INTERNATIONAL STANDARD

ISO 1709

Third edition
2018-02

Nuclear energy — Fissile materials — Principles of criticality safety in storing, handling and processing

Énergie nucléaire — Matières fissiles — Principes de sûreté-criticité lors des opérations d'entreposage, de manutention et de mise en oeuvre du procédé

Reference number
ISO 1709:2018(E)

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Published in Switzerland

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Foreword

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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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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 Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies and radiological protection*, Subcommittee SC 5, *Nuclear installations, processes and technologies*.

This third edition cancels and replaces the second edition (ISO 1709:1995), which has been technically revised.

A list of all parts in the ISO 1709 series can be found on the ISO website.

Nuclear energy — Fissile materials — Principles of criticality safety in storing, handling and processing

1 Scope

This document specifies the basic principles and limitations which govern operations with fissile materials. It discusses general nuclear criticality safety criteria for equipment design and for the development of operating controls, while providing guidance for the assessment of procedures, equipment, and operations. It does not cover specific quality assurance requirements or details of equipment or operational procedures.

This document does not deal with the issues associated with administrative criteria relating to nuclear criticality safety. These issues are covered by ISO 14943. It does not cover the effects of radiation on man or materials, unless the material properties affect nuclear criticality safety.

These criteria apply to operations with fissile materials outside nuclear reactors but within the boundaries of nuclear establishments. They are concerned with the limitations which are imposed on operations because of the properties of these materials which permit them to support nuclear chain reactions. These principles apply to quantities of fissile nuclides in which nuclear criticality safety is required to be established.

This document can also be applied to the transport of fissile materials outside the boundaries of nuclear establishments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7753, *Nuclear energy — Performance and testing requirements for criticality detection and alarm systems*

ISO 11320, *Nuclear criticality safety — Emergency preparedness and response*

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
critical
having an effective neutron multiplication factor equal to unity

3.2
double batching
unintended increase in the quantity of a material that is controlled for Nuclear Criticality Safety such that twice the intended quantity is present

Note 1 to entry: This typically applies to processes involving discrete quantities of material.