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Edition 1.1 2020-07
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

colour inside

Radiation protection instrumentation – Data format for radiation instruments used in the detection of illicit trafficking of radioactive materials

IEC 62755:2012-10+AMD1:2020-07 CSV(en)

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IEC 62755:2012-10+AMD1:2020-07 CSV(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RADIATION PROTECTION INSTRUMENTATION – DATA FORMAT FOR RADIATION INSTRUMENTS USED IN THE DETECTION OF ILLICIT TRAFFICKING OF RADIOACTIVE MATERIALS

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62755 edition 1.1 contains the first edition (2012-10) [documents 45B/739/FDIS and 45B/748/RVD] and its amendment 1 (2020-07) [documents 45B/953/CDV and 45B/964/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62755 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation.

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

This standard contains attached files in the form of a zip file. These files are intended to be used as a complement and do not form an integral part of the standard.

The committee has decided that the contents of the base publication and its amendment 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- withdrawn,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.

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RADIATION PROTECTION INSTRUMENTATION – DATA FORMAT FOR RADIATION INSTRUMENTS USED IN THE DETECTION OF ILLICIT TRAFFICKING OF RADIOACTIVE MATERIALS

1 Scope and object

The purpose of this International Standard is to provide a uniform format for data to be output from radiation measurement instruments for use in detection of illicit trafficking of radioactive materials. This enables interpretation of data without reference to manufacturer's documentation.

This standard specifies the data format used for both required and optional data available at the output of radiation measurement instruments that are used for the detection of illicit trafficking of radioactive materials. The performance requirements for these types of radiation measurement instruments are described in other standards such as IEC 62401, IEC 62533, IEC 62694, IEC 62244, IEC 62327, IEC 62484, and IEC 62618 [26][1].

The output consists of measurement data and results of any analysis performed by the radiation measurement instrument.

This standard does not address instrument control, data transmission protocols, or the physical media used for communications.

To ensure the largest interoperability of radiation instruments and worldwide operations, the technical content (e.g. data elements and attributes, document structure) of this standard matches the ANSI/IEEE N42.42 standard [28].

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 60050-393:2003, *International Electrotechnical Vocabulary – Part 393: Nuclear instrumentation – Physical phenomena and basic concepts*

IEC 60050-394:2007, *International Electrotechnical Vocabulary – Part 394: Nuclear instrumentation – Instruments, systems, equipment and detectors*

ISO/IEC 10646-1, Information technology – *Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*[2]

ISO/IEC 11578, Information technology – *Open Systems Interconnect – Remote Procedure Call (RPC)*[3]

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1 Numbers in square brackets refer to the Bibliography.

2 The Unicode Consortium's Unicode Standard 4.0 is equivalent to the ISO document.

3 The Universally Unique Identifier (UUID) URN Namespace from W3C RFC 4122 is an equivalent standard covering the format of the UUID. Available at http://www.ietf.org/rfc/rfc4122.txt

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

3 Terms, definitions, abbreviations, quantities and units

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions, as well as those given in IEC 60050-393 and IEC 60050-394 apply.

3.1.1
air-kerma
kerma in a small volume of air

3.1.2
ambient dose equivalent
H*(10)
dose equivalent at a point in a radiation field, produced by the corresponding aligned and expanded field, in the ICRU sphere at a depth of 10 mm, on the radius opposing the direction of the aligned field

Note 1 to entry: see ICRU Report 39 and 47.

Note 2 to entry: In defining these quantities, it is useful to stipulate certain radiation fields that are derived from the actual radiation field. The terms "expanded" and "aligned" are used to characterise these derived radiation fields. In the expanded field, the fluence and its angular and energy distribution have the same values throughout the volume of interest as in the actual field at the point of reference. In the aligned and expanded field, the fluence and its energy distribution are the same as in the expanded field but the fluence is unidirectional.

Note 3 to entry: The ICRU sphere (see ICRU Report 33) is a 30 cm diametre, tissue-equivalent sphere with a density of 1 g•cm^{-3} and a mass composition of tissue equivalent material (see IEC 60050-393:2003, 393-14-78).

Note 4 to entry: The recommended depth d, for environmental monitoring in terms of H*(d) is 10 mm, and H*(d) may then be written as H*(10).

Note 5 to entry: An instrument that has an isotropic response and is calibrated in terms of H*(d) will measure H*(d) in radiation fields that are uniform over the dimensions of the instrument.

Note 6 to entry: The definition of H*(d) requires the design of the instrument to take account of backscatter.

[SOURCE: IEC 60050-393:2003, 393-14-95]

3.1.3
attribute
XML (eXtensible Markup Language) “name-value” construct contained in an XML element start tag

Note 1 to entry: Details are available at [4].

3.1.4
channel
bin of a spectral histogram

Note 1 to entry: Typically, a multichannel analyzer will increment the bin corresponding to the height of each recorded pulse. The contents of each bin are referred to as the “counts” in the channel (also referred to as the channel “value”).

Note 2 to entry: Because these histograms can be reprocessed in a variety of ways, the counts in each channel may be a real number (i.e. the counts need not be an integer).

3.1.5
channel position
real number representing the position in a spectral histogram along the channel axis in terms of channels and their fractional parts where the channel number of the left edge of the first