BS IEC 60860:2014

BSI Standards Publication

Radiation protection instrumentation — Warning equipment for criticality accidents

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee NCE/2, Radiation protection and measurement.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Radiation protection instrumentation – Warning equipment for criticality accidents

Instrumentation pour la radioprotection – Equipement de signalisation des accidents de criticité

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CONTENTS

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RADIATION PROTECTION INSTRUMENTATION – WARNING EQUIPMENT FOR CRITICALITY ACCIDENTS

FOREWORD

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International Standard IEC 60860 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation.

This second edition cancels and replaces the first edition issued in 1987. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

– reference to IEC 61508 concerning the safety classification;
– introducing requirement for the alarm sound level (90 dBA and 115 dBA at a distance of 1 m from the alarm source);
– energy response requirement changes from (–35 %, +35 %) to (–35 %, +50 %);
– time period of 1 min is specified for the overload requirement (1 $kGy \cdot h^{-1}$ during a period of at least 1 min);
– updated EMC, mechanical and environmental requirements according to IEC 62706.

The text of this standard is based on the following documents:

FDIS	Report on voting
45B/791/FDIS	45B/794/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

RADIATION PROTECTION INSTRUMENTATION – WARNING EQUIPMENT FOR CRITICALITY ACCIDENTS

1 Scope and object

This International Standard applies to equipment intended to provide warning of a criticality accident by the detection of gamma radiation, neutrons or both from such an event.

This standard is primarily intended to apply to equipment design and, therefore, does not address the need for placement of such equipment. The need for criticality alarm systems and the utilisation procedures are described in ISO 7753 and ISO 11320.

The primary purpose of the criticality alarm system is to detect radiation from criticality accidents and warn personnel. Suitable alarms shall be provided so that personnel present in the area involved and in adjacent effected areas (often the complete facility) can be warned in the event of a criticality accident occurring. These alarms are intended to activate an evacuation alarm to reduce the probability of serious exposure to personnel.

Such systems may also have secondary functions, such as providing a follow-up measurement of the radiation level during the accident. The systems should only be used for these secondary functions, provided that the secondary functions have no adverse effect on the criticality alarms and their essential characteristics (for example, reliability) described in this standard.

The object of this standard is to prescribe general, radiation detection, environmental, mechanical, electromagnetic and documentation requirements and to specify acceptance criteria for criticality accident warning equipment.

This standard is not applicable to photon or neutron dose equivalent (rate) meters or monitors covered by IEC 60532, IEC 60846 (all parts), IEC 61017 (all parts), and IEC 61005. This standard is not applicable either to equipment or assemblies used in control and safety systems of nuclear reactors.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts): *International Electrotechnical Vocabulary* (available at http://www.electropedia.org)

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 62706, *Radiation protection instrumentation – Environmental, electromagnetic and mechanical performance requirements*

ISO 7753:1987, *Nuclear energy – Performance and testing requirements for criticality detection and alarm systems*