IEC 61322

Edition 2.0 2020-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Radiation protection instrumentation – Installed ambient dose equivalent rate meters, warning and monitoring assemblies for neutrons with energies from thermal to 20 MeV

Instrumentation pour la radioprotection – Débitmètres d'équivalent de dose ambiant, ensembles d'alarmes et moniteurs à poste fixe pour des énergies de neutrons comprises entre l'énergie thermique et 20 MeV

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CONTENTS

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RADIATION PROTECTION INSTRUMENTATION – INSTALLED AMBIENT DOSE EQUIVALENT RATE METERS, WARNING AND MONITORING ASSEMBLIES FOR NEUTRONS WITH ENERGIES FROM THERMAL TO 20 MeV

FOREWORD

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International Standard IEC 61322 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 published in 1994. This edition constitutes a technical revision.

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

– this document has been updated to take account of the requirements of the relevant IEC standards, IEC 60532:2010 and IEC 61005:2014.

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

FDIS	Report on voting
45B/944/FDIS	45B/952/RVD

Full information on the voting for the approval of this document 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- withdrawn,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 – INSTALLED AMBIENT DOSE EQUIVALENT RATE METERS, WARNING AND MONITORING ASSEMBLIES FOR NEUTRONS WITH ENERGIES FROM THERMAL TO 20 MeV

1 Scope

This document applies to installed dose equivalent rate meters, warning assemblies and monitors, as defined below. It covers equipment intended to measure neutron radiation in dose equivalent rates in the energy region between thermal and 20 MeV for the purposes of radiation protection.

Assemblies of this type are commonly defined as area radiation monitors. They are normally employed to determine continuously the radiological situation in working areas in which the radiation field may change with time, for example, nuclear power plants, particle accelerators, high-activity laboratories, fuel reprocessing plants, etc., and provide alarms when the radiation field goes outside predetermined limits.

The assemblies considered in this document comprise at least:

– a detector assembly, which may, for example, consist of a detector probe (for thermal neutrons such as BF_3 proportional counter, ^3He proportional counter, $^6LiI(Tl)$ scintillation detector, etc.) and a moderating and absorbing medium surrounding the detector;
– a processing assembly, which may be fitted into a centralized panel, which, in the case of warning assemblies and monitors, provides signal outputs and contacts capable of activating alarm or other trip circuits;
– alternatively, the case when all the processing electronics are placed within the detection unit (so called "smart blocks") may be considered. In this case the functions of the processing assembly will be composed of only the indication, the providing signal outputs and contacts.

This document specifies general characteristics, general test procedures, radiation characteristics, as well as electrical, mechanical, safety, and environmental characteristics, as well as the identification certificate for the assemblies defined in the scope.

Assemblies designed to perform combined functions comply with the requirements pertaining to each of these functions.

This document is not applicable to criticality monitors covered by IEC 60860, or to assemblies intended to give information about operational parameters of nuclear plants for control purposes. This document is not applicable to the operating characteristics of indicating or recording instruments as such (for instance, indicating meters, recorders, etc.). The characteristics of such instruments are in conformity with the general requirements appropriate to them.

This document does not cover hand-held neutron dose (rate) meters and instruments that are covered in IEC 61005.

No tests are specified in this document for performance requirements in pulsed radiation fields. It is understood that an assembly designed to meet this document may not be suitable for use in these fields.