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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

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

Introduction

This document provides terms and definitions for main concepts in the whole area 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 a number of definitions have been drafted by WG 1 experts on the basis of 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 area. Nevertheless, clear and unambiguous terms for these concepts are also needed.

The foregoing needs also to be considered together with the fact that a large number of people are involved in the broad nuclear reactor area, 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.

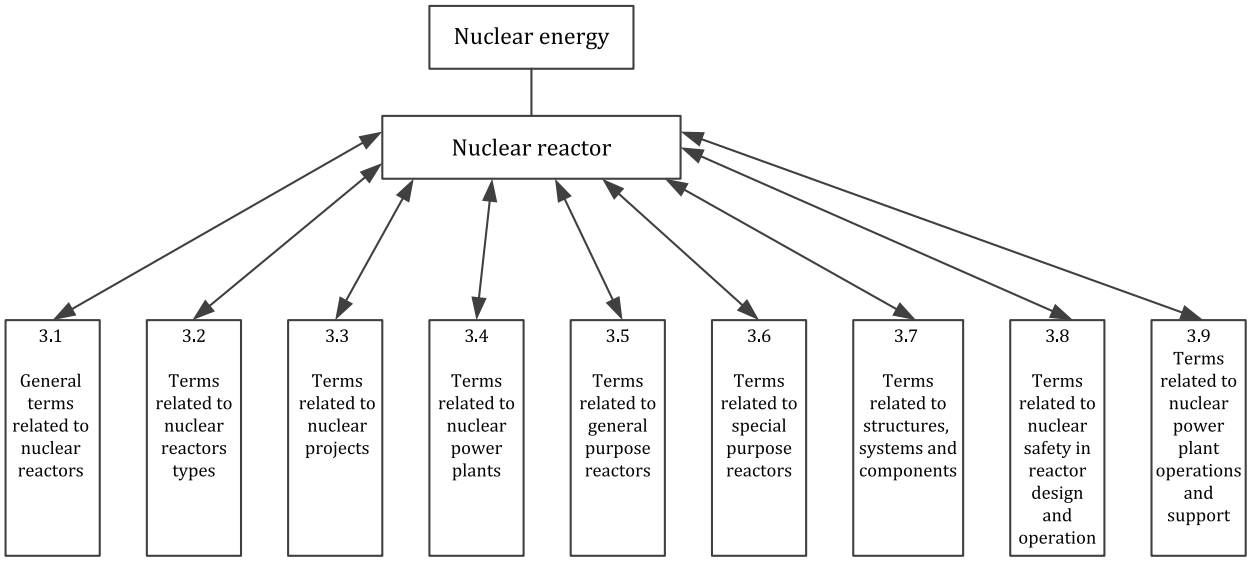
Conceptual arrangement of terms and definitions is based on concepts systems that show corresponding relationships among nuclear reactors concepts. Such arrangement provides users with a structured view of the nuclear energy sector and will facilitate common understanding of all related concepts. Besides, 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.

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 at the end of the standard. The structure of each entry is in accordance with ISO 10241-1. See also Annex A for the methodology used in the development of the vocabulary.

All the terms included in this document deal exclusively with nuclear reactor technology. 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. According to the title, the vocabulary deals with concepts belonging to the general ***nuclear energy*** field within which concepts in the **nuclear reactors** sub-field are taken into account.

Looking for an easier presentation of the required large number of defined concepts, the content of this document has been split into nine headings as shown below, which makes easier any search of terms or relationships between concepts.



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

Part 5: Nuclear reactors

1 Scope

This document encompasses the collection of terms, definitions, notes 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 covers the whole field of nuclear reactors at a broad surface level.

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 terminological databases for use in standardization at the following addresses:

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

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

3.1 General terms related to nuclear reactors

3.1.1
nuclear fission
process by which a nucleus undergoes a partition in two, infrequently in three, main fission fragments, releasing energy

Note 1 to entry: There are two types of nuclear fission: “spontaneous” and “induced” ones.

Note 2 to entry: The nucleus usually has a high mass number A, together with an intermediate or low average-binding-energy-per-nucleon; hence, an inherent instability exists, and the fission fragments are usually highly unstable.

Note 3 to entry: According to their capability for undergoing fission, a nucleus and its associated nuclide can be qualified as fissionable or eventually fissile.

3.1.1.1
induced nuclear fission
nuclear fission (3.1.1) initiated by a nucleus when an external colliding particle is absorbed

Note 1 to entry: The absorption of the external colliding particle, usually a neutron, generates a strong increase in the compound nucleus internal energy and, hence, increases the compound nucleus instability, favouring a large energy release by means of a nucleus partition.