

INTERNATIONAL STANDARD

**ISO
1709**

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

*Énergie nucléaire — Matières fissiles — Principes de sécurité en matière
de criticité lors du stockage, de la manipulation et du traitement*



Reference number
ISO 1709:1995(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 1709 was prepared by Technical Committee ISO/TC 85, *Nuclear energy*, Subcommittee SC 5, *Nuclear fuel technology*.

This second edition cancels and replaces the first edition (ISO 1709:1975), which has been technically revised.

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

1 Scope

This International Standard specifies the basic principles and limitations which govern operations with fissile materials. It discusses general 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 quality assurance requirements or details of equipment or operational procedures, nor does it cover the effects of radiation on man or materials, or sources of such radiation, either natural or as the result of nuclear chain reactions. Transport of fissile materials outside the boundaries of nuclear establishments is not within the scope of this International Standard and should be governed by appropriate national and international standards and regulations.

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 must be imposed on operations because of the unique properties of these materials which permit them to support nuclear chain reactions. These principles apply to quantities of fissile materials in which nuclear criticality can be established.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7753:1987, *Performance requirements and testing procedures for criticality detection and alarm systems*.

3 Procedures

3.1 General

The early recognition of the special hazards associated with fissile materials has led to the application of formal control practices based on principles of criticality safety. Diligent and conscientious application of these principles has produced an accident record which compares favorably with the frequency and severity of common industrial accidents. Continuation and improvement of this generally favorable record requires the cooperation of all those involved in operations.

3.2 Responsibility

Operational responsibility for criticality safety shall be clearly defined and shall belong to operations management throughout the normal chain of command.

3.3 Equipment design

Safety shall, to a practicable extent, be taken into account when designing operating equipment, for example, by restrictions on vessel geometry. The early incorporation of criticality safety considerations into plant design facilitates design and provides economic benefits. Process and equipment design may require approval by the appropriate authority.

Processing controls may be enhanced by the use of appropriate instrumentation.