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Interested committees:

Title: Draft BS EN 60960 Ed.2.0 Functional design criteria for a safety parameter display system for nuclear power stations

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



45A/1590/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER: IEC 60960 ED2	
DATE OF CIRCULATION: 2025-02-14	CLOSING DATE FOR COMMENTS: 2025-05-09
SUPERSEDES DOCUMENTS: 45A/1550/RR	

IEC SC 45A : INSTRUMENTATION, CONTROL AND ELECTRICAL POWER SYSTEMS OF NUCLEAR FACILITIES	
SECRETARIAT: France	SECRETARY: Mr Alexander WIGG
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED: Safety	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:
Functional design criteria for a safety parameter display system for nuclear power stations

NOTE FROM TC/SC OFFICERS:

In accordance with the discussions held during the WGA8 meeting which took place on 13th December 2024, and in agreement with the WGA8 Convenor and IEC SC45A Secretary, IEC 60960 is to proceed to Committee Draft stage for comments from IEC National Committees for a period of 12 weeks. Resolutions to comments received on the CD will be discussed during the IEC SC45A technical and plenary meetings in June 2025.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**NUCLEAR POWER PLANTS – HUMAN MACHINE INTERFACES –
FUNCTIONAL DESIGN CRITERIA FOR A SAFETY PARAMETER DISPLAY
SYSTEM**

FOREWORD

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IEC 60960 has been prepared by subcommittee 45A : Instrumentation, control and electrical power systems of nuclear facilities, of IEC technical committee 45: Nuclear instrumentation. It is an International Standard.

This second edition cancels and replaces the first edition published in 1988. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) to align on the present the standard series of IEC 60964, review of the existing requirements and updating of the terminology and definitions;
- b) to take into account, as much as possible, requirements associated with standards published since the first edition of IEC 60960, especially IEC 61513, IEC 60964, IEC 61839, IEC 63147, IEC 61772, IEC 63351, IEC 61771, IEC 60709, IEC 61226, IEC 60880, IEC 62138 and IEC 60987;
- c) to take into account the fact that digital techniques have advanced significantly in the intervening years;

- d) to revise the scope according to the practical experience of SPDS in nuclear power plants;
e) to align the content with nuclear power plant human factors engineering principles;
f) to adapt technique characteristic of different types of reactors;
g) to align the standard with the latest IAEA safety requirements in related work conditions;

The text of this International Standard is based on the following documents:

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

a) Technical background, main issues and organization of the standard

IEC 60960:1988 was developed to present the functional design criteria for safety parameter display systems (SPDS) in nuclear power plants (NPP), in order to achieve functional performance goals as much as possible under the technical conditions at that time. By selecting and gathering a minimum subset of parameters able to assess the safety states of NPP, SPDS provides the overall information in a concise and intuitive manner. This helps control room staff, and sometimes emergency response staff, make intuitive judgments about the safety status of the plant to prevent human errors in 'high-stress' situations.

In the design of I&C systems for old nuclear power plants, analog or digital-analog operation display was mainly used. At that time, SPDS were composed of relatively independent instruments, displays, hardware, and computer software. It provided relatively concentrated and direct safety parameter display information for the operators in the control room of the NPP. Safety parameters displayed in SPDS were often selected according to the principle of minimization to avoid SPDS with a large scale at that time. With the widespread application of digital technology in the I&C systems of NPPs, a technical foundation has been provided for the information display to be diverse and rich, and the display screen to be flexible and intuitive.

In recent years, the SPDS of newly built and under-construction nuclear power plants internationally have most been integrated into digital plant I&C systems using digital technology solutions, but its functions still exist relatively independently within the I&C systems of NPPs for specific use. In addition, as IAEA nuclear safety standards and the IEC control room design standard system gradually improving, not only are more comprehensive requirements proposed for the design of SPDS, but also a framework for the design standard system is provided for its orderly application in NPPs. This will promote the development and standardization of SPDS design and also aid in improving the safety status of the NPP.

It was recognized that there was a need to revise the 1988 edition to address:

- To update terms to align with the latest IAEA, ISO, and IEC documents.
- To update normative reference documents to adapt the latest standard content.
- To incorporate the design requirements and recommendations for SPDS based on digital technology.
- To accommodate the selection of safety parameters in different reactor types.
- To implement principles of human factors engineering in design.
- To add some requirements for the application of intelligent technology.

This document is intended to be used by NPP designers, control room staff, systems evaluators (also called nuclear safety engineers), emergency response staff, and regulatory inspectors.

b) Situation of the current standard in the structure of the IEC SC 45A standard series

This standard is a third level IEC SC 45A document tackling the generic issue of SPDS of NPPs. IEC 60964 is the second level IEC SC 45A document relating to the more general issue of control room design for NPPs.

IEC 60964 provides requirements for data acquisition and processing, display system and alarm system of control room. In addition, operating support functions are mentioned in sub-clause 8.7.2.5 of IEC 60964-2018. It says, "safety parameter display should be provided", but specific design requirements are not provided.

This standard is intended to deal with the specific aspects of a SPDS, as a supplementary to sub-clause 8.7.2.5 of IEC 60964-2018. This standard is mutually referenced and supplemented with IEC 63435.

Figure 1 shows the set of IEC SC 45A standards that collectively give requirements for control rooms, human-machine interfaces (HMI) and human factors engineering (HFE).