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

GB/T 13631-2023

Replacing GB/T 13631-2015

**Criteria for the design of the supplementary control room of
nuclear power plant**

核电厂辅助控制室设计准则

(English Translation)

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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:

This document replaces GB/T 13631-2015 "Design Guidelines for Auxiliary Control Points in Nuclear Power Plants": Compared with GB/T 13631-2015, except for in addition to structural adjustments and editorial changes, the main technical changes are as follows:

---Changed the scope of application of the document (see Chapter 1, Chapter 1 of the:2015 edition);

---Added the term "design extended working conditions" (see 3.2);

---Added the content of ergonomic design, which is a technical reference for assisting human factors engineering principles in control room design activities (see Chapter 4, Chapter 6);

--- Added requirements for system verification and validation (see Chapter 7):

This document is modified to adopt IEC 60965:2016 "Auxiliary control of nuclear power plant control rooms to achieve reactor shutdown without entering the main control room:" "Preparation Point":

Compared with IEC 60965:2016, this document has made the following structural adjustments:

---Chapter 4 corresponds to Chapter 5 of IEC 60965:2016: Among them, 4:1~4:4 corresponds to 5:1~5:4 of IEC 60965:2016: for ease of reference, 4:2 is split into 12 clauses, of which 4:2:1~4:2:12 correspond to 5:2 of IEC 60965:2016: For ease of reference Use, split 4:3:4 into 7 items, of which 4:3:4:1~4:3:4:7 correspond to 5:3:4 of IEC 60965:2016:

---Chapter 5 corresponds to Chapter 6 of IEC 60965:2016:

---Chapter 6 corresponds to Chapter 7 of IEC 60965:2016: Among them, 6:1~6:9 corresponds to 7:1~7:9 of IEC 60965:2016: for ease of reference, 6:9 is split into 2 clauses, of which 6:9:1~6:9:2 correspond to 7:9 of IEC 60965:2016:

---Chapter 7 corresponds to Chapter 8 of IEC 60965:2016:

The technical differences between this document and IEC 60965:2016 and their reasons are as follows:

---Changed the introductory words for terms and definitions (see Chapter 3) to adapt to my country's technical conditions;

---Abbreviations are deleted (see Chapter 4 of IEC 60965:2016), and English abbreviations are not used in this document;

---The requirements for the design principles of the auxiliary control room have been replaced with HAF102-2016 and HAD102/10-2021 respectively:

IAEASSR-2/1:2012 and IAEANS-G-1:3:2002 (see 4.1), and adjusted from normative references to informative references Used to adapt to my country's technical conditions;

---Changed the requirements for accessibility and control room personnel transfer time (see 4.3:3) to adapt to my country's technical conditions;

--- Regarding the requirements for the design principles of nuclear power plant control rooms, IEC 60964 was replaced with the normatively cited GB/T 13630 (see 4.2:12,

Chapter 5) to adapt to my country's technical conditions;

--- Regarding the requirements for the isolation of important safety instruments and control systems in nuclear power plants, IEC 60709 was replaced with NB/T:20060 (see 4.3:2), to adapt to my country's technical conditions;

---Deleted the reference to IEC 61226 (see 5.3:2 of IEC 60965:2016) to adapt to the technical conditions of various reactor types in my country;

---Changed the requirements for the hazard tolerance of auxiliary control points (see 4.2:11) to adapt to my country's technical conditions;

--- Regarding the design principles of the control center, ISO 11064-1 and GB/T 22188.3 were replaced with GB/T 22188.1 and GB/T 22188.3 respectively:

ISO 11064-3, added GB/T 22188.2 (see 6.5) to adapt to my country's technical conditions;

--- Regarding the design verification and validation of nuclear power plant control rooms, EJ/T 1118 replaced IEC 61771 (see Chapter 7), and changed from normative the citation is adjusted to informational citation to adapt to my country's technical conditions:

The following editorial changes have been made to this document:

---In order to coordinate with existing standards, the name of the standard is changed to "Design Guidelines for Auxiliary Control Rooms of Nuclear Power Plants";

---Deleted the statement about the instrument and control system (see Chapter 7), because it does not fall within the scope of this document, and the deletion will not affect the understanding of the standard:

use:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies the design requirements for the auxiliary control room of a nuclear power plant, including the design criteria, design process, functional design and and system verification and validation:

This document is applicable to the design of auxiliary control rooms for new nuclear power plants, as well as the design improvement of auxiliary control rooms for existing nuclear power plants:

This document does not apply to the detailed design of auxiliary control room equipment:

2 Normative reference documents

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

GB/T 13630 Nuclear power plant control room design (GB/T 13630-2015, IEC 60964:2009, MOD)

3 Terms and definitions

The following terms and definitions apply to this document:

control room staff A group of nuclear power plant staff who are on duty in the control room, control the nuclear power plant through the human-machine interface and are responsible for completing the power plant operation goals:

Note: Typically, control room personnel include the shift leader and operators performing control operations, and may also include authorized access to the control room during prolonged events:

other personnel and experts:

[Source: GB/T 13630-2015, 3:2, with modifications] 3.2 Accident conditions that are not considered within the scope of design basis accidents shall be considered in the design process according to the best estimation method, and the accident conditions the release of radioactive materials is within acceptable limits: Design extended conditions include conditions that do not cause significant damage to the core and core meltdown (serious accident) working conditions:

A control point (or facility) set outside the control room where local operators perform control activities:

[Source: GB/T 13630-2015,3:15] 3.4 localoperatorslocaloperators Operators performing tasks outside the control room:

[Source: GB/T 13630-2015,3:16] 3.5 operatingstaffoperatingstaff Nuclear power plant workers working the operating shift: