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

GB/T 18134.1-2000

Replacing GB/T 18134.1-2000

**High-voltage test techniques - Very-fast-front overvoltage
measurements**

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document replaces GB/T 18134.1-2000 "Extremely Fast Impulse High Voltage Testing Techniques - Part 1: Gas-Insulated Substations with Steep Voltages".

The main technical changes in "Measurement System for Wavefront Overvoltage" compared to GB/T 18134.1-2000, apart from structural adjustments and editorial modifications, are as follows.

as follows.

a) The wording of "range" has been changed, and the limitation on the time parameter range has been removed (see Chapter 1, Chapter 1 of the 2000 edition);

(b) The terms and definitions defined in GB/T 2900.19-2022 and GB/T 2900.20-2016 are added to apply to this document (see section [number]).

Chapter 3);

c) Change "Definitions" to "Terms and Definitions," and incorporate the revised content from

the 2000 edition, adding "Transmission Characteristics" and...

The terms "rise time" and their definitions are in Chapter 3 (Chapter 3, 2000 edition).

d) A chapter on "Characteristics of Ultra-Fast Wavefront Overvoltages" has been added, and relevant content from the 2000 edition has been revised and incorporated (see Chapter 4, 2000).

Versions 4.1, 5.1, and 6.1);

e) The characteristics of the internal ultrafast wavefront overvoltage have been modified, changing the low-frequency range f3 component (0.1MHz~5MHz) to the frequency range f3.

The system operating voltage component (10Hz~55Hz) was added (see 4.2, 4.1 in the 2000 edition);

f) The characteristics of the transient casing voltage were modified, changing the VHF range f1 component (up to 100MHz) to the frequency range f1 component.

The quantity (up to 50MHz) will be adjusted to change the low-frequency range f3 component (0.1MHz~1MHz) to the frequency range f3 component.

(30kHz~1MHz), the amplitude range is modified to 0.01~0.035 times the system's highest operating voltage (see 4.3, 2000 edition).

g) The characteristics of the external ultrafast wavefront overvoltage were modified, changing the low-frequency range f3 component (0.1MHz~5MHz) to the frequency range f3.

The system operating voltage component (10Hz~55Hz) has been added, while the step voltage and very high voltage components have been removed.

The frequency range f1 component (up to 100MHz) was adjusted, and the amplitude range was modified to 1.0 to 2.0 times the system's highest operating voltage (see...).

4.4 (6.1 in the 2000 edition)

h) A chapter on "Measurement System for Ultra-Fast Wavefront Overvoltage" has been added, and relevant content from the 2000 edition has been revised and incorporated (see...).

Chapter 5 (sections 4.2, 4.3, 4.4, 5.2, 5.3, 5.4, 6.2, 6.3, and 6.4 of the 2000 edition).

i) An example of a measurement system for external ultra-fast wavefront overvoltage has been added (see Figures 7-9 in 5.2.1.3);

j) The basic requirements for the measurement system for internal ultra-fast wavefront overvoltage have been increased, with the axial distance between the conversion device and the measured point preferably being 1m.

For requirements within the scope, a new normative reference, GB/T 1985-2023, is added (see 5.2.2.1);

k) The electric field probe scheme in the feasible scheme of the transient casing voltage measurement system has been removed (see 5.3.1 in the 2000 edition);

l) The transfer characteristics of the internal ultrafast wavefront overvoltage measurement system were modified (see 5.3.1, 4.2.3 of the 2000 edition);

m) The transfer characteristics of the measurement system for transient case voltage have been modified (see 5.3.2, 5.2.3 in the 2000 edition);

n) The transfer characteristics of the measurement system for external ultra-fast wavefront overvoltage were modified (see 5.3.3, 6.2.3 of the 2000 edition);

o) The method for determining the transfer characteristics of the measurement system has been changed (see 5.3.4, 4.4.2, 5.4.2 and 6.4.2 in the 2000 edition);

p) The calibration procedure for the internal express wavefront overvoltage measurement system has been modified, and the normative reference GB/T 16927.1 has been added.

And GB/T 16927.2 (see 5.4.1, 4.4.3 of the 2000 edition);

q) The calibration procedure for the transient enclosure voltage measurement system has been modified, and the normative references GB/T 16927.1 and have been added.

GB/T 16927.2 (see 5.4.2, 5.4.3 of the 2000 edition);

r) The calibration procedure for the external express wavefront overvoltage measurement system has been modified, and the normative reference GB/T 16927.1 has been added.

And GB/T 16927.2 (see 5.4.3, 6.4.3 of the 2000 edition);

s) Added "Appendix D (Normative) Method for determining the frequency characteristics of a measurement system based on time-domain characteristics experiment".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of High Voltage Testing Technology and Insulation Coordination (SAC/TC163).

1 Scope

This document describes the characteristics of ultrafast wavefront overvoltages and common measurement methods for ultrafast wavefront overvoltages, and specifies the basic requirements of the measurement system.