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

GB/T 13626-2021

Replacing GB/T 13626-2008

**Application of the single-failure criterion for nuclear power
plant safety systems**

单一故障准则应用于核电厂安全系统

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions

Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents" drafted: This document replaces GB/T 13626-2008 "Single fault criterion applied to nuclear power plant safety system", and GB/T 13626-2008 In contrast, except for structural adjustments and editorial changes, the main technical changes are as follows:

- Changed the definition of common cause failure (see 3:4, 3:4 of the:2008 edition);
- Added evaluation requirements for undetectable faults (see 5:2);
- Deleted the example in "Cascading Faults" (see 5:3 of the:2008 edition);
- Changed the description of design basis event analysis requirements (see 5:4, 5:4 of the:2008 edition);
- Clarify that common cause failures are beyond the scope of the single failure criterion, and supplement the screening process for common cause failures (see 5:5,:2008 edition of 5:5);
- Changed the relevant description and chapter number in "Design Analysis of Single Failure" (see Chapter 6, Chapter 6 of the:2008 edition);
- Deleted "Probability Evaluation Characteristics" (see 6:3:2 of the:2008 edition);
- Added undetectable failure examples (see Appendix A): Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed and managed by the National Standardization Technical Committee of Nuclear Instrumentation (SAC/TC30): This document is drafted by: China Nuclear Power Engineering Co., Ltd., Institute of Nuclear Industry Standardization: The main drafters of this document: Xing Ji, Chen Rigang, Liao Shengyong, Jiang Mingyue, Cui Minglu, Zhang Dong, Wang Shaohua, Li Pengfei, Jiao Liling, Du Jian: The previous versions of this document and its superseded documents are as follows:
 - First published in August:1992 as GB/T 13626-1992, first revised in April:2001, second in

July:2008 revision;

---This is the third revision: Application of Single Fault Criterion to Nuclear Power Plant Safety System

1 Scope

GB/T 13626-2021 is the Chinese national standard on application of the single-failure criterion for nuclear power plant safety systems, in the field of energy and heat transfer engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 December 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2022. Classification: ICS 27.120.20, CCS F83. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the general principles and requirements for the application of the single fault criterion to the power, instrumentation and control parts of the safety system of a nuclear power plant: This document clarifies the single failure criterion, instructs safety systems how to apply the single failure criterion and proposes an acceptable single failure The analysis method is applicable to the safety system of nuclear power plant:

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document:

GB/T 7163 Reliability Analysis Requirements for Nuclear Power Plant Safety Systems

GB/T 9225 General principles for reliability analysis of safety systems in nuclear power plants

3 Terms and Definitions

The following terms and definitions apply to this document: 3:1 failure invalid An item has lost its intended function: 3:2 detectablefailure detectablefailure Faults that can be identified by periodic tests, or faults found by alarms or abnormal displays: NOTE

1 Component failures detected at the channel level, sequence level or system level are all detectable failures:

Note 2: Distinguishable but undetectable faults are faults judged by analysis: These faults cannot be found through periodic tests, nor can they be detected through alarms or exceptions: Findings are always displayed: 3:

3 Periodic test periodictest A test carried out at planned intervals to detect faults and check operability: 3:4 common cause failure commoncausefailure A failure in which two or more structures, systems or components fail due to a specified single event or cause: 3:5 designbasisevents Hypothetical initiating events used in the design to determine acceptable performance requirements for structures, systems and components: 3:

6 Drive device actuationdevice,actuator A component or collection of components that directly controls the motive power of an actuator (electricity, compressed air, hydraulic fluid, etc.):