IAEA SAFETY STANDARDS

IAEA INTERNATIONAL WORKSHOP ON A COMMON FRAMEWORK FOR THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT AND DISPOSAL

CAPE TOWN

2-6 JULY 2007

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SOUTH AFRICA

Overview of the International Safety Standards

- Review the history
- The standards development process
- Current structure of the Safety Standards Series
- Existing and planned new documents
- Application of the standards
- Proposals for the future of the Safety Standards Series

Overview of the International Safety Standards

- **ARTICLE III A.6 OF THE AGENCY STATUTE :**
  - ***"The Agency is authorized to establish or adopt … standards of safety for protection of health and minimization of danger to life."***

- **ARTICLE VIII C OF THE AGENCY STATUTE :**
  - ***"[The Agency] shall take positive steps to encourage the exchange among its members of information relating to the nature and peaceful uses of atomic energy and shall serve as an intermediary among its members for this purpose."***

History

- IAEA involved in management of radioactive waste since 1957.

- Safety Series No. 5 (1961) establishment of safety procedures and practices for the disposal of radioactive waste in the sea.

- Safety Series No. 15 (1965) guidance on disposal in the ground.

History

- **1970's – evident that underground disposal was the internationally accepted approach for most types of solid waste.**
- **1977 – IAEA outlined programme for set of guidance on the subject.**
- **Technical Review Committee on Underground Disposal of Radioactive Waste (1978-1988).**
- **Late 1980's – radioactive waste and its management politically important,**
  - ***One of the technically unresolved issues of nuclear electricity generation.***

History

- **IAEA established the Radioactive Waste Safety Standards (RADWASS) Series –**
  - ***Well established procedures for the safe management of radioactive waste in existence,***
  - ***Ordered structure for the safety documents on waste management,***
  - ***Ensure comprehensive coverage of all relevant subject areas.***

- **Initial RADWASS concept 1988,**

- **International experts elaborated structure, content and scope in 1990,**

- **Development started in 1991.**

History

- **RADWASS programme was amended 1996 –**
  - ***Broaden scope by including discharge control and environmental restoration,***
  - ***Reduce overall number of documents by combining several planned guides.***

- **RADWASS Documents categorised**
  - **Discharges**
  - **Predisposal**
  - **Disposal**
  - **Environmental Restoration**

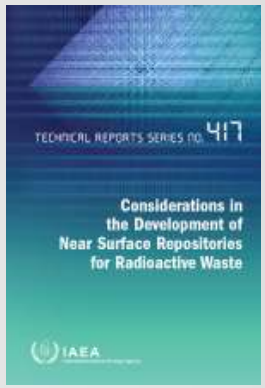
History

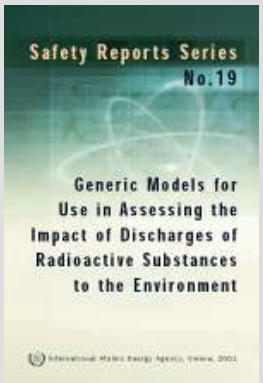
- **IAEA Safety Standards Series as a whole was restructured in 2003 –**
  - ***Improving coherence and Integration of standards in all areas of nuclear, radiation, radioactive waste and transport safety,***
  - ***Document existing international consensus,***
  - ***Create a mechanism to establish consensus where it did not exit,***
  - ***Provide IAEA Member States with a comprehensive series of internationally agreed publications to complement national standards and criteria.***

Structure of the Safety Standards

- **The safety standards series comprises three levels of documents:**
  - **Safety Fundamentals**
  - **Safety Requirements**
  - **Safety Guides**

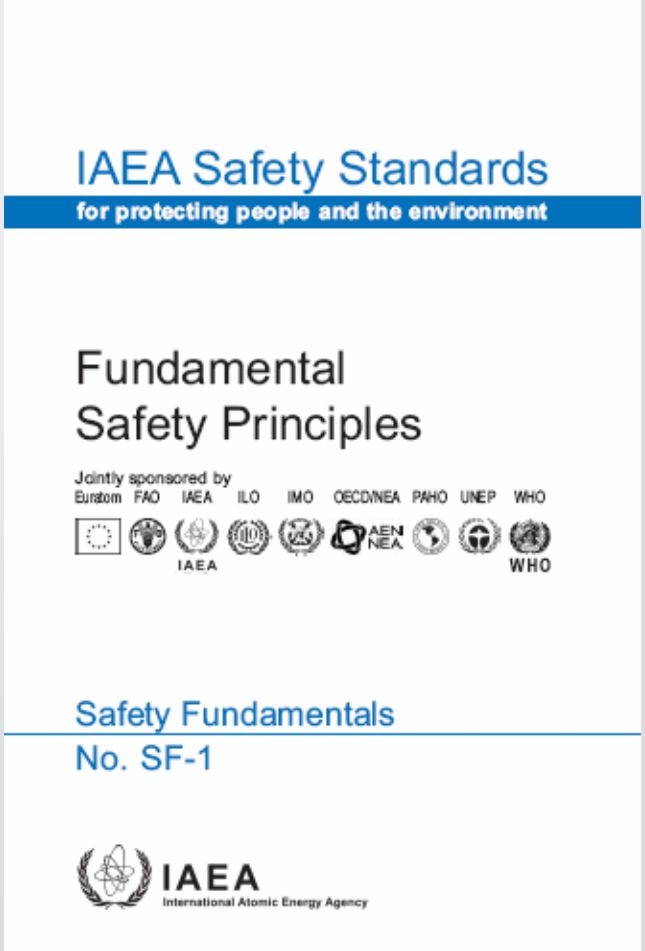
  - **Cf. Supporting documents**
    - **Safety Reports**
    - **Technical Reports**
    - **TECDOCs**





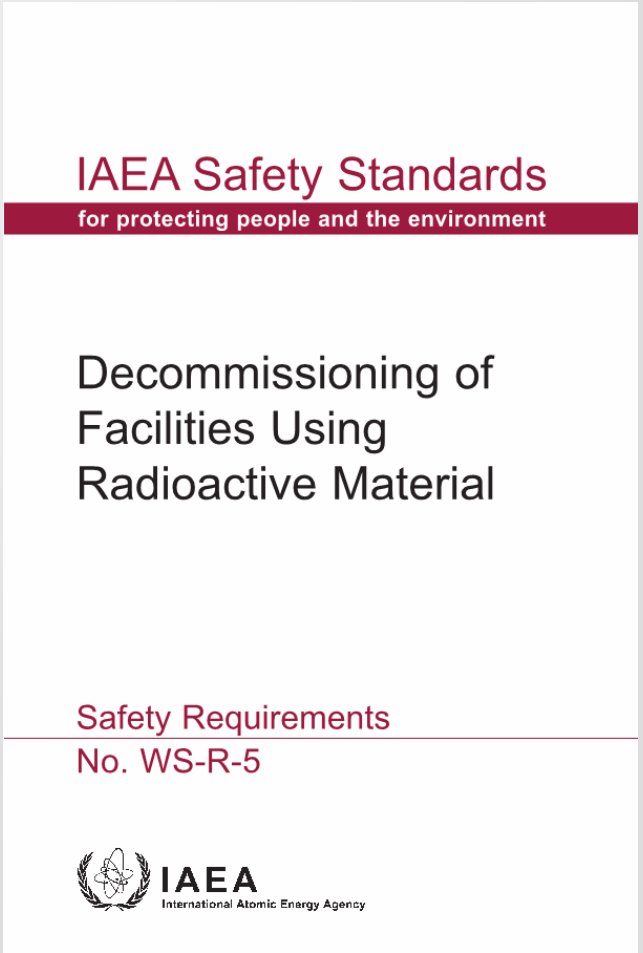
Safety Fundamentals

- **"Policy documents" of the IAEA Safety Standards Series:**
  - **State the basic objectives, concepts and principles involved in ensuring protection and safety;**
  - **Provide the rationale for actions necessary in meeting safety requirements;**
  - **Do not provide technical details nor go into the application of principles.**



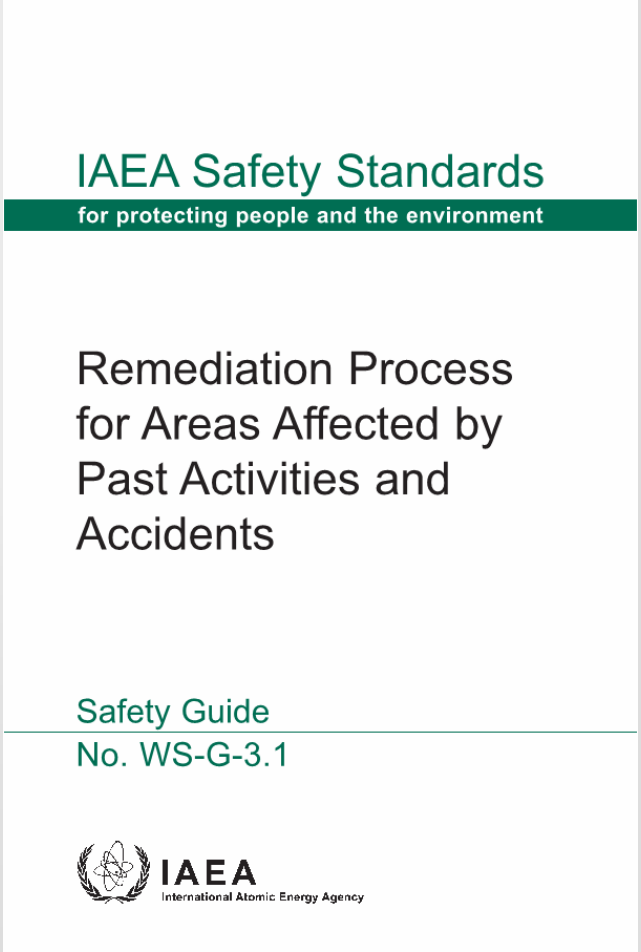
Safety Requirements

- **Basic requirements which must be met in order to ensure the safety of particular activities. The requirements are:**
  - **governed by the basic objectives, concepts and principles presented in the safety fundamentals document;**
  - **written with "shall" statements.**
- **They may be used a basis for national regulations**



Safety Guides

- **Contain recommendations on how to meet requirements. They:**
  - **use “should” statements;**
  - **are based on international experience, regarding measures to ensure that the safety requirements are met.**


IAEA Safety Standards

for protecting people and the environment

Remediation Process for Areas Affected by Past Activities and Accidents

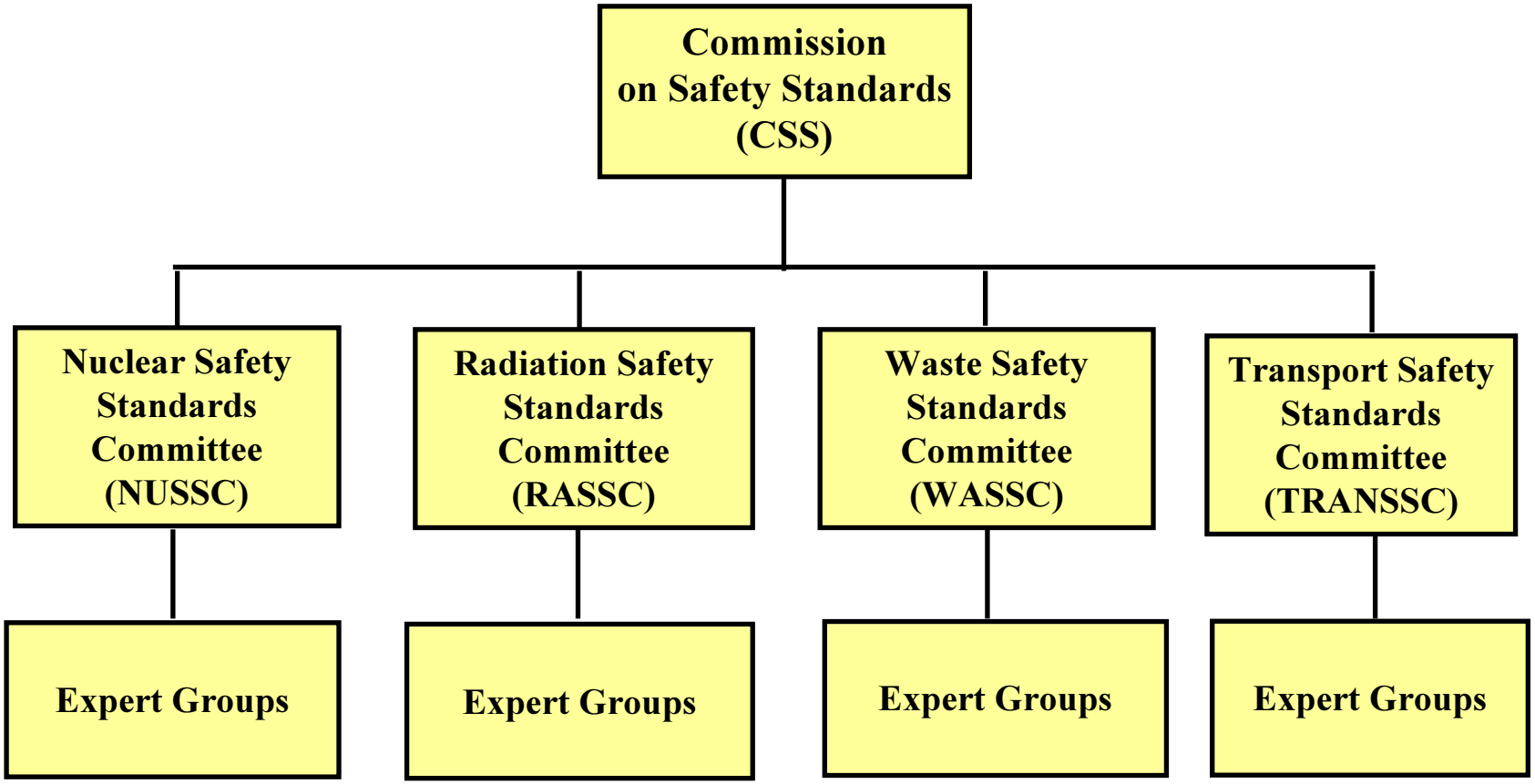
Safety Guide

No. WS-G-3.1

IAEA

International Atomic Energy Agency

Commission and Committees



CSS

- **Standing body of senior government officials holding national responsibilities for establishing standards and other regulatory documents relevant to nuclear, radiation, transport and waste safety**
  - *To have overview of the IAEA safety standards*
  - *To ensure coherence and consistency between standards;*
  - *To endorse, the texts of –*
    - ***Safety Fundamentals and Safety Requirements to be submitted to the Board of Governors for approval, and***
    - ***Safety Guides to be issued under the authority of the Director General.***

WASSC

- **Standing body of senior regulatory officials with technical expertise in radioactive waste safety.**

- **Responsibilities –**
  - ***To have overview of radioactive waste safety programme and advise the secretariat on the regulatory aspects of radioactive waste safety;***
  - ***To recommend the Terms of Reference of all waste safety standards in order to promote coherence and consistency among the standards and between them and the other safety related publications of the agency;***

WASSC

- **Responsibilities (cont'd):**
  - ***To agree on the texts of Safety Fundamentals, Requirements and Guides and to make recommendations to the CSS;***
  - ***To provide advice and guidance on a continuous programme for reviewing and revising the agency's radioactive waste safety standards;***
  - ***To identify and advise on any necessary activities in support of the radioactive waste safety programme.***

WASSC 23
10 – 13 April 2007

Standards Development Process

- **Document Preparation Profile (DPP)**
  - **Approved by the committees and CSS before work can start**
  - **Justifies the development of a standard**
  - **includes**
    - ***a preliminary table of contents,***
    - ***a listing of interfaces with other standards,***
    - ***a time schedule for the document preparation, and***
    - ***for cross-cutting documents, a prescription for the involvement committees other than the one with the main responsibility for developing the document.***

Standards Development Process

- IAEA Secretariat drafts the safety standard with the help of experts from Member States.
- Submitted to the relevant Safety Standards Committee(s) for approval for it to be sent to Member States for comment.
- Member States are given four months to comment.
- Comments are considered by the Secretariat and are, if appropriate and justified, incorporated into a revised draft.
- The revised draft is then submitted again to the committees involved, for approval to send it to the Commission on Safety Standards (CSS).

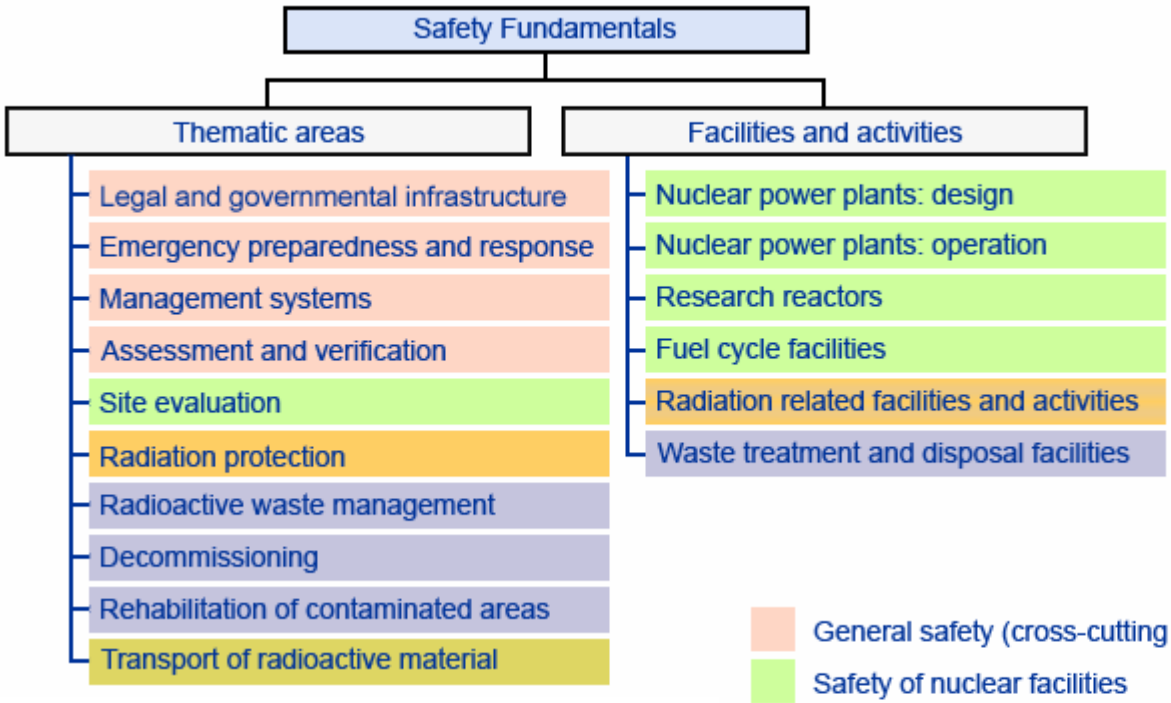
Standards Development Process

- Approval by the CSS,

- Safety Fundamentals and the Safety Requirements, require the formal approval of the IAEA Board of Governors as a final step before publication.

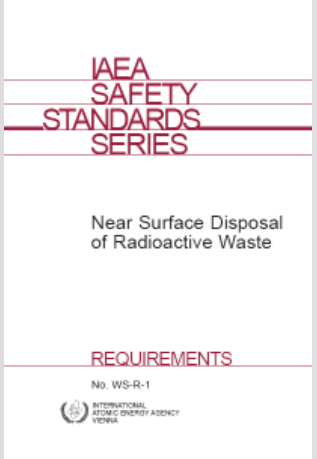
- Safety Guides can be published without this step, after CSS approval, under the authority of the IAEA Director General.

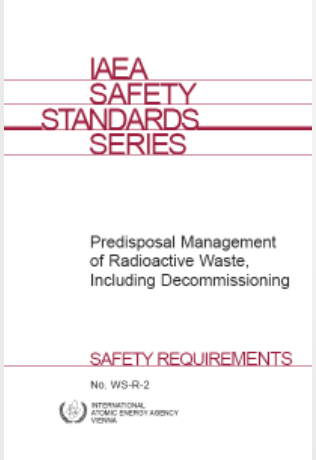
Overall Structure of Safety Standards

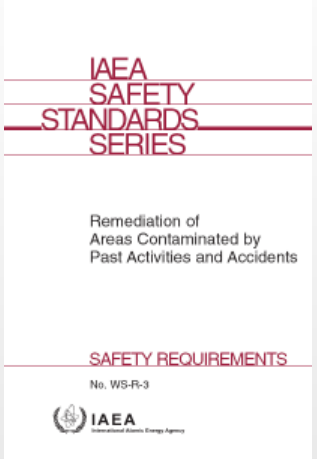


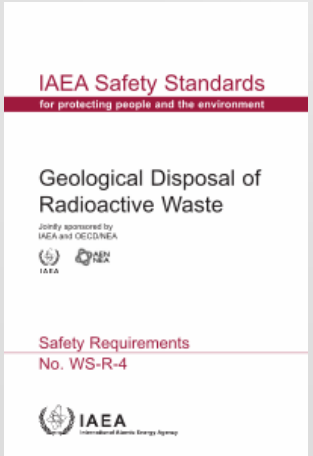
- General safety (cross-cutting themes)
- Safety of nuclear facilities
- Radiation protection and safety of radiation sources
- Safe management of radioactive waste
- Safe transport of radioactive material

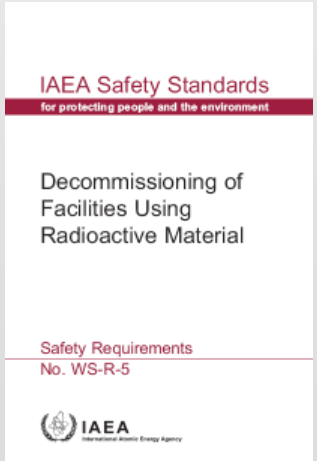
Current Requirements



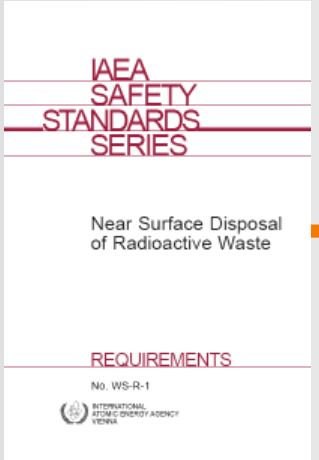


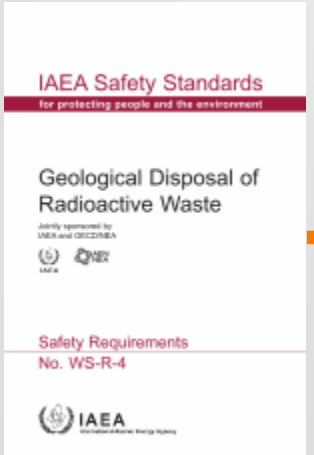


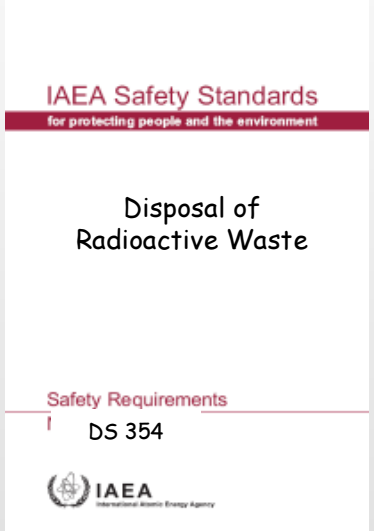




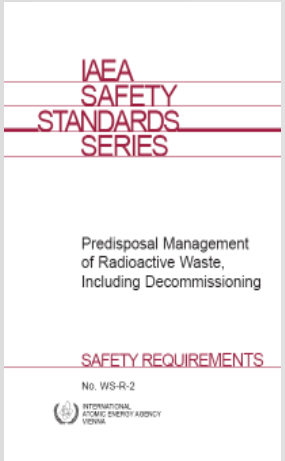
Planned Requirements

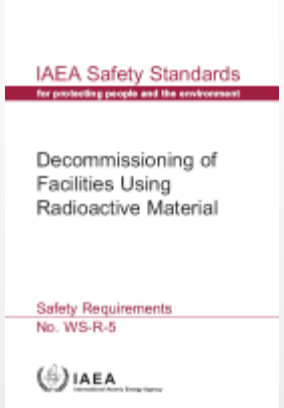


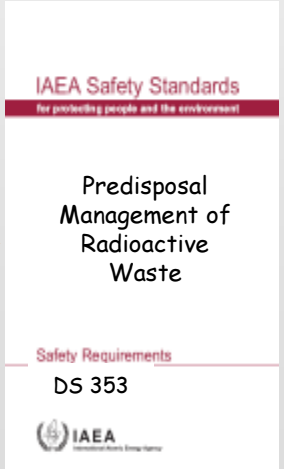




Planned Requirements







Planned Requirements

IAEA Safety Standards
for protecting people and the environment

Predisposal Management of Radioactive Waste

Safety Requirements
DS 353

IAEA

IAEA Safety Standards
for protecting people and the environment

Disposal of Radioactive Waste

Safety Requirements
DS 354

IAEA

IAEA Safety Standards
for protecting people and the environment

Decommissioning of Facilities Using Radioactive Material

Safety Requirements
No. WS-R-5

IAEA

IAEA SAFETY STANDARDS SERIES

Remediation of Areas Contaminated by Past Activities and Accidents

SAFETY REQUIREMENTS
No. WS-R-3

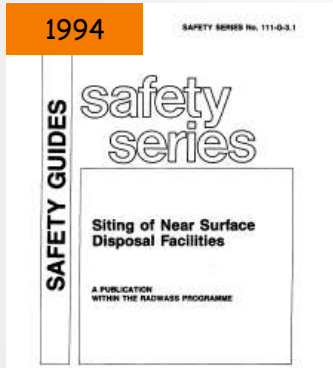
IAEA

Current and Planned Guides

1994

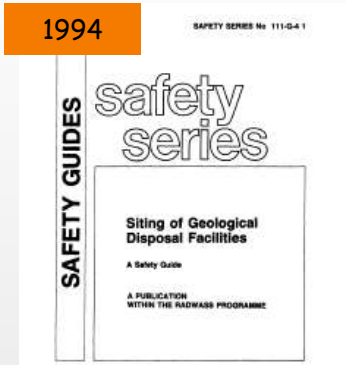
To be superseded by DS 390

1994



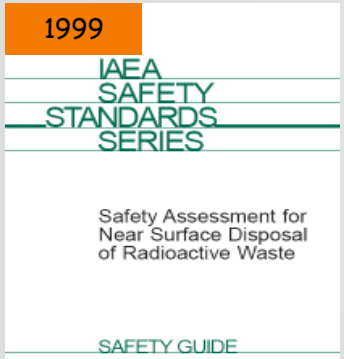
To be superseded by DS356

1994



To be superseded by DS334

1999



To be superseded by DS 355

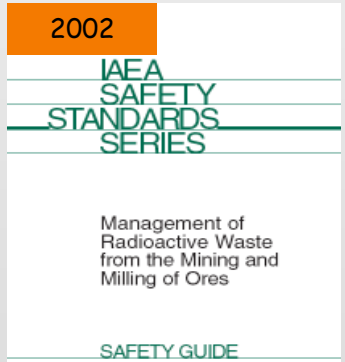
1999

To be superseded by DS402

1999

To be superseded by DS 403

2002



To be superseded by DS352

Current and Planned Guides

2000

IAEA SAFETY STANDARDS SERIES

REGULATORY CONTROL OF RADIOACTIVE DISCHARGES TO THE ENVIRONMENT

SAFETY GUIDE

No. WS-G-2.3

INTERNATIONAL ATOMIC ENERGY AGENCY VIENNA

2003

IAEA SAFETY STANDARDS SERIES

Predisposal Management of Low and Intermediate Level Radioactive Waste

SAFETY GUIDE

No. WS-G-2.5

INTERNATIONAL ATOMIC ENERGY AGENCY VIENNA

2003

IAEA SAFETY STANDARDS SERIES

Predisposal Management of High Level Radioactive Waste

SAFETY GUIDE

No. WS-G-2.6

INTERNATIONAL ATOMIC ENERGY AGENCY VIENNA

2004

IAEA SAFETY STANDARDS SERIES

Application of the Concepts of Exclusion, Exemption and Clearance

SAFETY GUIDE

No. RS-G-1.7

IAEA

2005

IAEA Safety Standards

for protecting people and the environment

Environmental and Source Monitoring for Purposes of Radiation Protection

Safety Guide

No. RS-G-1.8

IAEA

2005

IAEA Safety Standards

for protecting people and the environment

Management of Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education

Safety Guide

No. WS-G-2.7

IAEA

2006

IAEA Safety Standards

for protecting people and the environment

Storage of Radioactive Waste

Safety Guide

No. WS-G-6.1

IAEA

2006

IAEA Safety Standards

for protecting people and the environment

Release of Sites from Regulatory Control on Termination of Practices

Safety Guide

No. WS-G-5.1

IAEA

2007

IAEA Safety Standards

for protecting people and the environment

Remediation Process for Areas Affected by Past Activities and Accidents

Safety Guide

No. WS-G-3.1

IAEA

Planned Guides

2001

IAEA SAFETY STANDARDS SERIES

Decommissioning of Nuclear Fuel Cycle Facilities

SAFETY GUIDE

No. WS-G-2.4

INTERNATIONAL ATOMIC ENERGY AGENCY VIENNA

IAEA SAFETY STANDARDS SERIES

Safety Assessment for Decommissioning of Nuclear Facilities

SAFETY GUIDE

DS 376

IAEA SAFETY STANDARDS SERIES

Decommissioning of Nuclear Fuel Cycle Facilities

SAFETY GUIDE

DS 404

Planned Guides

2003

IAEA SAFETY STANDARDS SERIES

Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants

SAFETY GUIDE

No. NS-G-2.7

INTERNATIONAL ATOMIC ENERGY AGENCY VIENNA

2005

IAEA Safety Standards

for protecting people and the environment

Radiation Protection Aspects of Design for Nuclear Power Plants

Safety Guide

No. NS-G-1.13

IAEA

IAEA Safety Standards

for protecting people and the environment

Radiation Protection and Radioactive Waste Management in the Design and Operation of Nuclear Power Plants

Safety Guide

DS 340

IAEA

Planned Guides

IAEA Safety Standards
for protecting people and the environment

Safety Assessment for Nuclear and radiation Facilities other than Reactors and Waste Repositories

Safety Guide
DS 284
IAEA

IAEA Safety Standards
for protecting people and the environment

Borehole Facilities for Disposal of Radioactive Waste

Safety Guide
DS 335
IAEA

IAEA Safety Standards
for protecting people and the environment

Management systems for the Treatment, Handling and Storage of Radioactive Waste

Safety Guide
DS 336
IAEA

IAEA Safety Standards
for protecting people and the environment

Management systems for the Safety of Radioactive Waste Disposal Facilities and Activities

Safety Guide
DS 337
IAEA

IAEA Safety Standards
for protecting people and the environment

Monitoring and Surveillance of Disposal Facilities

Safety Guide
DS 357
IAEA

IAEA Safety Standards
for protecting people and the environment

Storage of Spent Fuel

Safety Guide
DS 371
IAEA

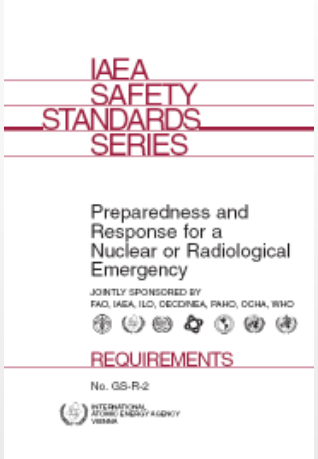
IAEA Safety Standards
for protecting people and the environment

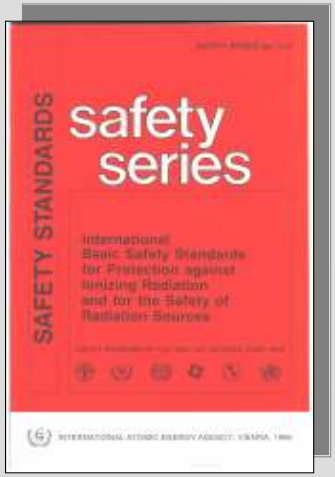
Criticality Safety

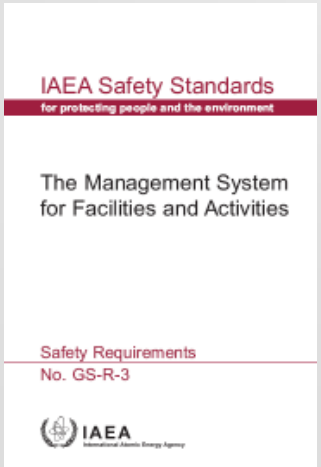
Safety Guide
DS 407
IAEA

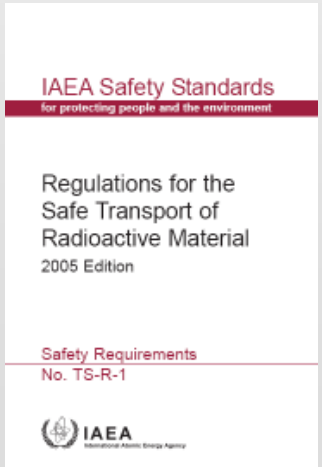
SUITE OF STANDARDS

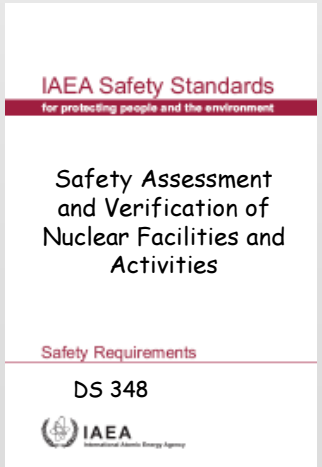
- Safety Fundamentals
- 4 Requirements level documents
- 27 Safety Guides

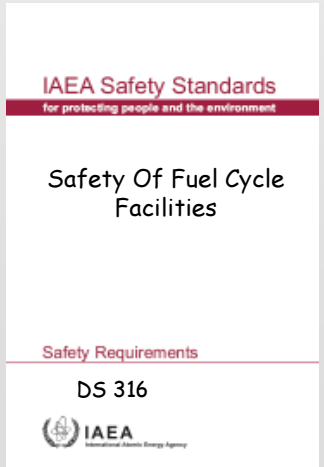












APPLICATION OF THE STANDARDS

- **The IAEA statute**
  - ***Safety Standards are binding on the IAEA in relation to its own operations and on States in relation to operations assisted by the IAEA.***
  - ***Any State wishing to enter into an agreement with the IAEA concerning any form of IAEA assistance is required to comply with the requirements of the Safety Standards that pertain to the activities covered by the agreement.***

- **International conventions contain similar requirements to those in the Safety Standards and make them binding on the Contracting Parties**
  - ***The Safety Fundamentals for Nuclear Safety were used as the basis for the development of the Convention on Nuclear Safety and***
  - ***The Safety Fundamentals for Waste Safety were used as the basis for the Joint Convention.***

APPLICATION OF THE STANDARDS

- **Safety Standards are not themselves legally binding,**
  - ***States may use the standards for the establishment of a national regulatory framework, i.e. as a basis for regulations.***

- **It should be noted that the Safety Standards are intended to apply primarily to new facilities and activities.**
  - ***The requirements and recommendations specified in the IAEA Safety Standards might not be fully met at some facilities built to earlier standards,***
  - ***matter for individual States to decide upon.***

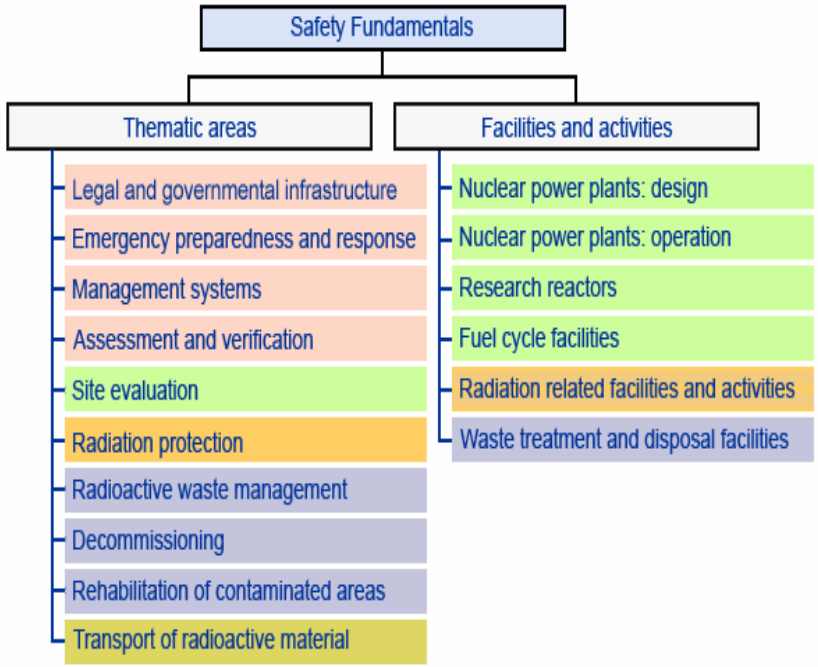
Future of the Safety Standards Series

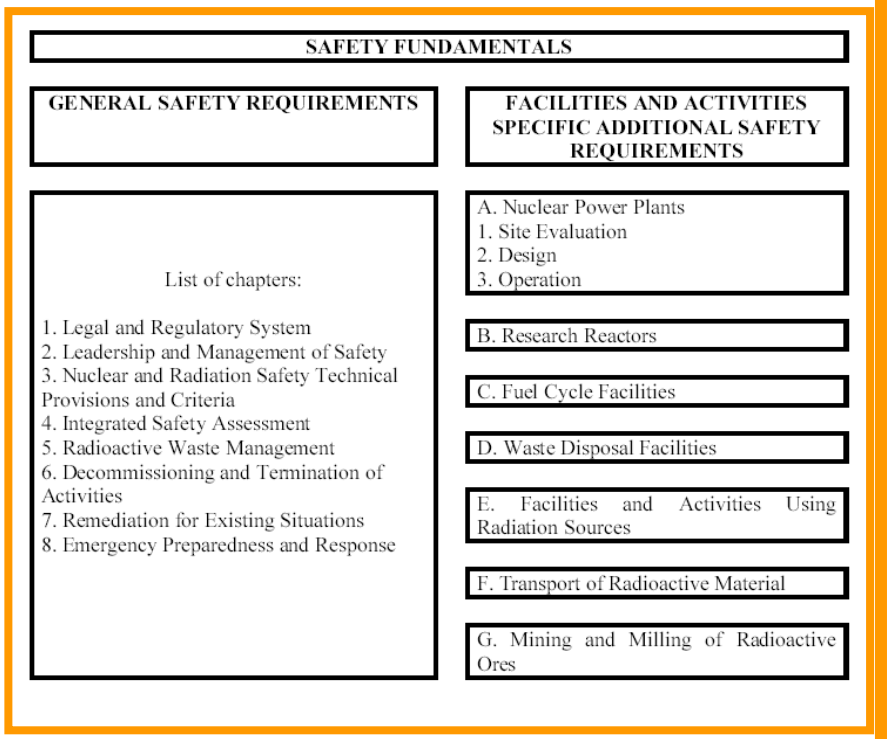
- The intention is to publish by 2013 in a single volume generic safety requirements for all thematic areas

- Will be complemented by a set of seven Facilities and Activities Specific Safety Requirements to be published by 2015.

- The General Safety Requirements apply everywhere, whereas the others apply for specific facilities or activities.

Future of the Safety Standards Series





Future of the Safety Standards Series

- **It is based on the following considerations –**
  - ***The new structure derives from the existing one;***
  - ***One of the objectives is to apply for the Safety Requirements the approach adopted for the Safety Fundamentals document, i.e. harmonization and integration of all areas (nuclear safety, radiation safety, transport safety and safety of radioactive waste management);***
  - ***The set of General Safety Requirements should implement all of the safety principles from the publication SF-1 in a top-down approach;***
  - ***The new structure proposed is based on a user friendly approach such that the regulators and operators of different types of Facilities and Activities can easily identify which publications apply to their activities;***

Future of the Safety Standards Series

- *With a view to limiting the burden to the Secretariat, the members of the Committees, the Commission and the Member States as well as ensuring stability in the set of Safety Requirements, the new structure can be established on the basis of recently published Safety Standards and those in development.*

- *The numbering system for the final series will be as follows:*
  - *SF-1 for the existing Fundamental Safety Principles;*
  - *SR-1 to SR 8, in sequence for the set of Safety Requirements.*

FORMAT FOR THE FUTURE SET OF SAFETY REQUIREMENTS

- **Proposed to adopt for all Safety Requirements format similar to the one used for the Fundamental Safety Principles**
  - ***discrete set of requirements followed by explanatory text.***
  - ***It is expected that the level of detail in each chapter will be similar.***
  - ***Each individual discrete requirement will be allocated a number which, by appropriate references in the Safety Guides, will help in building a logical relationship between the set of safety requirements and the set of safety guides.***
  - ***Thus, after completion of the set of Safety Requirements, the subsequent revision of Safety Guides will refer to these numbers.***

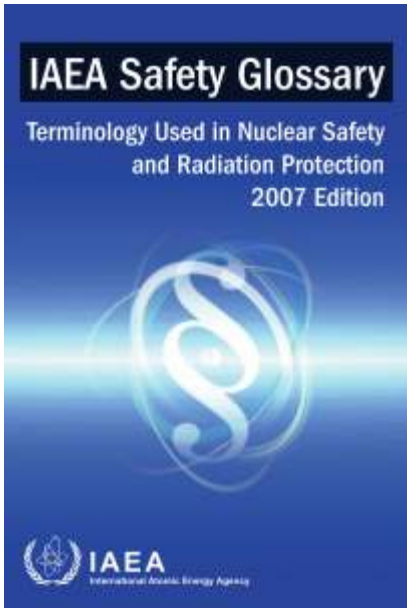
A two step process is proposed

- **Step 1, 2007-2009,**
  - ***Completion of safety requirements already in preparation and those that urgently need to be reviewed/revised.***
  - ***This will be done having in mind the final objective of later integration by 2013 of the present set of thematic requirements in one document.***
- **Step 2, 2010-2015,**
  - ***Final integration by 2013 of the General Safety Requirements and***
  - ***Finalization of the Facilities and Activities specific Safety Requirements.***

Availability of the Safety Standards

– **Web page for all IAEA publications**

http://www-pub.iaea.org/MTCD/publications/Search.asp

– **Web page for Safety Standards**

http://www-ns.iaea.org/standards/