the system during normal operation of the system (system transient and abnormal voltages excepted).

3.1.1 Temporary overoltage

Oscillating overvoltage which keeps undiminished or undamped (in power frequency or a certain multiple, fraction of it) for a long term at a given mounting point.

3.1.2 transient overvoltage

A kind of overvoltage whose duration is several ms or shorter, and often with heavily damped oscillation or without oscillation It can overlay on the temporary overvoltage

3.1.3 Slow-front overvoltage

Switching overvoltage

A kind of transient overvoltage, which is generally unipolar with a peak time between 20 to 5000 and a half-peak time is less than 20 ms.

3.1.4 Reasonance overvoltage

Temporary overvoltage emerges when resonance arising due to unfavorable combination of inductance and capacitor parameters after some make-break operation or fault break-make, its duration is comparatively long and its waveform has periodicity.

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