

Fostering Global Networks within our Mandate

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**IUR International Workshop on Worldwide Harmonization of
Radioecology Networks**

Aix en Provence, France, 19-20 June 2014



IAEA

International Atomic Energy Agency

Who are we?

Some details about the IAEA



Key Activities

✓ *COORDINATION.*

of the IAEA

✓ *INFORMATION EXCHANGE.*

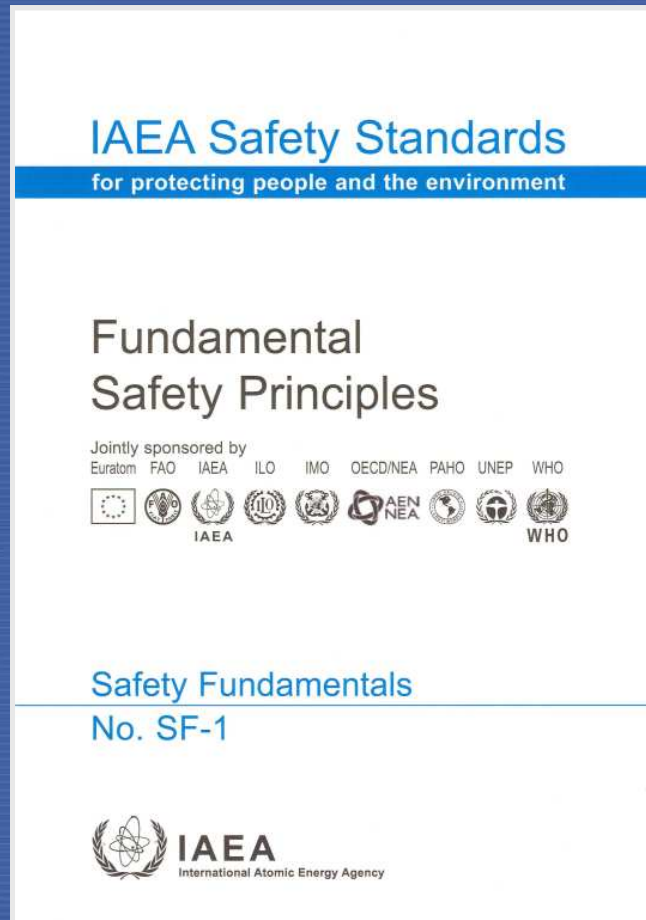
include:

✓ *AGENCY'S SAFETY STANDARDS.*



*..... Consensus,
Harmonization*

The Basis – the Safety Fundamentals



“The fundamental safety objective is to protect people and the environment from harmful effects of ionizing radiation.”

Therefore, A Key Objective Is:



Harmonized
protection of both
humans and the
environment.

Whereby:

- Human activities involving the use of radiation and radioactive substances can cause radiation exposure to the public and the environment.
- This exposure should be regulated and monitored in accordance with international safety standards and national legislation.



System of Radiation Protection:

Demonstration of Protection



- ***Three Exposed Groups:***

- Workers
- Patients
- General public

- ***Three Exposure Situations:***

- Planned exposures
- Emergency
- Existing exposures

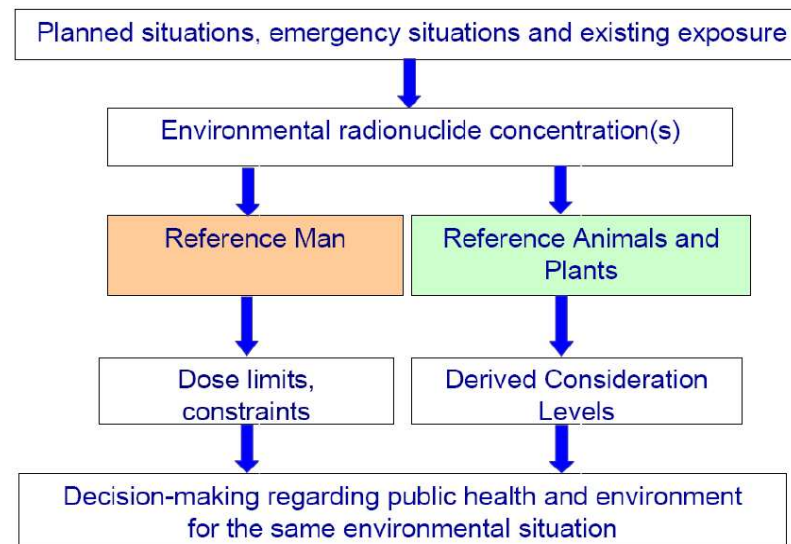
- ***Three Radiation Protection Principles:***

- Justification
- Limitation
- Optimization

To demonstrate protection, we need to first determine where to start.



Common approach for protection of human and biota



And this can be accomplished in the context of frameworks that provide a working structure and context within which decisions can be made.

Some Scientific Questions over Recent Years



- ✓ **Level of Protection:** What do we protect? Protection of the Individual vs. the Population (and higher ??). Which species?
- ✓ **Demonstration of Protection:** What do we measure? [mutation, mortality, morbidity, reproduction, biodiversity, adaptation(?)]
- ✓ **Setting the Standard:** Concept of Reference Organism vs. Reference Animals and Plants (equivalent to 'Reference Man').
- ✓ **Harmonization with 'Man' (coming 'full-circle'):** Can a system be developed that will ensure the protection of both humans and the environment?
- ✓ **Harmonization in Nature:** How can this be done in the context of multiple contaminants and multiple stressors?

Some Possible Objectives

- A Rough Breakdown -

Tool Development



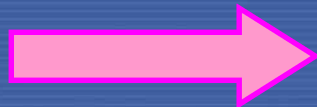
How to?

Tool Testing



How good?

Compilation, Evaluation &
Harmonization (?)



Where can this fit?

Compatibility, Consensus
& Guidance



Where do we go from here?

Key Steps in Harmonized Protection

Tool Development



e.g., CROM (SRS-19), RESRAD codes, ERICA, PC-CREAM, **CROMERICA** (& others)

Tool Testing



MODARIA, EMRAS-II, EMRAS (& predecessors – VAMP, BIOMASS, etc.)

Compilation, Evaluation & Harmonization



e.g., IAEA guidance on Radiological Environmental Impact Analysis, Revision of Safety Review Series (SRS)-19, etc.

Compatibility, Consensus & Guidance



IAEA, ICRP, UNSCEAR, IUR, BIOPROTA, etc.
etc.



International **COORDINATION**

- ✓ The **objective** is to establish a 'coordinating mechanism' to facilitate the coordination of work amongst international and regional organizations by reviewing their ongoing work on topics related to radiation protection.
- ✓ This involves coordination amongst international and regional organizations (e.g. UNSCEAR, ICRP, IUR, OECD/NEA, EC and national institutions for coordination).

Objectives of IAEA Model Validation Programmes

To improve capabilities in the field of environmental dose assessment by means of acquisition of improved data for:

- Model testing
- Model testing and comparison
- Reaching consensus on modeling philosophies
- Approaches and parameter values
- Development of improved methods
- Information exchange



Key Steps in Harmonized Protection

Tool Development



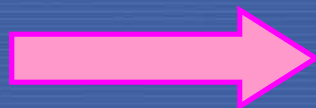
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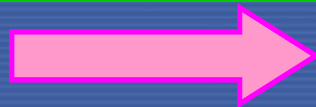
Key Steps in Harmonized Protection

Tool Development



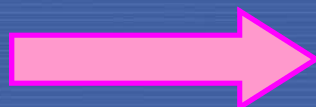
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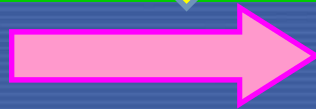
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International **COORDINATION** *through Model Validation Programmes*

- BIOMOVs (BIOspheric Model Validation Study) and BIOMOVs II (initiated by the Swedish Regulatory Authority in 1985)
- VAMP (*VALidation of Model Predictions*, 1988–1996)
- BIOMASS (*BIOsphere Modelling and ASSessment*, 1996–2001)
- EMRAS (*Environmental Modelling for Radiation Safety*, 2003-2007)
- EMRAS-II (2009-2011)
- **MODARIA** (**MOdelling and DAta for Radiological Impact Assessments**, 2012-2015)



Information **EXCHANGE**

- ✓ *Fostering information exchange on nuclear safety to facilitate early identification of issues by regulators, by national bodies of research and expertise, and by other key stakeholders.*





Information **EXCHANGE**

- Conferences, workshops, meetings, dialogue
- Integration of information into documentation
- Presentations, internet, email, phone calls

Are there ways we can work together in a mutually beneficial way?



Development of **IAEA SAFETY STANDARDS**

- ✓ **SUPPORT** to Member States through understanding, experience and practical implementation of the framework.
- ✓ **REVIEW** of existing IAEA Safety Standards and the implications of including radiation protection in these standards.
- ✓ **DEVELOP** safety requirements for radiation protection of the environment and related safety guides (as appropriate).
- ✓ **DEVISE** a technical framework and methodology for drafting procedures that may be used to demonstrate compliance with the objectives of radiation protection of the environment.
- ✓ **PROVIDE** for the application of Safety Standards through assisting in the development of national capabilities.

Key Steps in Harmonized Protection

Tool Development



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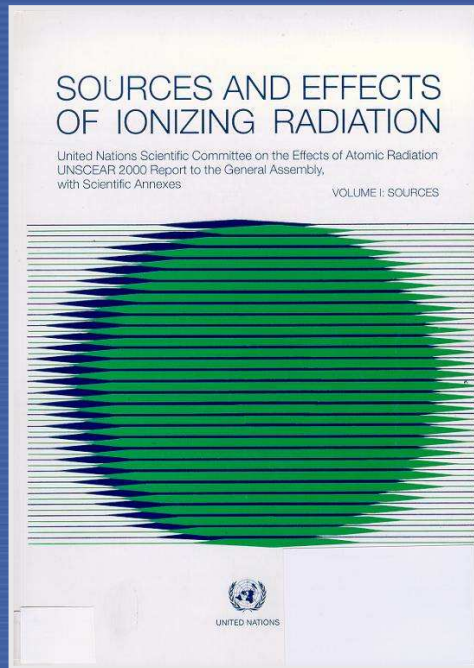
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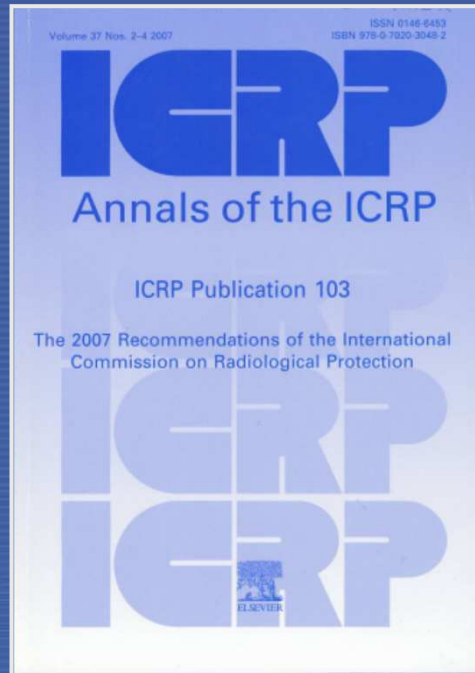
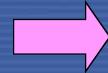
IAEA, ICRP, UNSCEAR, IUR, BIOPROTA, etc.
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Standards Development Process



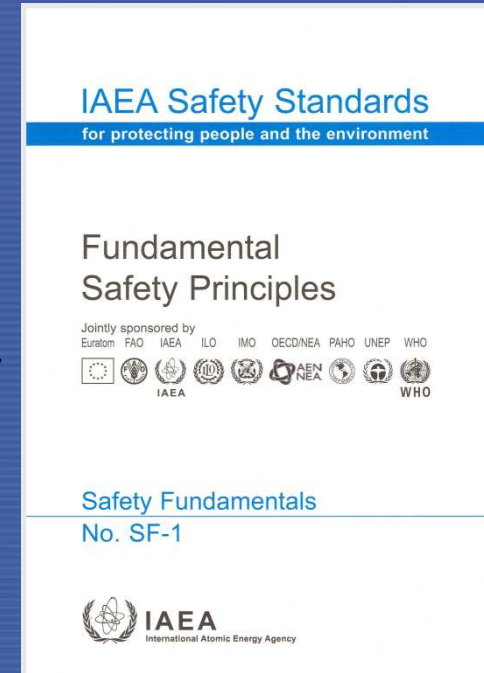
UNSCEAR

- Scientific reports
- Data on sources and effects of radiation



ICRP

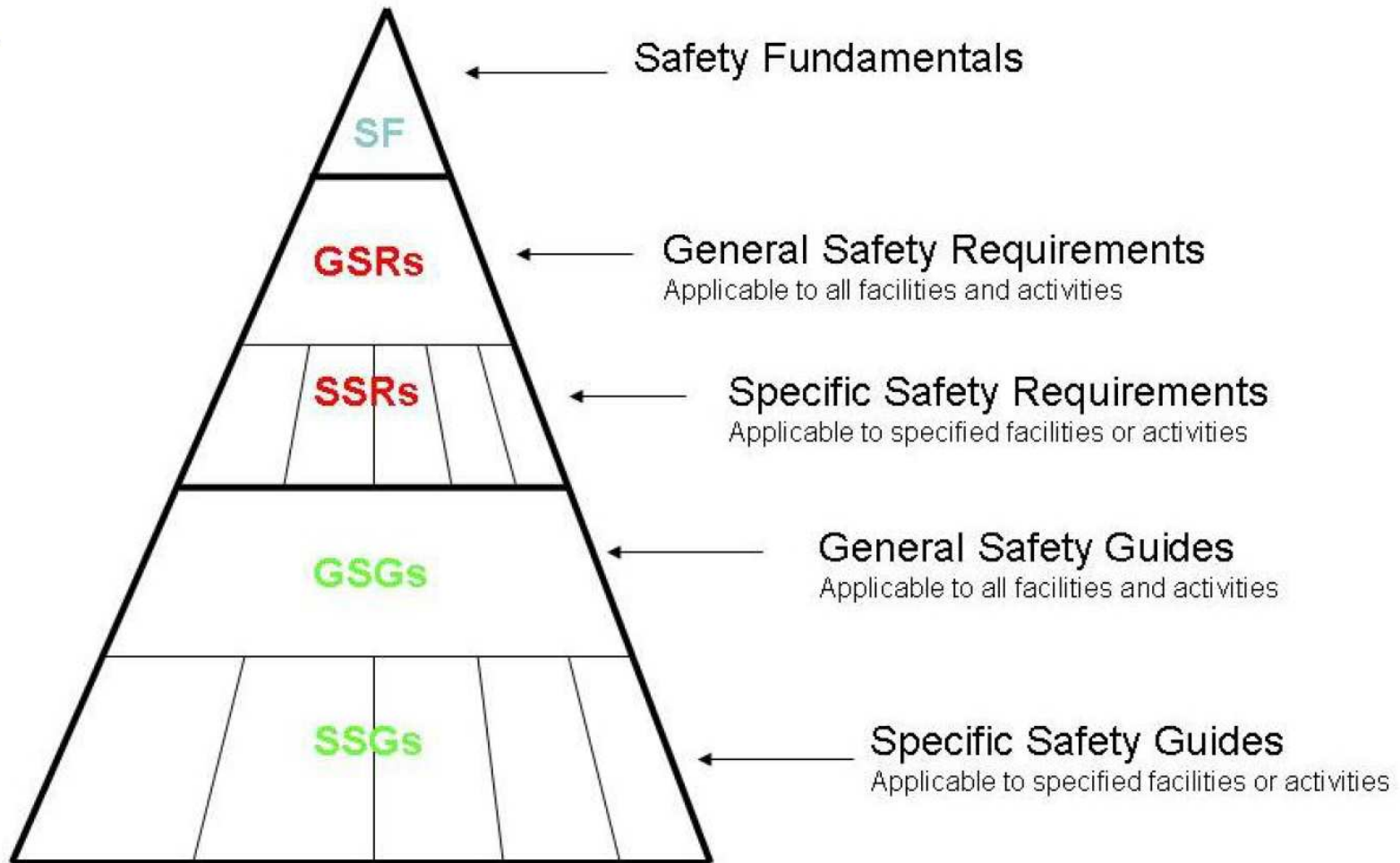
Recommendations
for protection



IAEA

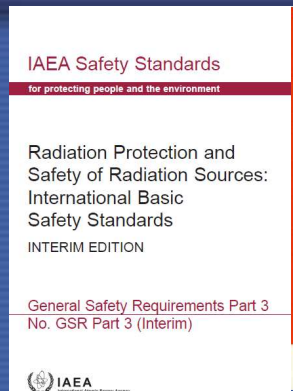
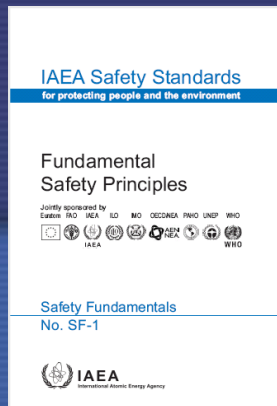
Regulatory style
standards

Hierarchy of IAEA Safety Standards:

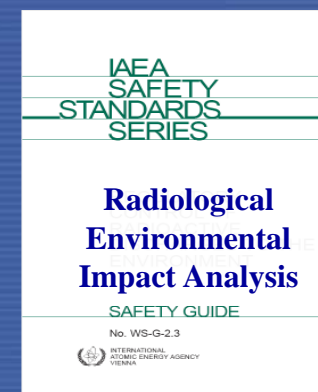
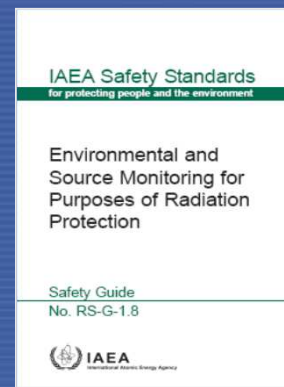
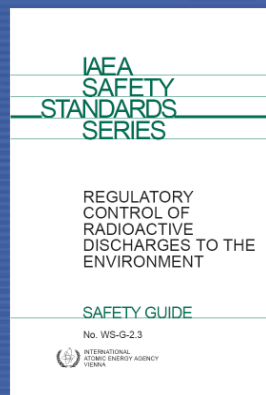


IAEA Document STRUCTURE

*Safety Fundamentals
(high-level objectives,
concepts & principles)*



*Safety Standards
(‘shall’ requirements)*



*Safety Guides
(‘should’ recommended actions, conditions
or procedures to meet safety requirements)*

Potential Area of Mutual Interest:

*Technical Report Series & Technical Documents
(technical basis)*

Key Steps in Harmonized Protection

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Tool Testing



MODARIA, EMRAS-II, EMRAS
(& predecessors)

**Compilation, Evaluation &
Harmonization**



IAEA GUIDANCE ON REMEDIATION
OF AFFECTED AREAS; RSLs
(REGULATORY SUPERVISION OF
LEGACY SITES; ETC.

**Compatibility, Consensus
& Guidance**



IAEA, ICRP, UNSCEAR, IUR,
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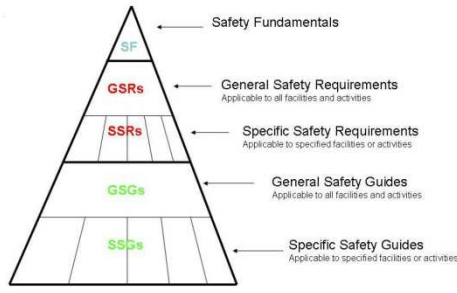
International Relevance

Expertise, Innovation, Leadership, R&D



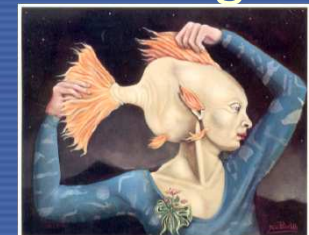
IAEA

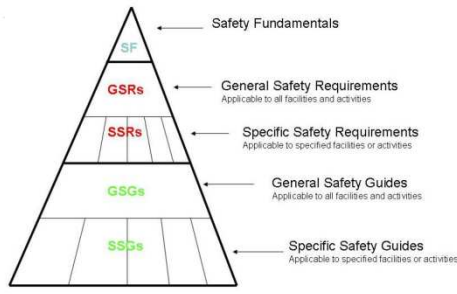
- *Application, Tools, Credibility, Consensus* -



Summary:

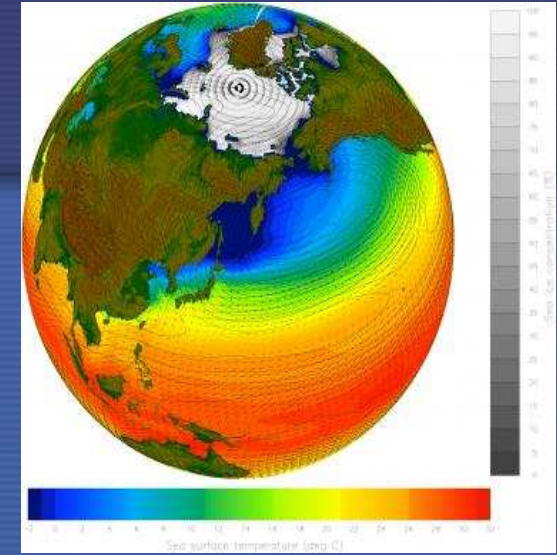
- The IAEA is responsible for activities of coordination, information sharing and development of safety standards.
- Activities are carried out in a harmonized manner, with consideration of those undertaken by other organizations.
- For example, international model validation programmes provide a forum for evaluation of tools and standardization of approaches to assess potential risk. Findings from such studies can then be considered in IAEA safety standards (e.g., updated SRS 19).
- In addition, through such programmes, international data are compiled to gain understanding of natural processes for a range of situations.





Summary:

- The outputs of activities, such as MODARIA, form the technical basis that informs higher-level IAEA guidance documents.
- One example is IAEA SRS-19, which provides guidance on predicting radionuclide transport in the environment and corresponding doses .
- **Through such activities and programmes, it would be useful to identify mechanisms to leverage such efforts and strengthen international networking.**
- **In this way, self-perpetuating positive feedback loops can be created to the benefit of the international community.**



Thank YOU!!

