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International Atomic Energy Agency
Atoms for Peace and Development

European ALARA Network Workshop n°18
(jointly organized with ISOE)

ALARA for decommissioning and site remediation

11 - 13 March 2019
Marcoule Nuclear Research Centre,
F-30207 Bagnols sur Cèze, FRANCE

IAEA Safety standards for decommissioning and remediation, and their application

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Thematic Areas of IAEA Safety Standards addressed by NSRW

Division of
Radiation
Transport and
Waste Safety
(NSRW)

Waste and
Environmental
Safety Section
(WES)

Safety standards for:

- Radioactive waste and spent fuel (disposal and predisposal).
- Decommissioning and Remediation.
- Uranium and NORM residues.
- Environ assessment and monitoring.

Radiation
Safety and
Monitoring
Section (RSM)

Safety standards for:

- Basic Safety Standards for RP (BSS)
- Occupational radiation protection and monitoring
- Protection of patients
- Safety of sources
- Radon

Regulatory
Infrastructure
and Transport
Safety Section
(RIT)

Safety standards for:

- Transport safety
- Regulatory infrastructure



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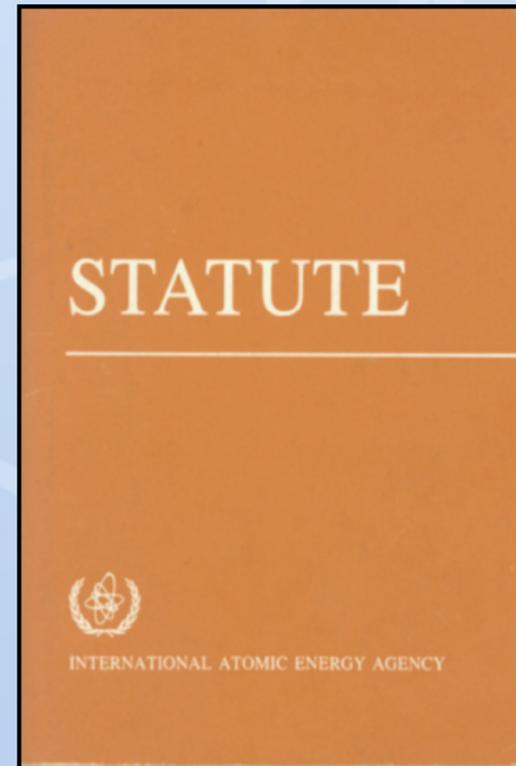
IAEA STATUTORY OBLIGATIONS (1957)

Article III, *Functions* Paragraph A.6.

“To **establish or adopt**, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned,

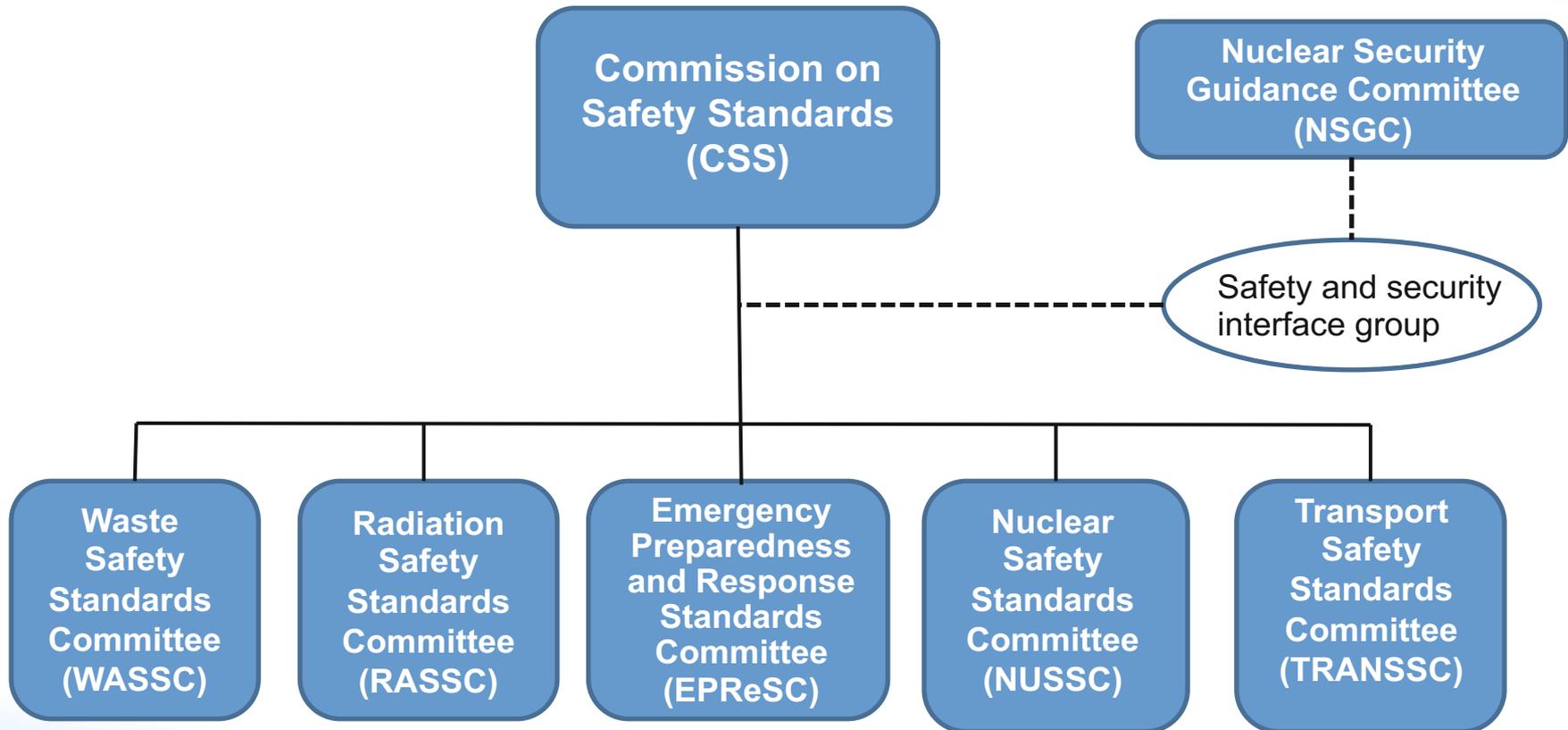
standards of safety for protection of health and minimization of danger to life and property (including such standards for labour conditions), and

to provide for the application of these standards to its own operation as well as to the operations making use of materials, services, equipment, facilities, and information made available by the Agency ...; “



The Commission and Committees for Safety Standards Development

One commission and five safety standards committees oversee the development and approval of the IAEA safety standards.



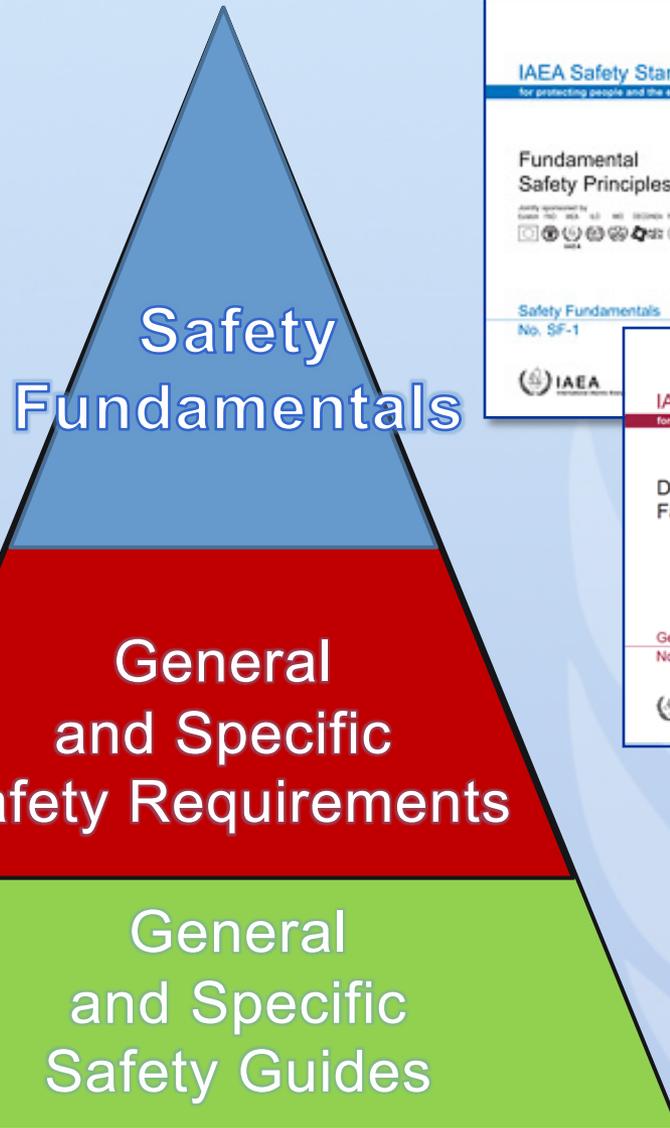
Member States nominate the committee members.



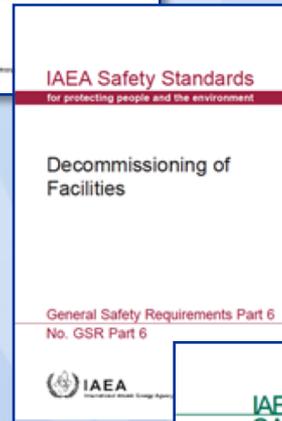
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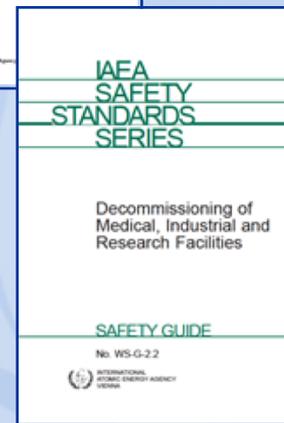
Safety Standards – Hierarchy & Categories



Fundamental Safety Principles



Safety Requirements – legal, technical, & procedural safety imperatives



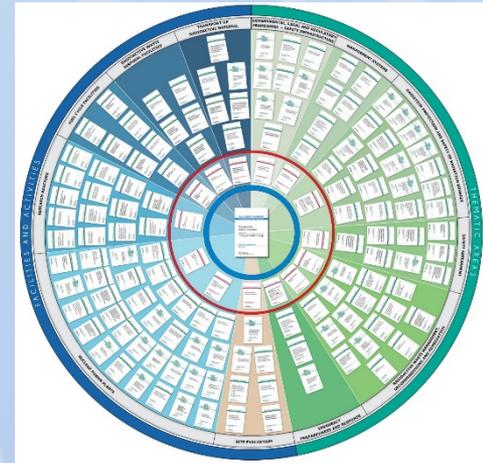
Safety Guides, best practice to meet Requirements

Legal Nature of IAEA Safety Standards

IAEA Safety standards are

- Binding for IAEA's own activities
- Not binding on the Member States (but may be adopted by them) EXCEPT in relation to operations assisted by the IAEA e.g.:
 - Integrated Regulatory Review Service
 - Technical Cooperation Fund activities
 - States wishing to enter into project agreements with the IAEA

<http://www-ns.iaea.org/standards/default.asp>





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SAFETY FUNDAMENTALS
Fundamental Safety Principles

GENERAL SAFETY REQUIREMENTS

**Part 1, Governmental and
Regulatory Framework**

**Part 2, Leadership and Management
For Safety**

**Part 3, Radiation protection and
Safety of Radiation Sources**

Part 4, Safety Assessment

**Part 5, Predisposal Management of
Radioactive Waste**

**Part 6, Decommissioning and
Termination of Activities**

**Part 7, Emergency Preparedness
and Response**

SPECIFIC SAFETY REQUIREMENTS

**1. Site Evaluation for
Nuclear Installations**

2. Safety of Nuclear Power Plants
2.1. Design and Construction
2.2. Commissioning and Operation

3. Safety of Research Reactors

**4. Safety of Nuclear Fuel Cycle
Facilities**

**5. Safety of Radioactive Waste
Disposal Facilities**

**6. Safe Transport of Radioactive
Material**

Collection of SAFETY GUIDES



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Decommissioning

IAEA Safety Standards
for protecting people and the environment

Safety Assessment for the Decommissioning of Facilities Using Radioactive Material

Safety Guide
No. WS-G-5.2



IAEA Safety Standards
for protecting people and the environment

Decommissioning of Facilities

General Safety Requirements Part 6
No. GSR Part 6



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 Safety Standards
for protecting people and the environment

Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

Specific Safety Guide
No. SSG-47



SSG 49

IAEA SAFETY STANDARDS SERIES

Decommissioning of Medical, Industrial and Research Facilities

SAFETY GUIDE
No. WS-G-2.2



DS 500

IAEA SAFETY STANDARDS SERIES

Application of the Concept of Clearance

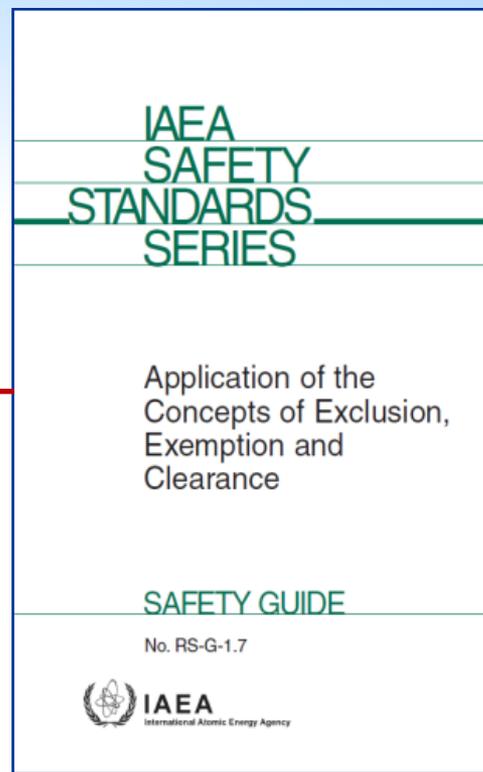
SAFETY GUIDE
No. RS-G-1.7



New Safety Guide on Implementation of the Concept of Clearance



- Increased importance of clearance with more intense decommissioning works worldwide
- Existing guide “**Application of the Concepts of Exclusion, Exemption and Clearance**”, IAEA Safety Standards Series No RS-G-1.7 (2004).
 - Based on Safety Requirements and Safety Fundamentals from 1996 and earlier.
 - Much information from RS-G-1.7 is now incorporated into IAEA Safety Standards Series No GSR Part 3 (2014).
- GSR Part 3 provides requirements related to exemption and clearance, but does not expand upon the application of the concepts of exemption and clearance
- Guidance is needed to address requirements of GSR Part 3



(2004)

**New Safety Guide on Application
of the Concept of Clearance
(DS500)**
WASSC, RASSC, TRANSSC

**New Safety Guide on Application
of the Concept of Exemption
(DS499)**
• RASSC, WASSC

To be developed in parallel

New Safety Guide on Implementation of the Concept of Clearance



DS500 will provide guidance on:

- Clearance process;
- Establishment of national regulations related to clearance;
- Planning, organization and implementation of clearance;
- Technical and safety implications;
- Resources needed to implement the clearance process;
- Derivation of surface specific clearance levels;
- Conditional clearance;
- Aspects related to clearance of liquids and gases;
- Clearance in the context of existing exposure situations;
- Involvement of interested parties.



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Remediation and NORM Residues Management

DS 468

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

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To be submitted to
WASSC in June
2019 for review

IAEA Safety Standards
for protecting people and the environment

**Radiation Protection and
Safety of Radiation Sources:
International Basic
Safety Standards**

Jointly sponsored by
EC, FAO, IAEA, ILO, OECD/NEA, PAHO, UNEP, WHO



**General Safety Requirements Part 3
No. GSR Part 3**

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DS 459

**IAEA
SAFETY
STANDARDS
SERIES**

**Management of Residues
Containing Naturally
Occurring Radioactive
Material from Uranium
Production and Other
Activities**

SAFETY GUIDE
No. WS-G-1.2

 **INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA**

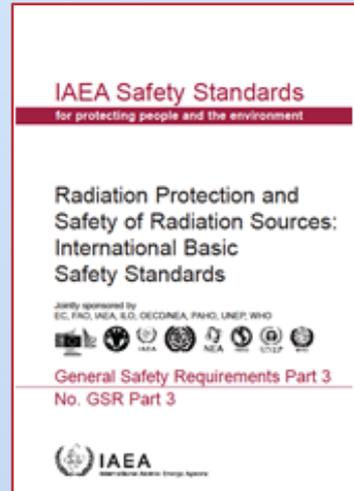
To be submitted to
CSS for approval in
April 2019.



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Safety Standards on Environmental Releases



Recently published

DS 505

IAEA Safety Standards

**Source Monitoring,
Environmental Monitoring
and Individual Monitoring
for Protection of the
Public and the
Environment**

Safety Guide
No. RS-G-1.8



IAEA Safety Standards
for protecting people and the environment

Prospective Radiological
Environmental Impact
Assessment for
Facilities and Activities



General Safety Guide
No. GSG-10



IAEA Safety Standards
for protecting people and the environment

Regulatory Control
of Radioactive Discharges
to the Environment



General Safety Guide
No. GSG-9



IAEA Safety Standards
for protecting people and the environment

Radiation Protection
of the Public and
the Environment



General Safety Guide
No. GSG-8



Technical meeting to share international experience on protection of the public and the environment 1-5 April 2019



The objectives of the event are:

- to share knowledge and experience on international practices with regard to implementation of the IAEA requirements for the protection of the public and environment from ionizing radiation
- to promote the three new Safety Guides
 - GSG-8 Radiation Protection of the Public and the Environment,
 - GSG-9 Regulatory Control of Discharges to the Environment
 - & GSG-10 Prospective Radiological Environmental Impact Assessment for Facilities and Activities
- to discuss at the general level the methods used to apply the principles of optimization of the protection and application of dose limits

Member States are invited to present following case studies:

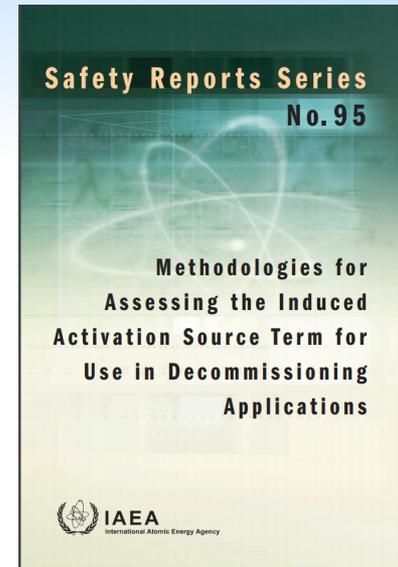
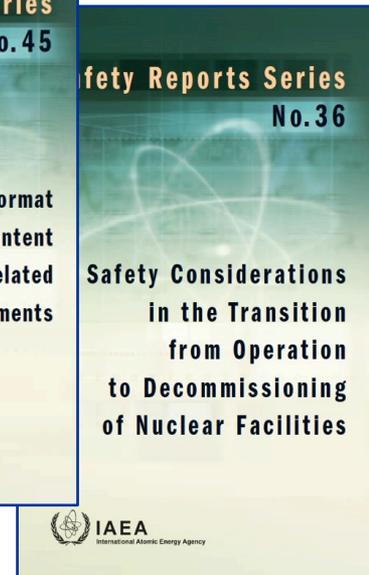
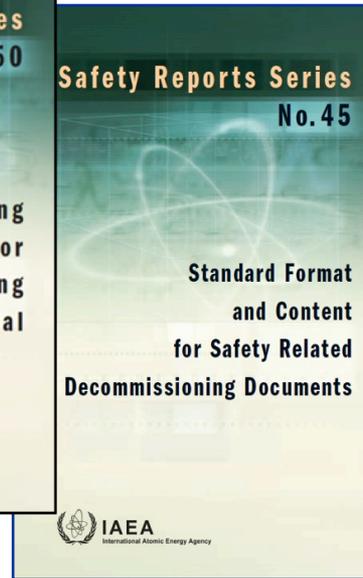
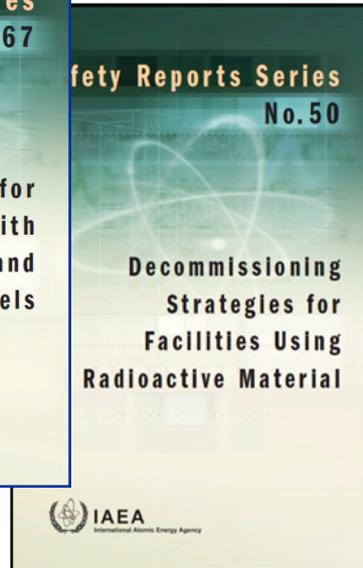
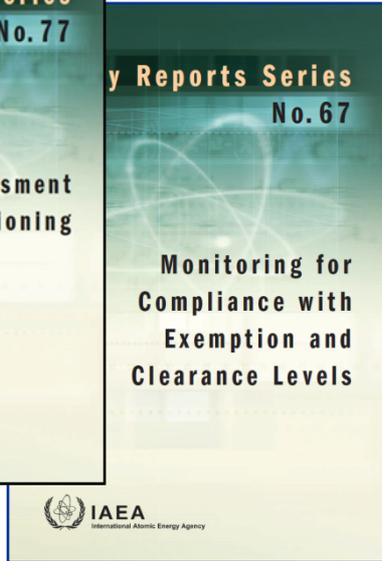
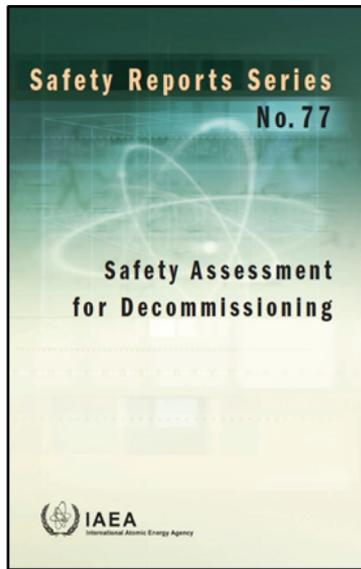
- (a) National examples of implementing the requirements for protection of the public and the environment into national legal and regulatory frameworks
- (b) A summary of national approaches to protecting the public and the environment from ionizing radiation, including input data, assessment methods and criteria

Target audience: ministries, regulatory bodies, operators

IAEA Safety Reports - Decommissioning



New! 2019



Revision of Decommissioning Safety Reports



The first IAEA SRS publications date from the mid-2000s to present. Developed following the completion of the first set of decommissioning safety standards.

The first major revision of the body of decommissioning safety standards is near completion. Correspondingly, we are beginning to revise the decommissioning publications in the Safety Reports Series.

IAEA Technical Meeting for the revision of Safety Reports Series No. 50 “***Decommissioning Strategies for Facilities Using Radioactive Material***” to be held at the IAEA’s HQ Vienna, 27 to 31 May 2019.

Model Regulations for Decommissioning (2017)

Many States are currently faced with the decommissioning of ageing facilities at the end of their life or already shut down.

In some cases, decommissioning activities are only starting to be considered (or not considered at all) in the national legal and regulatory framework for protection and safety.

This publication provides information on an appropriate set of regulations covering all aspects of decommissioning.



International Projects - Decommissioning



MIRDEC:

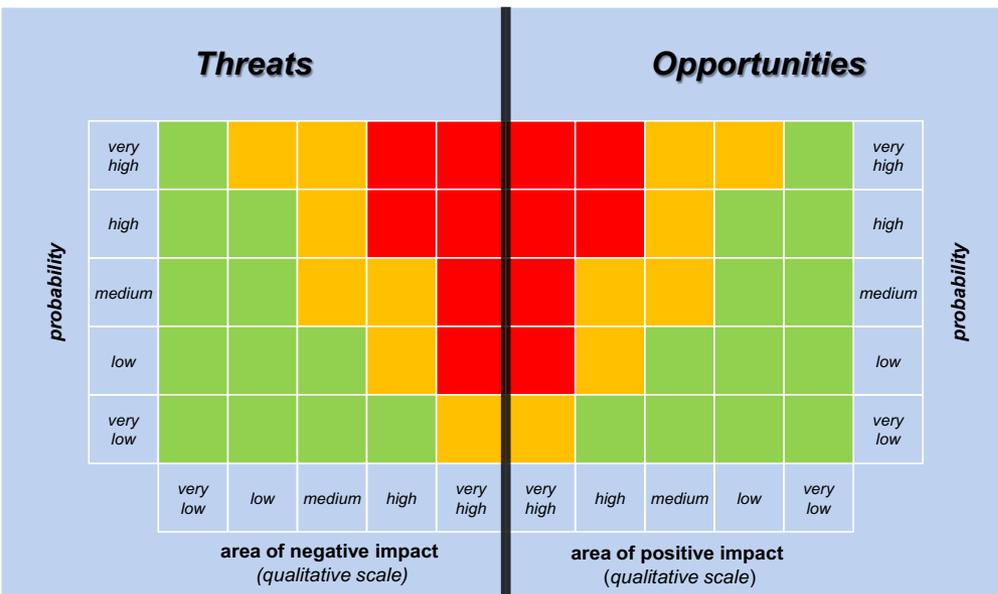
- International Project on Decommissioning of Medical, Industrial and Research Facilities – launched in 2018.
- A platform to promote new Safety Guide SSG-49, *Decommissioning of Medical, Industrial and Research Facilities*.
- *Second MIRDEC TM planned for 1-5 July 2019 in Vienna.*

COMDEC:

- International Project on Completion of Decommissioning – launched in 2018.
- Gather experiences worldwide pertaining to decommissioning end state, controls after completion of decommissioning (when needed) and release of sites from regulatory control. Will inform revision of WS-G-5.1.
- Second COMDEC TM planned for **23-27 Sept 2019**.

International Cooperation: Projects and Communities of Practice

- R2D2 - Research Reactor Decommissioning Demonstration
- DRiMa - Decommissioning Risk Management
- DAROD - Decommissioning and Remediation of Damaged Nuclear Facilities



Revision of existing and development of new training materials for decommissioning safety



- Timeframe 2016-2020, EB funds from Japan
- Modules under revision / development:
 - Basic Training Course on the Safe Decommissioning of Facilities
 - Specialized Training Module on Regulatory Control of the Decommissioning of Facilities
 - Specialized Training Module on Characterization to Support Decommissioning
 - Specialized Training Module on Decommissioning Planning and Project Management
 - Specialized Training Module on Safety Assessment for the Decommissioning of Facilities
- Potential additional modules (subject to availability of funds):
 - Specialized Training Module on Management of Waste and Material from Decommissioning
 - Specialized Training Module on Final Survey and Release of Sites from Regulatory Control

Activities related to NORM residues management.



REGSUN: Regulatory Forum for Safety of Uranium Production and Management of Naturally Occurring Radioactive Materials.

- Builds capacity in Member States undertaking or considering uranium production or the management of NORM residues.
- Promote good regulation and safe and environmentally responsible practices, through the application of IAEA Safety Standards.

Application of Graded Approach for Regulatory Control of NORM Residues (draft TECDOC):

- Supports application of GSR Part 3 (BSS) and DS459 in regard to graded approach for management of NORM activities;
- Approaches for regulatory control of NORM activities that are commensurate with risk.

Meetings:

- Annual REGSUN Meeting 10-14 June 2019.
- TM on decommissioning of NORM facilities 25-29 Nov 2019.

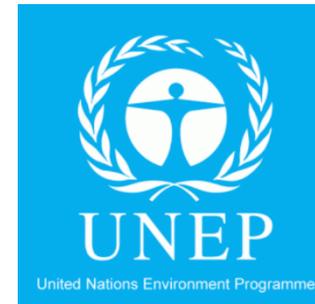
Coordination Group for Uranium Legacy Sites (CGULS)



Aim - Promote co-operation amongst Central Asia Member States with uranium legacy sites and national / international organizations involved in the management, remediation or regulatory oversight of these sites

Objective - Assist Central Asia Member States in developing national regulatory infrastructure and operational capacity for efficient preparedness and implementation of the remediation programs and long-term sustainable and safe management of the legacy sites

Coordination of many interested parties



European Bank
for Reconstruction and Development





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English and Russian
language version of SMP
is online!

<https://nucleus.iaea.org/sites/connect/CGULSpublic/Pages/default.aspx>

The cover of the 'Strategic Master Plan' report. It features a light blue background with a grid of six panels. The top row has three empty panels. The middle row has a large panel on the right containing the title 'Strategic Master Plan' in bold green text, followed by the subtitle 'Environmental Remediation of Uranium Legacy Sites in Central Asia' in smaller black text. Below the title are three smaller images: a mountain valley, a person in protective gear using a detector, and a herd of cattle on a hillside. The bottom row is a wide, horizontal image of a golden field. At the bottom left is the IAEA logo and name, and at the bottom right is the European Union flag. Text at the bottom right of the cover reads: 'Presented at a Side Event of the 61st IAEA General Conference Vienna, Austria, 18 September 2017'.

Strategic Master Plan
Environmental Remediation of Uranium
Legacy Sites in Central Asia

Presented at a Side Event of the 61st IAEA General Conference
Vienna, Austria, 18 September 2017

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International Working Forum for Regulatory Supervision of Legacy Sites (RSLs)



RSLs Established in 2010: promotes efficient management and effective regulatory supervision of legacy sites, consistent with the IAEA Safety Standards and good international practices

Events:

- Technical meetings – November 2016 and November 2018, Vienna,
- Workshops – September 2015 (Romania), October 2017 (France),
- Next mtg Q3/2019 – Portugal (Porto).



MODARIA - International Model Validation and Data Compilation Programme:



- The Modelling and Data for Radiological Impact Assessments programme (MODARIA II) builds experience and transfers knowledge in the assessment of radiation doses from radionuclides that are being released to or are already present in the environment.
- Anyone can register to join one or more MODARIA II Working Groups for the programme by following the instructions on the MODARIA II web-site: <https://www-ns.iaea.org/projects/modaria/modaria2.asp?s=8&l=129>
- The third Technical Meeting on MODARIA II was held in October 2018 and was attended by approximately 150 participants from 47 Member States.
- **The fourth (and final) Technical Meeting on MODARIA II will be held from 21-24 October 2019 in Vienna.**
- It is likely that a new programme will be initiated after MODARIA II to continue the programme.



60 Years

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Atoms for Peace and Development



Headquarters of the IAEA Secretariat in Vienna from 1958 to 1979.
The building on Kärntner Ring today is the Grand Hotel.
(Photo: IAEA)

Thank you