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

GB/T 15544.4-2017

**Short-circuit current calculation in three-phase a.c. systems -- Part 4:
Currents during two separate simultaneous line-to-earth short circuits
and partial short-circuit currents flowing through earth**

三相交流系统短路电流计算 第4部分：同时发生两个独立单相接地故障时的电流
以及流过大地电流

(English Translation)

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Table of Contents

Foreword	
1 Scope	
2 Normative references	
3 Terms and definitions	
4 Symbol	
5 At the same time, two independent single-phase to ground short-circuit current	
5.1 Symmetrical short circuit current initial value	
5.2 Short-circuit current peak, symmetrical breaking current and steady-state short-circuit current	
5.3 The simultaneous occurrence of two independent single-phase ground short circuit to ground short circuit current distribution	
6 In the case of asymmetrical short-circuit through the grounding of the local short-circuit current	
6.1 Overview	
6.2 Single-phase grounding within the plant	
6.3 Single-phase short-circuit outside the plant	
6.4 Single-phase ground near the plant short circuit	
7 Reduction factor of overhead lines with ground	
8 Current distribution and reduction factor calculation of metal sheath or shielded grounding cable	
8.1 Overview	
8.2 Three-core cable	
8.3 Three single-core cable	
Appendix A (informative) Simultaneous two independent single-phase ground short circuit calculation example	
Appendix B (Informative) Short-circuit current through the earth calculation example	
Appendix C (informative) Three-core cable reduction factor and ground current distribution calculation example	
Appendix D (informative) three single-core current reduction factor r_3 and ground current distribution calculation example	

Foreword

GB/T 15544 "three-phase AC system short-circuit current calculation" is divided into the following five parts.

- Part 1. Current calculation;
- Part 2. Short-circuit current calculation of the application of the coefficient;
- Part 3. Electrical equipment data;
- Part 4. Simultaneous two separate single-phase ground fault current and the current flow through the earth;
- Part 5. Example.

This section GB/T 15544 Part 4.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method is equivalent to using IEC 60909-3.:2009 "Three-phase AC system short-circuit current calculation Part 3. Simultaneous Current at two independent single-phase ground faults and current through the earth. " this section made the following editorial changes.

--- In line with the existing standard series, the standard name was changed to "three-phase AC system short-circuit current calculation Part 4. Simultaneous Current at two independent single-phase ground faults and current through the earth. " this part is proposed by China Electricity Council.

This part of the national standardization of short-circuit current calculation Technical Committee (SAC/TC424) centralized.

This section is drafted. China Electric Power Research Institute, State Grid Corporation of China State Power Dispatching and Communication Center, Xi'an Jiaotong University.

1 Scope

GB/T 15544 This section gives the expected high-voltage three-phase AC system (50Hz or 60Hz) in the case of short circuit imbalance expected short Current calculation steps, namely.

- a) current at the same time as two independent single-phase-to-ground shorts occur simultaneously in a neutral ungrounded system or in a neutral high-impedance earthed system;
- b) Neutral direct or neutral low-impedance grounding system occurs in the case of a single-phase ground short circuit through the local Short circuit current.

The current calculated using these calculation steps is used to determine the induced voltage, contact voltage or voltage across the power plant or substation and overhead line tower Step voltage and ground potential rise.

This calculation gives the calculation of the reduction factor for one or two overhead lines.

This section does not include.

- a) Short-circuit current specifically generated under controlled conditions (such as in a short-circuit test station);
- b) short-circuit current in the electrical installation of a ship or aircraft;
- c) Neutral or ungrounded Neutral A single-phase ground fault occurs in a high-impedance grounded system.

The purpose of this section is to develop practical, concise steps for the calculation of two separate single-phase ground short-circuit ground short-circuit Flow, and partial short-circuit current from the electrical equipment through the ground and the ground of the earth or overhead lines and the sheath or shield of the cable, Conservative results with sufficient accuracy. For this purpose, an equivalent voltage source is introduced at the place of a short circuit and all other voltage sources are assumed to be zero. When calculated short Road short circuit current, the station ground impedance and tower line tower overhead resistance to be ignored.

This section is to supplement GB/T 15544.1. Basic definitions, symbols and calculation assumptions can be found in GB/T 15544.1. Headquarters Only a few special projects are defined or explained.

Calculation of short-circuit parameters in accordance with the electrical equipment rated data, the system topology, which makes short-circuit calculation can be applied to existing systems or regulations Scheduling system. This section does not exclude other algorithms that can achieve the same accuracy under certain conditions, such as overlay.

As described in GB/T 15544.1, short-circuit current and its parameters can also be determined by the system test.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 15544.1-2013 Three-phase AC system short-circuit current calculation - Part 1. Current calculation (IEC 60909-0.:2001, IDT) GB/T 15544.3-2017 Three-phase AC system short-circuit current calculation - Part 3. Electrical equipment data (IEC/T R60909-2.

2008, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.