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

Part 5: Nuclear reactors

Énergie nucléaire, technologies nucléaires, et radioprotection — Vocabulaire —

Partie 5: Réacteurs nucléaires

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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 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*.

This second edition cancels and replaces the first edition (ISO 12749-5:2018), which has been technically revised.

The main changes are as follows:

— the addition of the following sentence in the Scope: “The scope of this document does not cover nuclear fusion reactors.”

— the updated of all the sources of the terminological entries.

— the addition of the heading “Terms related to nuclear fission”.

— the deletion of the heading “Terms related to multiple-purpose reactors”.

A list of all parts in the ISO 12749 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document provides terms and definitions for main concepts in the whole field of nuclear reactor science, technology, engineering, projects and operations, excluding quantitative data. Terminological data are taken from ISO standards developed by TC 85/SC 6, from other technically validated documents issued by international organizations, especially IAEA and IEC, while several definitions have been drafted by WG 1 experts based on their experience and after detailed discussions on concept characteristics, the best wording for their designations and definitions, as well as the most important links between concepts.

In most cases, international consensus exists among the communities of nuclear reactor specialists world-wide, on the most relevant concepts in the nuclear reactor field. Nevertheless, clear, and unambiguous terms for these concepts are also needed.

The foregoing should also be considered together with the fact that many people are involved in the broad nuclear reactor field, having different scopes and levels of scientific and technical knowledge, and frequently having very specific activities within that broad field. Thus, there can be different understandings and assumptions about concepts. Hence, the result could be a poor communication that might lead into unexpected, different risky situations or consequences, if a conceptual difference is behind.

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

Part 5: Nuclear reactors

1 Scope

This document encompasses the collection of terms, definitions, notes to entry and examples corresponding to nuclear reactors, excluding quantitative data. It provides the minimum essential information for each nuclear reactor concept represented by a single term. Full understanding of concepts requires background knowledge of the nuclear field. It is intended to facilitate communication and promote common understanding.

The scope of this document does not cover nuclear fusion reactors.

NOTE See Annex A for the methodology used to develop the vocabulary.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 General terms related to nuclear reactors

3.1.1
nuclear installation
nuclear facility subject to authorization that is part of the nuclear fuel cycle, except facilities for the mining or processing of uranium ores or thorium ores and disposal facilities for radioactive waste

[SOURCE: IAEA. *IAEA Nuclear Safety and Security Glossary. Terminology Used in Nuclear Safety, Nuclear Security, Radiation Protection and Emergency Preparedness and Response*. Vienna: IAEA, 2022. 246 p. ISBN 978-92-0-141822-7]

3.1.2
nuclear reactor
special device having an inventory of nuclear fuel material containing *fissionable nuclides* (3.2.16) and, depending on the technology, can have neutron moderating, neutron absorbing and cooling materials, all of them geometrically arranged in a particular *neutron multiplicative configuration* (3.2.10) designed and built for having the capability of initiating, maintaining and extinguishing a controlled, self-sustaining *nuclear fission* (3.2.1) chain reaction, under adequate safety conditions

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