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

GB/T 46959-2025

Short-circuit power calculation in three-phase AC systems

三相交流系统短路容量计算

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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. 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 Electricity Council. This document is under the jurisdiction of the National Technical Committee on Standardization of Short-Circuit Current Calculation (SAC/TC424). This document was drafted by: China Electric Power Research Institute Co., Ltd., State Grid Corporation of China, and the Northwest Branch of State Grid Corporation of China. State Grid Corporation of China Central China Branch, State Grid Shandong Electric Power Company, Envision Energy Co., Ltd., North China Electric Power University, China Southern Power Grid Research Institute Research Institute Limited Liability Company. The main drafters of this document are. Wang Hongfu, Li Yalou, Wang Meng, Zhang Yantao, Zhou Qinyong, Zhang Yuhong, Wang Tiezhu, Mu Shixia, Li Xin, and Liu Mingsong. Bi Tianshu, Jia Ke, Deng Zhaoshun, Yang Lu, Zhao Dan, Zhang Xin, Li Rimin, Zhang Zhiqiang, Chang Song, Luan Songtao, Li Suning, Liu Huakun, Zhao Ligang, Duan Xiangying Wang Yi, Tao Xianghong, Liu Yanjia, Fan Yana, Zhang Haishun, Huang Jinzhi, Shi Mengxuan, Luo Kui, Guo Yarong, Pang Guangheng, Li Xinnian, Lin Shaobo, Zhang Libo Pan Bingru, Tu Sijia, Luan Kedong, Li Xiaoxiao, Hou Weilin, Cui Wei.

Short-circuit capacity is an important indicator characterizing the voltage strength (or voltage support capability) of a power system, reflecting the voltage levels during steady-state operation and... The ability to maintain voltage safety after being subjected to disturbances is of great importance in areas such as short-circuit ratio calculation and power quality assessment in new energy or DC-connected systems. Function. GB 38755 sets forth the principle requirements for short-circuit capacity support capacity and short-circuit ratio, etc., to adapt the short-circuit capacity calculation method to... This

document is compiled to meet the needs of the development of new power systems and to guide the scientific application of short-circuit capacity. Short-circuit capacity calculation of a three-phase AC system

1 Scope

GB/T 46959-2025 is the Chinese national standard covering the short-circuit power at a point in a network - the figure from which every switchgear rating, every protection setting and every voltage dip calculation follows, computed for the symmetrical and unsymmetrical fault types. First edition, and it is the classical counterpart of GB/T 47510-2026 on inverter-connected sources, which behave nothing like this. It was issued on 31 December 2025 and has been in force since 1 July 2026, as a first edition. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the general requirements for short-circuit capacity calculation and describes the short-circuit current method and the sensitivity method. This document applies to the calculation of short-circuit capacity in three-phase AC power systems.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 156 Standard Voltage

GB/T 15544.1 Short-circuit current calculation for three-phase AC systems - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 156 and GB/T 15544.1, as well as the following terms and definitions, apply to this document.

3.1 Short-circuit power The product of the symmetrical short-circuit current, the system nominal voltage, and the coefficient 3 during a three-phase short circuit.

3.2 Initial short-circuit power The product of the initial value of the symmetrical short-circuit current during a three-phase short circuit, the system nominal voltage, and the coefficient 3.

3.3 steady-state short-circuit power The product of the steady-state short-circuit current, the system nominal voltage, and a coefficient of 3 during a three-phase short circuit.

4 General Requirements

4.1 The calculation of short-circuit capacity should specify the time of study, including two special cases. initial short-circuit capacity and steady-state short-circuit capacity.

4.2 Short-circuit capacity calculations should distinguish between maximum values, minimum values, or given state values, and the power system operating mode should be selected according to the following rules.

- a) When calculating the maximum value, the operating mode that may lead to the maximum symmetrical short-circuit current during a three-phase short circuit is adopted;
- b) When calculating the minimum value, the operating mode that may lead to the minimum symmetrical short-circuit current during a three-phase short circuit is adopted;
- c) When calculating a given state value, the given operating mode is used.

4.3 Short-circuit capacity calculation methods include the short-circuit current method and the sensitivity method; examples are shown in Appendix A. Calculate the maximum or minimum short-circuit capacity. For calculating the given state value of short-circuit capacity, the short-circuit current method should be used; the short-circuit current method or the sensitivity method can be used to calculate the given state value of short-circuit capacity.

4.4 In the following cases, the sensitivity method should be used to calculate the short-circuit capacity.

- a) It is difficult to obtain the short-circuit current directly, but it is easy to obtain the voltage sensitivity to current;
- b) Consider the voltage regulation effect of synchronous generators, synchronous condensers, new energy power generation systems, energy storage, dynamic reactive power compensation, and other equipment over time.