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Kärnenergi, kärnteknik och strålskydd – Ordlista – Del 2: Strålskydd (ISO 12749-2:2013, IDT)

Nuclear energy, nuclear technologies, and radiological protection – Vocabulary – Part 2: Radiological protection (ISO 12749-2:2013, IDT)

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The International Standard ISO 12749-2:2013 has the status of a Swedish Standard. This document contains the official English version of ISO 12749-2:2013.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

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Standarden är framtagen av kommittén för Kärnenergi, SIS/TK 405.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection.*

ISO 12749 consists of the following parts, under the general title *Nuclear energy, nuclear technologies, and radiological protection — Vocabulary*.

— *Part 2: Radiological protection*

The following parts are under preparation:

— *Part 3: Nuclear fuel cycle*

0. Introduction

0.1 General

This part of ISO 12749 provides terms and definitions for general nuclear energy concepts dealing with radiological protection and other related concepts, such as means of protection for human health and environment, measurement methods and instruments, and the prevision or direct determination of the effect of ionizing radiations on the body. Terminological data are taken from International Standards developed by the SC 2 and other technically validated documents such as the IAEA Glossary, IAEA BSS, ICRP, ICRU 60, ICRU 51, VIM, and BIPM.

Unambiguous communication of radiological protection concepts is crucial, taking into account the relevant implications that may arise from misunderstandings with regard to equipment and materials involved in the standards dealing with this subject. The market of radiological protection is a heterogeneous one because it comprises equipment designed, built, and operated along the safe practices defined by radiological protection specialists. This market also includes nuclear reactors, nuclear fuel cycle, and instruments to monitor both personnel and facilities and sites. In view of the foregoing, a large number of people having different levels of scientific and technical knowledge are involved; thus, there can be widely divergent understandings and assumptions about concepts. The results are poor communication, high risk of accidents, and duplication of effort as different groups are going to define concepts according to their perspectives.

Conceptual arrangement of terms and definitions is based on concepts systems that show corresponding relationships among radiological protection concepts. Such arrangement provides users with a structured view of this special subdomain within the nuclear energy sector and will facilitate common understanding of radiological protection concepts. Besides, concepts systems and conceptual arrangement of terminological data will be helpful to any kind of user because it will promote clear, accurate, and useful communication. At the end of this part of ISO 12749, an alphabetical index shows the terms followed by their corresponding notation.

0.2 Structure of the vocabulary

The terminology entries are presented in the conceptual order of the English preferred terms. Both a systematic index and an alphabetical index are included. The structure of each entry is in accordance with ISO 10241-1:2011.

All the terms included in this part of ISO 12749 deal exclusively with radiation protection. When selecting terms and definitions, special care has been taken to include the terms that need to be defined, that is to say, either because the definitions are essential to the correct understanding of the corresponding concepts or because some specific ambiguities need to be addressed.

The notes appended to certain definitions offer clarification or examples to facilitate understanding of the concepts described. In certain cases, miscellaneous information is also included, for example, the units in which a quantity is normally measured, recommended parameter values, references, etc.

According to the title, the vocabulary deals with concepts belonging to the general ***nuclear energy*** subject field within which concepts in the **radiological protection** sub-subject field are taken into account.

Nuclear energy, nuclear technologies, and radiological protection — Vocabulary —

Part 2:
Radiological protection

Scope

This part of ISO 12749 lists unambiguous terms and definitions related to radiological protection concepts in the subject field of nuclear energy. It is intended to facilitate communication and promote common understanding.

1 General terms related to radiological protection

1.1
radiological protection
radiation protection
protection of people and the environment from the harmful effects of exposure to ionizing radiation and the means for achieving such protection

[SOURCE: IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection – 2007 Edition, modified — By adding "and the environment".]

1.1.1
radiation source
anything (apparatus, substance, installation) that may cause radiation exposure, such as by emitting ionization radiation or releasing radioactive substances or materials

[SOURCE: ISO 14152:2001]

1.1.1.1
radioactivity
stochastic process whereby nuclei undergo spontaneous disintegration, usually accompanied by the emission of subatomic particles, or photons

[SOURCE: IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection – 2007 Edition, modified — By deleting "random" between "spontaneous" and "disintegration".]

1.1.1.1.1
radioactive material
material of which one or more constituents exhibit *radioactivity* (1.1.1.1)

Note 1 to entry: For special purposes such as regulation, this term may be restricted to *radioactive material* (1.1.1.1.1) with an activity or a specific activity greater than a specified value.

[SOURCE: ISO 921:1997]

1.1.1.1.1.1
radioactive contamination
radioactive substances on surfaces, or within solids, liquids, or gases (including the human body), where their presence is unintended or undesirable, or the process giving rise to their presence in such places

[SOURCE: IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection – 2007 Edition]

1.1.1.1.1.1.1
surface contamination
radioactive material (1.1.1.1.1) deposited on surfaces of facilities (floor surface, work bench tops, machines, etc.), equipment, or personnel

1.1.2
equilibrium equivalent radon concentration
concentration of radon in air, in equilibrium with its short-lived decay products, which would have the same potential alpha energy concentration as the existing non-equilibrium mixture

[SOURCE: UNSCEAR 2006, Appendix E]

1.1.2.1
equilibrium factor
ratio of the equilibrium equivalent concentration of radon to the actual radon concentration

[SOURCE: IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection – 2007 Edition]

1.1.3
justification
process of determining for a planned exposure situation whether a practice is, overall, beneficial or for an emergency exposure situation or an existing exposure situation whether a proposed protective action or remedial action is likely, overall, to be beneficial

[SOURCE: Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - Interim Edition IAEA Safety Standards Series GSR Part 3, 2011]

1.1.4
optimization of protection
process of determining what level of protection and safety makes exposures, and the probability and magnitude of potential exposures, as low as reasonably achievable, economic and societal factors being taken into account

[SOURCE: ICRP 103, modified — By adding “as low as reasonably achievable, economic and societal factors being taken into account” at the end.]

1.1.5
dose
measure of the energy deposited by radiation in a target

[SOURCE: Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - Interim Edition IAEA Safety Standards Series GSR Part 3, 2011]

Note 1 to entry: Abbreviation for any of the existing dose quantities such as absorbed dose, effective dose, or equivalent dose.

Note 2 to entry: If unqualified, the dose quantity should be indicated by the context.

1.1.6
dose limit
limit on *equivalent dose* (3.3.2) and/or on *effective dose* (3.3.4) that is applied for exposure to individuals in order to prevent the occurrence of radiation-induced deterministic effects or to limit the probability of radiation-related stochastic effects to an acceptable level

[SOURCE: National Council on Radiation Protection and Measurements USA, Glossary, modified — By changing “radiation dose” to “equivalent dose” and adding “and/or on effective dose”.]

1.1.6.1
partial-body dose
equivalent dose (3.3.2) to tissue, organs, or parts of the body

Note 1 to entry: Identified by the name of the part of the particular tissue, organ, or body, e.g. bone marrow dose, skin dose, hand dose, testes dose, or dose to the lens of the eyes.

Note 2 to entry: The unit of *equivalent dose* (3.3.2) is joule per kilogram ($J \cdot kg^{-1}$) and its special name is sievert (Sv).

[SOURCE: ISO 15382:2002, modified — By stating the examples in Note 1 and adding Note 2.]

1.1.6.2
annual dose
dose from *external exposure* (3.2) in a year plus the *committed dose* (3.1.2) from intakes of radionuclides in that year

[SOURCE: IAEA Basic Safety Standards, March 2011]

1.1.6.3
total dose
dose from *external exposure* (3.2) in a given period plus the *committed dose* (3.1.2) from intakes of radionuclides in that same period

[SOURCE: IAEA – Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - Interim Edition IAEA Safety Standards Series GSR Part 3, 2011]

1.1.7
dose constraint
prospective and source-related value of individual dose or risk that is used in *planned exposure situations* (3.4.1) as a parameter for the *optimization of protection* (1.1.4) and safety for the source, and that serves as a boundary in defining the range of options in optimization

[SOURCE: IAEA – Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - Interim Edition IAEA Safety Standards Series GSR Part 3, 2011]

1.1.8
derived limit
limit on a measurable quantity set, on the basis of a model, such that compliance with the derived limit may be assumed to ensure compliance with a primary limit

[SOURCE: IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection – 2007 Edition]

1.1.9
derived air concentration
DAC
derived limit (1.1.8) on the activity concentration in air of a specified radionuclide, calculated such that reference individual, breathing air with constant contamination at the concentration while performing light physical activity for a working year, would receive an intake corresponding to the *annual limit on intake* (1.1.9.1) for the radionuclide in question

[SOURCE: IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection – 2007 Edition, modified — By replacing “Reference Man” with “reference individual”.]

Note 1 to entry: The parameter values recommended by the International Commission on Radiological Protection for calculating DACs are a breathing rate of 1,2 m^3/h and a working year of 2 000 h.