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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 36279-2018

Methods for testing self-damping characteristics of overhead conductors

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the redrafting method to modify the IEC 62567.2013 "Test Method for Self-damping Characteristics of Overhead Line Conductors".

This standard has the following changes in structure compared to IEC 62567.2013.

--- Adjust Appendix D of IEC 62567.2013 to Appendix A of this standard.

--- Adjust Appendix C of IEC 62567.2013 to Appendix B of this standard.

--- Adjust Appendix A of IEC 62567.2013 to Appendix C of this standard.

--- Adjust Appendix B of IEC 62567.2013 to Appendix D of this standard.

--- Added Appendix E to adjust Table 2 of IEC 62567.2013 to Appendix E of this standard.

The technical differences between this standard and IEC 62567.2013 and their reasons are as follows, and the terms involved in these differences have been passed on the outer side of the page.

The vertical single line (|) of the blank position is marked.

--- To facilitate the testing of the smaller diameter stranded wire, adjust the distance between the exciter and the fixed end to be 0.6m~1.2m (see 5.4);

--- According to the experience of use, delete the scope of use of the attachment, only indicate its quality requirements (see 5.5.2);

--- According to the usage habits of China and the symbolic provisions of this standard, the unit of phase angle alpha is converted from radians (rad) to angle (deg), migration

The time ts is expressed in milliseconds (ms), and the formula (D.1) in Appendix D of IEC 62567.2013 is modified [see Appendix A].

Formula (A.1)];

--- According to the standard system of China and the symbolic provisions of this standard, the specifications of the stranded wire in Figure B.1 of IEC 62567.2013 are modified.

Rated breaking force and ordinate (see Figure D.1);

--- According to the usage habits of China, revised Figure B.2 of IEC 62567.2013 (see Figure D.2).

This standard has made the following editorial changes.

--- In line with the existing standard system, the name of this standard is changed to "Test method for self-damping characteristics of overhead conductors";

--- Change the example diagram of Figure 2 of IEC 62567.2013 to a schematic diagram;

--- Modified Figure 8 of IEC 62567.2013, and deleted Figures 3 and 9 of IEC 62567.2013.

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

This standard is under the jurisdiction of the National Bare Wire Standardization Technical Committee (SAC/TC422).

This standard was drafted by Shanghai Cable Research Institute Co., Ltd., Shanghai National Cable Testing Center Co., Ltd., China Electric Power Research Institute,

Jiangsu Zhongtian Technology Co., Ltd., Qingdao Han Cable Co., Ltd. and Wuxi Huaneng Cable Co., Ltd. participated in the drafting.

Introduction

The self-damping characteristic is the physical property of the internal power consumption when the wire vibrates. For ordinary stranded wires, its own inelastic effect

(Molecular hysteresis) absorbs a small amount of power, most of which is the fine phase of the overlap between the individual lines when the strand is bent with the vibration waveform.

The friction generated by the movement is consumed.

The self-damping characteristic is the main factor to determine the response of overhead conductors to wind-induced alternating forces, and is an important characteristic parameter of overhead conductors.

Manufacturing companies generally do not provide self-damping parameters for the conductors. Self-damping characteristics need to be obtained through laboratory tests; semi-empirical methods can also be used.

The method is used to estimate the self-damping parameters of traditional stranded wires,

but the results are often inconsistent with the test results. In recent years, there have been a large number of new wire applications

In transmission line engineering, its self-damping characteristics and mechanism of action are often different from traditional stranded wires.

In order to form a unified test method, the IEEE Wire Vibration Working Group and CIGRESC22WG01 have jointly compiled the "wire self-resistance".

The IEEE Test Method Guide published IEEE Std.563-1978 and CIGREElectran ° 62-1979, respectively.

Three test methods are recognized in the above documents and can be divided into two categories. "forced vibration" and "free vibration".

The first type of forced vibration method is the "power (test) method (PT)", which is a guide line that performs resonant motion under the action of an exciter, and

The connection of the exciter measures the total power consumed by the vibration of the wire.

The second type of forced vibration method is the "stationary wave method", more precisely, the "reverse standing wave ratio (test) method" (ISWR), which is the guideline in a large number.

Under adjustable harmonic conditions, the power consumption characteristics of the wire are determined by measuring the amplitude at the antinode and the node within the span.

The free vibration method, the "attenuation (test) method", is a guideline that measures the free motion of a forced vibration when it is subjected to a large number of adjustable harmonics.

The attenuation ratio of the amplitude is used to determine the power consumption characteristics of the wire.

Each laboratory used this guide to perform wire self-damping tests, and the results vary widely. The main reasons are as follows.

---The self-damping test method used is different;

---The conditions of each laboratory end are different (such as rigid fixtures, bending units, etc.);

---The type of connection between the exciter and the wire is different (rigid or flexible), and the position of the power input in the gear is different;

---The state of the wires before the test is different (such as creep, pre-vibration, etc.);

--- The production process of the wires is different.

Test method for self-damping characteristics of overhead conductors

1 Scope

This standard specifies the principle, definition, symbol and unit of the self-damping characteristic test method for overhead conductors, sample requirements, test equipment, and test.

Process, test results and test report.

This standard applies to the indoor test of the self-damping characteristic test of overhead conductors.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2900.51-1998 Electrotechnical terminology overhead line (IEC 60050-466.1990, IDT)

IEEEStd.563-1978 Guide to Conductor Self-damping Tests (Guideonconductorself-dampingmeasurements)

IEEEStd.664-1993 Laboratory single-wire wind-induced vibration damping power consumption characteristics test guide (Guideforlaboratory

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Tors)

3 Terms and definitions

The following terms and definitions as defined in GB/T 2900.51-1998 apply to this document.

3.1

Wire self-damping conductor self-damping

Under the action of tension T, the natural vibration caused by half-wavelength lambda/2, anti-abdominal amplitude Y0 and frequency f is eliminated on the conductor of unit length.

Power consumption Pc.

3.2