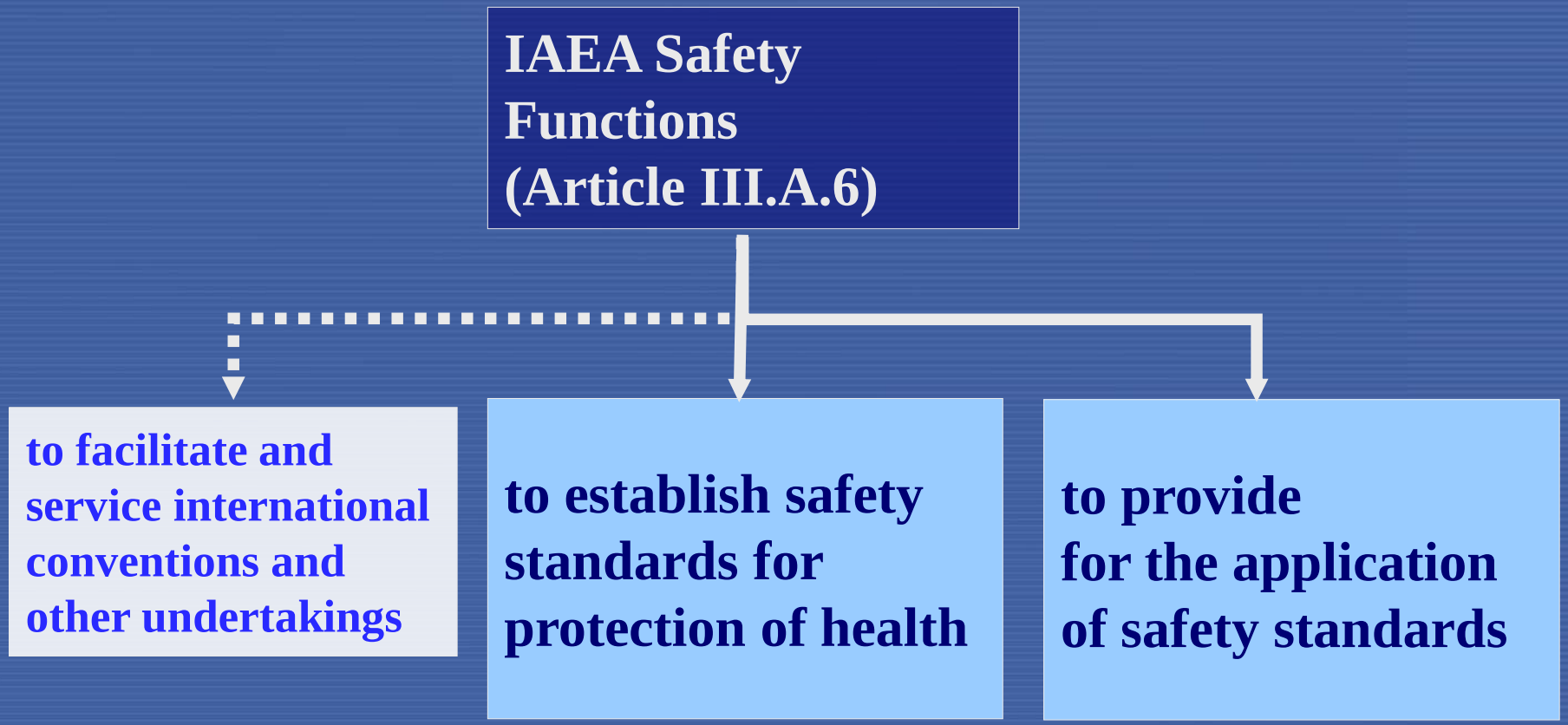
IRPA13 Congress
Glasgow/Scotland
14th to 18th May 2012

Plenary Session 3
"The System of Protection: Current and Future Developments"
IAEA perspective

Pil-Soo HAHN
Director,
Division of Radiation, Transport and Waste Safety

IAEA
International Atomic Energy Agency

IAEA Safety Functions



IAEA

Global Safety Regime

- **Protection against ionizing radiation** and **safety and security of radiation sources** is an international concern
- Many actors are involved
- The international community **has been developing a sophisticated system** to ensure safety, based on sound scientific evidence, best practices and lessons learned from incidents
- Countries are **advised to follow the international safety standards**

IAEA

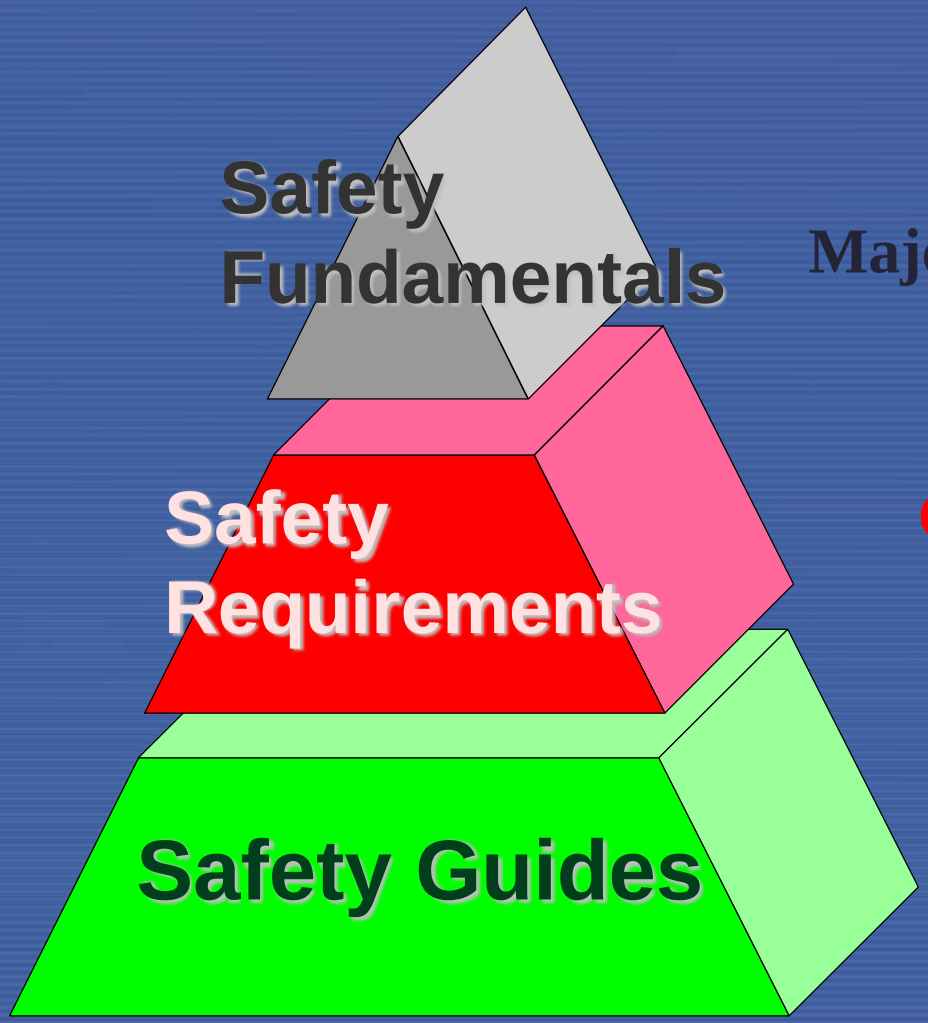
Global Safety Regime

- Shares common goals of **preventing serious incidents** and continuously **improving the global levels of safety** to protect people, society and environment and facilitate the use of nuclear technology

- Achieves goals **by promoting compliance with the Conventions, Codes and Safety Standards**

IAEA

Hierarchy of IAEA Safety Standards



Major principles

Obligations & responsibilities

Recommendations to support requirements

IAEA

Safety Standards
(Structure of the Safety Requirements)

General Safety Requirements

Part 1 Governmental, Legal and Regulatory Framework

Part 2 Leadership and Management for Safety

Part 3 **Radiation Protection and Safety of Radiation Sources**

Part 4 Safety Assessment for Facilities and Activities

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

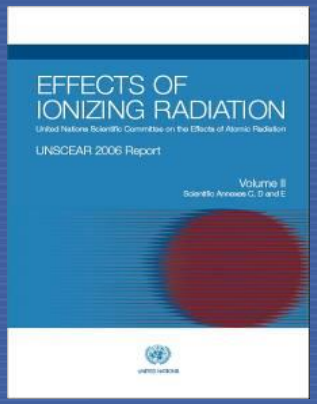
3. Safety of Research Reactors

4. Safety of Nuclear Fuel Cycle Facilities

5. Safety of Radioactive Waste Disposal Facilities

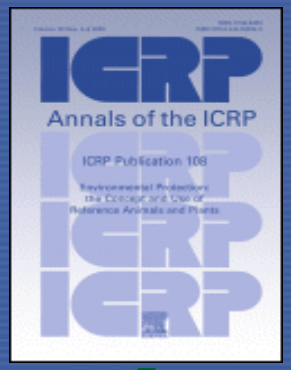
6. Safe Transport of Radioactive Material

IAEA Safety Standards
(Radiation Safety Framework)



UNSCEAR
- Scientific basis

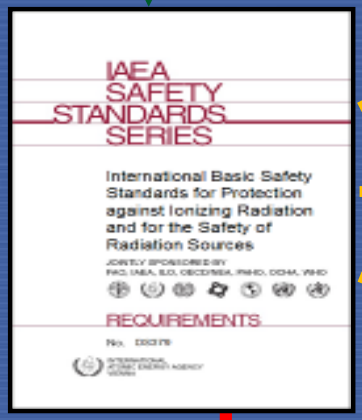
Effects
Risks



ICRP
- Protection philosophy
- Principles and units

Recommendations

D/base
- levels
- trends



IAEA
-Safety standards
-Protection programmes

Implemented by Member States

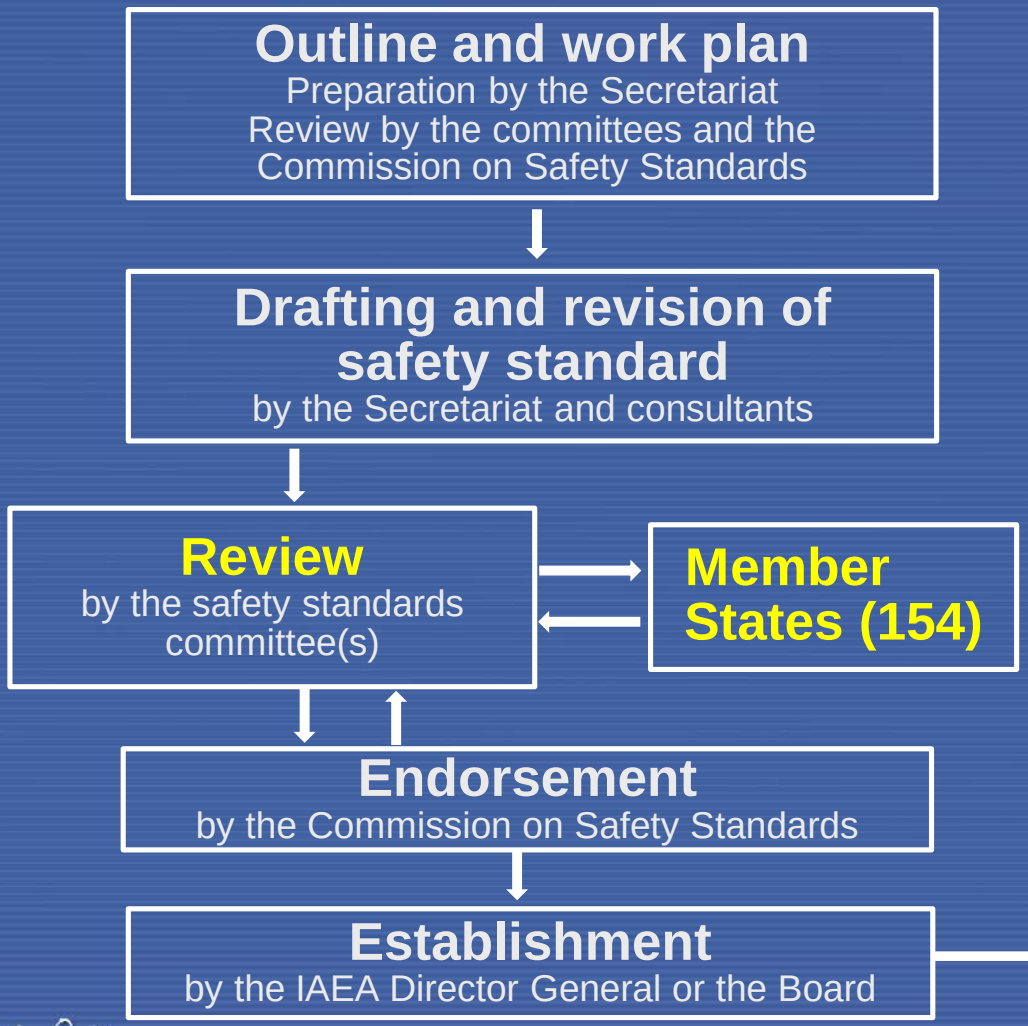
ILO convention 115: occupational radiation protection

FAO/WHO
Codex Alimentarius Commission. (food contamination guides)

UN transport regulations for radioactive material

IAEA

Development Procedure of Safety Standards



- **SF and SRs:** approval by Board
- **SGs:** approval by DG

IAEA

Status of the IAEA Safety Standards

- **Safety Standards are not legally binding** on Member States, but may be adopted by them.

However…

- **They are legally binding under certain situations**
  - IAEA's own activities.
  - States in relations to operations assisted by the IAEA.
  - States wishing to enter into project agreements with IAEA.

IAEA

System of Protection and Safety

- *(IAEA GSR Part 3 (Interim):BSS)* **The system of protection and safety** aims to **assess, manage and control exposure to radiation** so that **radiation risks**, including risks of health effects and risks to the environment, **are reduced to the extent reasonably achievable.**

IAEA

Radiation Safety Clearance

- **Radiation Safety Clearance** is applied when the Agency is procuring radioactive sources for MS
- "**Milestones**" approach was adopted for **MSs in early phases of building their radiation safety infrastructure**
- The "Milestones" have become incorporated as elements of more detailed **Thematic Safety Areas**

IAEA

Thematic Safety Areas

- **TSA 1 :** Regulatory Framework
- **TSA 2 :** Occupational Radiation Protection
- **TSA 3 :** Radiation Protection in Medical Exposure
- **TSA 4 :** Public Radiation Protection
- **TSA 5 :** Emergency Preparedness and Response
- **TSA 6 :** Education and Training

IAEA

Radiation Protection of Workers

- **Specialized maintenance activities are likely to become a competitive and global business!**
  - highly skilled workforce will become increasingly mobile
  - less trained and qualified workers are employed

Control will be more and more diverse and complex

Optimization has become an increasing importance

Increasing needs of ensuring RP-culture
(transferable language, consistent regulations,….)

IAEA

Radiation Protection in Medicine

Fundamental issues from current practices

- Medical use of ionizing radiation is a **massive global activity** (>10M exposures per day)
- **Underlying reasons** for medical RP-issues
  - **Human errors**
  - **Lack of knowledge or experience**
  - **Lack of resources, support or safety culture**
  - **Self-motivated economical interest or defence against litigation**
  - **Pressure and expectations from patients**
- **Dose limits normally don't apply** to medical exposures

IAEA

Radiation Protection in Medicine

International campaign AAA

From international workshop(2009) to **improve the implementation of justification**

- **Awareness, Appropriateness and Audit**
  - Effective communication about risk
  - Up-to-date referral guidelines
  - Clinical audit of justification

IAEA

Radiation Protection in Medicine

- **Web based interaction with a large community has been effective:**
  - *Continuous updating of the **IAEA rpop web site** (www.rpop.iaea.org)*
  - *Safety in Radiation Oncology (**SAFRON**) pilot has started. The system expected to open for general use later in 2012*

IAEA

Radiation Protection in Medicine

International Conference on Radiation Protection in Medicine,

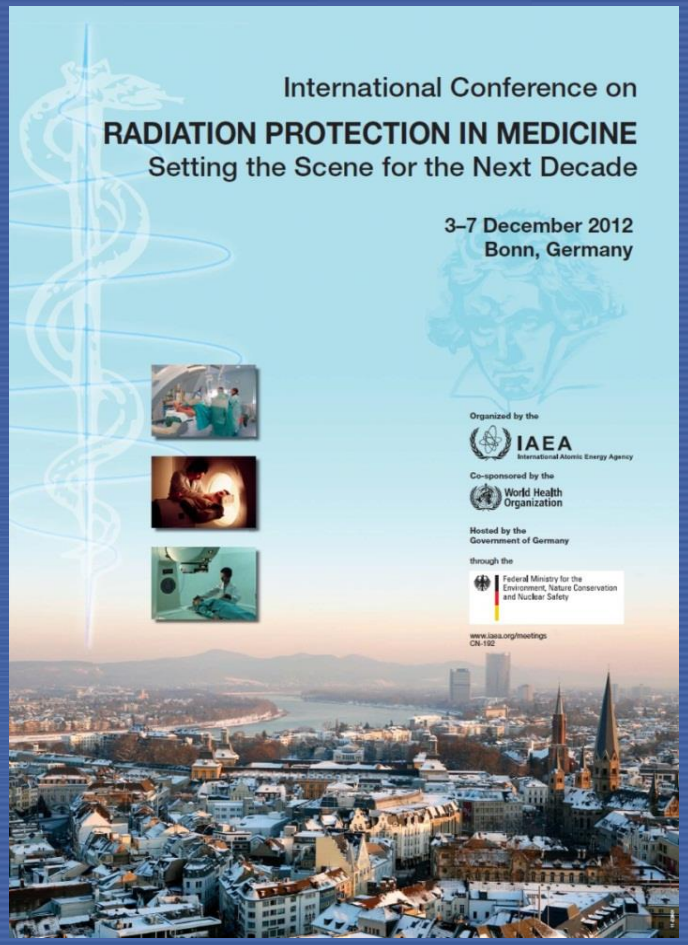
Setting the scene for the next decade

Bonn/Germany,

3 – 7 December 2012

Identify gaps

Identify ways



IAEA

Control of Radiation Sources

- **There have been a** *very good progress in many countries*
- However, the issue is still an **ongoing challenge (!)**

International Conference on the Safety and Security of Radioactive Sources:

- Maintaining the Continuous Global Control of Sources throughout their Life Cycle

Abu Dhabi, UAE

October 27-31, 2013.

IAEA

Protection of Environment

Integrated approach for the protection of environment with objectives of :

- **Prevention of radiological effects on flora and fauna**
- **Man is an integral part of the environment**
- **Ensure the sustainable use of natural resources – now and in the future : Agriculture /Forestry/Fisheries**

➡ ***Develop simple tools to demonstrate compliance with these objectives***

IAEA

The MODARIA Programme

Modelling and Data for Radiological Impact Assessment

First Technical Meeting:

Vienna, 19-22 November 2012

MODARIA is the follow-up of EMRAS II: Environmental Modelling for Radiation Safety (2009-2011)

IAEA

Proposed topics in MODARIA

- Decision making in **remediation processes**
- Exposures to the public at **NORM and legacy sites**

- Exposures in cities **after nuclear accidents / malevolent acts**
- Radiological impacts to **flora and fauna**
- Modelling radionuclides in **marine systems**
- Exposure models for safety assessments of **waste disposals**

- **Data sets** to estimate exposures in different ecosystems
- **Uncertainty and variability** in exposure modelling

IAEA

Implementation of the IAEA Safety Standards

- **The IAEA safety standards seen as the global reference** for nuclear, radiation protection, radioactive waste and transport safety
- Used by Member States **to deliver consistent levels of safety** for the protection of people, the society and the environment

IAEA

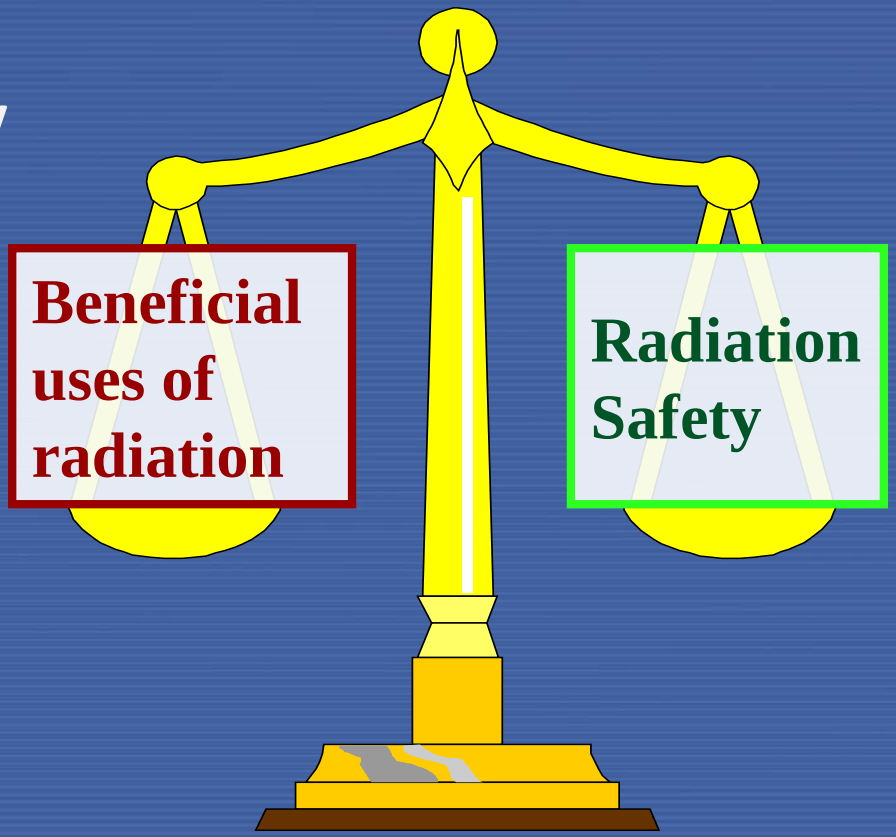
Building on Existing Tools

- Increased **international collaboration** in developing guidance in radiation protection
- Targeted efforts in **education and training**
- **Effective communication** on radiation protection and risks **with the public**
- **Feedback mechanisms** with relevant organizations and other interested parties/users
- Strengthen **appropriate review mechanisms** for the implementation of standards
- **Strengthen the cooperation** in the Inter-agency Committee on Radiation Safety (IACRS, 1990 ~)

IAEA

Summary

The use of radiation **provides many benefits to society,** however…



The continued use of radiation **requires efforts to provide confidence** that **it can be used safely.**

IAEA

Thank You for your attention

IAEA

Conventions and Codes of Conduct

- **Joint Convention** on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- **Code of Conduct** on the Safety and Security of Radioactive Sources
- ***Proposed* Code of Conduct** on the Transboundary Movement of Radioactive Material Inadvertently Incorporated into Scrap Metal and Semi-Finished Products of the Metal Recycling Industries

IAEA