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

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**Guidance for nuclear power plant electrical power systems
analysis**

核电厂电气系统分析指南

(English Translation)

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References

Foreword

This document is a standard or guiding technical document.

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 is modified to adopt IEC 62855:2016 "Electrical systems analysis for nuclear power plants", and the document type has been adjusted from the IEC standard.

It is a national standardization guiding technical document for my country.

Compared with IEC 62855:2016, this document has undergone the following structural adjustments.

---Chapter 4 of IEC 62855:2016 has been deleted.

The technical differences between this document and IEC 62855:2016, and the reasons therefor, are as follows.

---The section on "Abbreviations" has been removed to accommodate less frequent use of these terms in this document;

---The phrase "complete loss of AC power" (see 5.2.2 of IEC 62855:2016) has been removed from the "Design Extended Operating Conditions" section, firstly to align with... The operating conditions in HAD102/13-2021 remain consistent; secondly, no special provisions are made for operating conditions with complete loss of AC power. Research;

---The short-circuit current content has been changed to replace IEC 60909 (all parts) with GB/T 15544 (all parts) (see 6.4.1.1).

(IEC 62855:2016, section 7.4.1.1), to adapt to my country's standards system;

---Added a normative reference to GB 50057 for lightning protection grounding, and removed the normative reference to IEC 62305 (see 8.1.1) to accommodate this change. my country's technological conditions and the feasibility of providing operability;

---Some requirement clauses have been changed to recommended clauses (see Chapters 6-9 of IEC 62855:2016) to meet the requirements of the guideline. Requirements. The following editorial changes have been made to this document.

---To align with existing standards, the standard's name has been changed to "Guideline for Electrical System Analysis in Nuclear Power Plants";

---Appendix E (Informative) "Examples of Typical Structures for Electrical System Analysis Paths and Reports" has been added;

---Changes have been made to the general requirements for standard voltage and current effects on humans and livestock, low-voltage electrical installations, electromagnetic compatibility, instrumentation, and control systems.

Informative references to technical content are provided in GB/T 156, GB/T 13870, GB/T 16895, and GB/T 17625.

GB/T 40444 replaces IEC 60308, IEC 60479, IEC 60364, IEC 61000, and IEC 61513, respectively.

---The informative reference documents for the nuclear safety guidelines have been amended, replacing the IAEA references with HAD102/03 and HAD102/13 respectively. SSG.30, IAEASSG.34.

1 Scope

This document provides guidelines for analyzing AC and DC electrical systems in nuclear power plants. Electrical system analysis is used to demonstrate the capabilities of the power supply and distribution systems.

Sufficient to support the safe operation and shutdown of nuclear power plants, and to enable nuclear power plants to enter a controllable state and ultimately recover after a anticipated operational event or accident. A safe state has been reached.

This document applies to.

---Verify the design of a new nuclear power plant;

---Demonstrate the adequacy and impact of major modifications to the electrical systems of operating nuclear power plants;

---Assess and determine the operating limits and constraints for nuclear power plants in operation.

The relevant provisions of this document also apply to nuclear power plants in the

decommissioning phase. This document is not applicable to.

---Digital controllers used in electrical systems (such as controllers for rectifiers, inverters, sequencers, and electrical protection devices) (piece);

---Environmental conditions (such as temperature and humidity) and external events (such as earthquakes, floods, fires) that may affect equipment selection or protection requirements.

High-energy electromagnetic pulses, etc., but include external events such as lightning and geomagnetic storms;

---Additional or special features to independent power systems, such as power supplies used as security measures in nuclear power plants;

---The content on improving the reliability of electrical systems in nuclear power plants by adopting statistical or diversity and redundancy schemes;

---Personnel safety protection measures during the installation, maintenance and operation of electrical systems, as well as routine personal safety content. The methods or tools used in the analysis include.

---Verified and validated simulation tools (software and hardware);

---Calculated manually;

---test.

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 15544 (all parts) Short-circuit current calculation for three-phase AC systems [IEC 60909 (all parts)]

Note: GB/T 15544.1-2023 Short-circuit current calculation for three-phase AC systems - Part 1: Current calculation (IEC 60909-0:2016, MOD);

GB/T 15544.2-2017 Calculation of short-circuit current in three-phase AC systems - Part 2: Coefficients applied in the calculation of short-circuit current (IEC TR60909-1. 2002, IDT);

GB/T 15544.3-2017 Short-circuit current calculation for three-phase AC systems - Part 3: Data for electrical equipment (IEC TR60909-2:2008, IDT);

GB/T 15544.4-2017 Short-circuit current calculation for three-phase AC systems - Part 4: