IAEA
International Atomic Energy Agency

International
Labour
Organization

Occupational
Radiation
Protection

# Occupational Radiation Protection

## Introduction and Framework for ORP

## GSG7: Sections 1 and 2

# Presentation contents

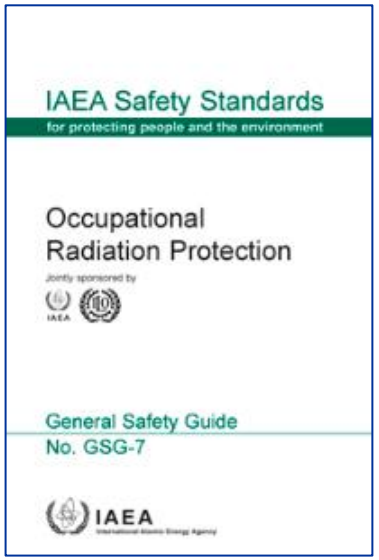
- IAEA Safety Standards
- Background to GSG7
- GSG7 Structure and Course Programme
- Framework for ORP
  - Exposure situations and RP Principles
  - Responsibilities
  - Graded approach

# Expected outcomes

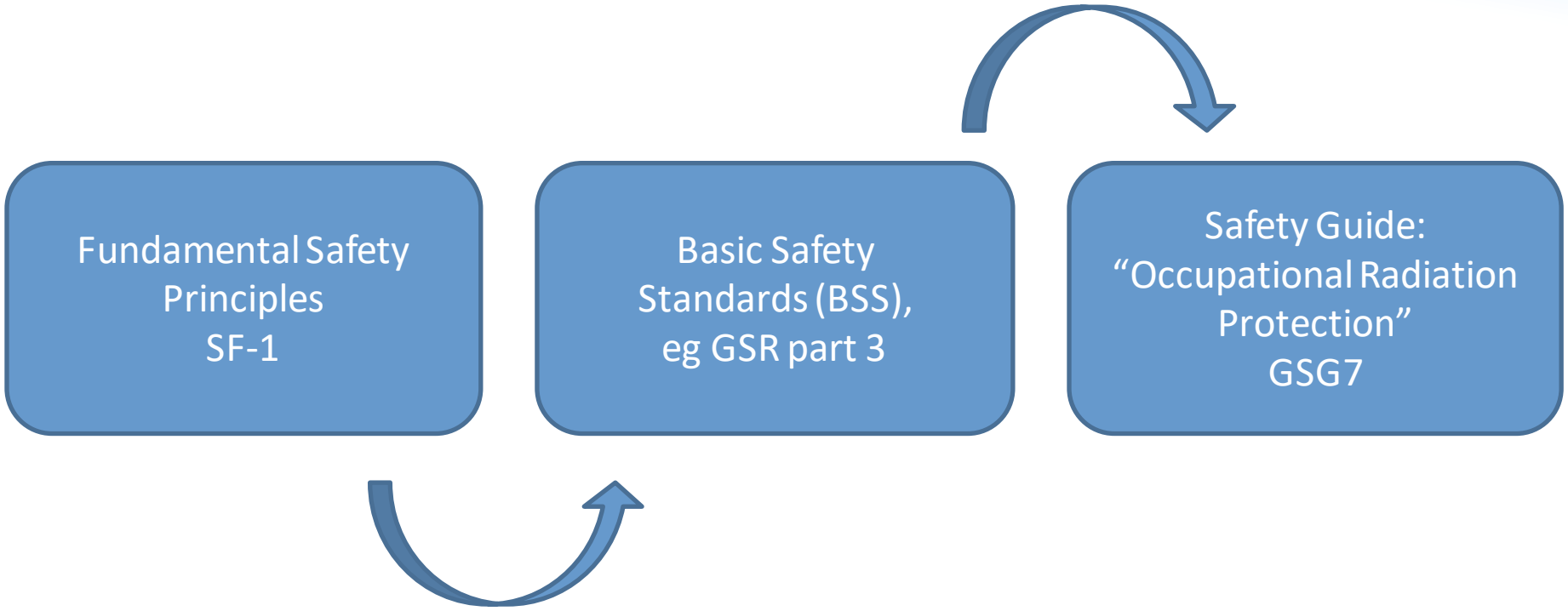
Understand the structure and contents of GSG7, and how this safety Report fits within the IAEA Safety Standards hierarchy.

Understand the specific requirements of GSG7 relating to planned, existing and emergency exposure situations, and the protection of workers in special cases (GSG7 sections 1 to 6).

Be aware of the GSG7 requirements relating to assessment of occupational exposures, technical service providers, workplace controls and PPE, and workers health surveillance (GSG7 sections 7 to 10, Appendices and Annex).



# IAEA Safety Standards



# IAEA GSG7: Background

1

Joint
IAEA and ILO
Safety Guide

2

Takes account of ICRP Publication 103

- New system based on “exposure situations”

3

Updates and replaces:

- Occupational RP: RS-G-1.1
- Assessment of exposures from intakes: RS-G-1.2
- Assessment of external exposures: RS-G-1.3
- ORP in mining and milling: RS-G-1.6
- Management of technical services: GS-G-3.2

# GSG7: Structure and Course Programme

- Framework for ORP (GSG 7 chapter 2)
- Planned Exposure Situations (3)
- Emergency Exposure Situations (4)
- Existing Exposure Situations (5)
- Protection of workers in special cases (6)
- Assessment of occupational exposure (7)
- Management of technical service providers (8)
- Engineered, administrative controls and PPE (9)
- Workers' health surveillance (10)

Appendices I to V, and Annex not specifically covered.

# Framework for ORP: Exposure Situations

| Planned Exposure Situations | Emergency Exposure Situations | Existing Exposure Situations |
|---|---|---|
| • Planned operations and activities<br>• Provisions for safety can be made in advance<br>• Exposures can be restricted from the start<br>• Essentially the same as "practices" | • From accidents, malicious acts or other unexpected event<br>• Requires prompt action<br>• Prevention and mitigation actions can be taken before<br>• Actions to restrict exposures taken after the accident occurs | • Already present when decisions on the need for control are required<br>• Exposure to natural background radiation<br>• Residual radioactivity from uncontrolled past practices, or following an emergency exposure situation. |

**Occupational exposures can occur in any exposure situation**

# Exposure Situations

**Not always obvious which type of exposure situation applies**

- Transition from emergencies
- Some exposures to natural sources
- "potential exposures" (planned or emergency)

**Exposures not amenable to control are excluded**

- E.g. K-40 in the body, cosmic rays at ground level

# Framework for ORP: Exposure Situations

| Planned exposure situations | Emergency Exposure Situations | Existing Exposure Situations |
|---|---|---|
| **JUSTIFICATION**<br>• Practices (sources) must be justified. | • Protective actions to be justified | • Protective actions to be justified |
| **OPTMIZATION**<br>• Individual and collective doses, and likelihood of potential exposures to be ALARA.<br>• Use of dose constraints | • Protection measures to be optimized<br>• Use of dose reference levels | • Protection measures to be optimized<br>• Use of dose reference levels |
| **DOSE LIMITATION**<br>• Workers doses subject to individual dose limits | • Dose guidance values for restricting exposure of emergency workers | • No dose limits |

# GSG7: Framework-Responsibilities

| | |
|---|---|
| **Government** | • Regulatory and legal framework<br>• Legislation and regulatory body<br>  • *Independence and authority*<br>  • *Competence and resources*<br>• Requirements for education and training<br>• Provision of technical and training services |
| **Regulatory Body** | • Establish RP requirements and regulatory system<br>• Setting acceptance and performance criteria<br>• Dissemination of lessons learned from accidents<br>• Application of education and training requirements<br>• Record-keeping provisions |
| **Employers, registrants and licensees (Management)** | • *"prime responsibility for protection and safety…"*<br>• Optimization of protection and dose limits<br>• Radiation Protection Programmes |
| **Workers** | • Following procedures, use of dosimeters, PPE, etc<br>• Act in a responsible manner |

# Graded approach

BSS: “The application of the requirements for the system of protection and safety shall be commensurate with the radiation risks associated with the exposure situation.”

Government: Overall responsibility
Regulatory Body: incorporate into Regulations
Especially relevant to Planned Exposure Situations, eg exemption and clearance

“The government or the regulatory body shall determine which practices or sources …are to be exempted from …these Standards.
The regulatory body shall approve which sources, including materials and objects …may be cleared from regulatory control.”

# …. and also …

## MANAGEMENT SYSTEM

- GS-R-3. The Management System for Facilities and Activities, IAEA (2006).
- GS-G-3.1. Application of the Management System for Facilities and Activities, IAEA (2006).
- ILO-OSH Guidelines on Occupational Safety and Health Management Systems, ILO (2001).

## DOSIMETRIC QUANTITIES

- Radiation protection quantities (effective dose and equivalent dose)
- Operational quantities for workplace and individual monitoring
- Quantities for monitoring of radon

# Questions and Discussion

# Exercise-exposure situations

Create 3 lists giving examples of different exposure situations:

1. Planned
2. Emergency
3. Existing

QUESTIONS
AND
DISCUSSION