



**IAEA**

International Atomic Energy Agency  
*Atoms for Peace and Development*

# Occupational Radiation Protection during High Exposure Operations

IAEA Documents on  
Occupational Radiation Protection with High Exposure

# Contents

- Background
- Safety Standards
  - Safety Fundamentals, Safety Requirements, Safety Guides, Safety Reports - IAEA TECDOC
- Practical Radiation Technical Manuals
- EPR related publications

# Hierarchy of the Safety Standards



# Safety Fundamentals

As the primary publication in the Safety Standards Series, the IAEA publication SF-1; Fundamental Safety Principles establishes the fundamental safety objective and principle.

## IAEA Safety Standards

for protecting people and the environment

### Fundamental Safety Principles

Jointly sponsored by

Euratom FAO IAEA ILO IMO OECD/NEA PAHO UNEP WHO



Safety Fundamentals

No. SF-1



## Ten principles

1. Responsibility for safety
2. Role of government
3. Leadership and management for safety
4. Justification of facilities and activities
5. Optimization of protection
6. Limitation of risks to individuals
7. Protection of present and future generations
8. Prevention of accidents
9. Emergency preparedness and response
10. Protective actions to reduce existing or unregulated radiation risks

# Safety Requirements

An integrated and consistent set of Safety Requirements that establishes the requirements that must be met to ensure the protection of people and the environment, both now and in the future.





Among documents includes in the Safety Requirements, occupational radiation protection and emergency preparedness and response are contained in:

## GSR Part 3;

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

## GSR Part 7;

***Preparedness and Response for a Nuclear or Radiological Emergency***

IAEA Safety Standards for protecting people and the environment	IAEA Safety Standards for protecting people and the environment
<p>Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards</p> <p>Jointly sponsored by EC, FAO, IAEA, ILO, OECD/NEA, PAHO, UNEP, WHO</p>  <p>General Safety Requirements Part 3 No. GSR Part 3</p>	<p>Preparedness and Response for a Nuclear or Radiological Emergency</p> <p>Jointly sponsored by the FAO, IAEA, ICAO, ILO, IMO, INTERPOL, OECD/NEA, PAHO, CTBTO, UNEP, OCHA, WHO, WMO</p>  <p>General Safety Requirements No. GSR Part 7</p>
 <b>IAEA</b> International Atomic Energy Agency	 <b>IAEA</b> International Atomic Energy Agency

# Safety Requirements

## Structure of Safety Standards



# Safety Guides

Safety Guides (such as GS-G-2.1 hereunder) provide recommendations and guidance on how to comply with the Safety Requirements. Recommendations in the Safety Guides are expressed as “should” statements.

## IAEA Safety Standards

for protecting people and the environment

Arrangements for  
Preparedness for a  
Nuclear or Radiological  
Emergency



Safety Guide  
No. GS-G-2.1



A new Safety Guide (**DS 453**) “Occupational Radiation Protection” will be published as a combination of 5 existing Safety Guides

- ✓RS-G-1.1: *Occupational Radiation Protection*
- ✓RS-G-1.2: *Assessment of Occupational Exposure Due to Intakes of Radionuclides*
- ✓RS-G-1.3: *Assessment of Occupational Exposure Due to External Sources of Radiation*
- ✓RS-G-1.6: *Occupational Radiation Protection in Mining and Processing of Raw Materials*
- ✓RS-G-3.2: *The Management System for Technical Services in Radiation Safety*

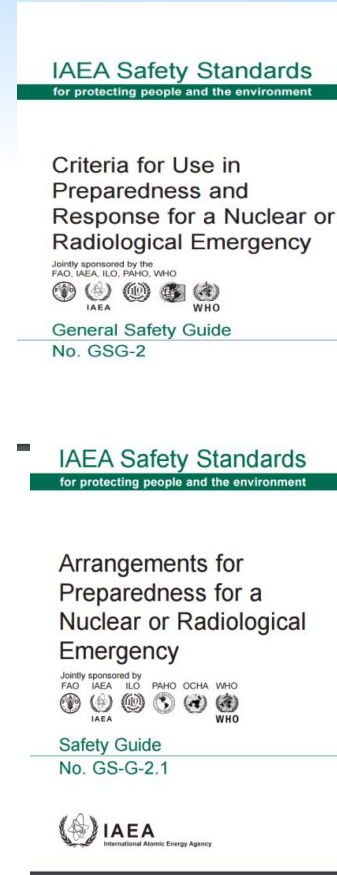
# Safety Guides

For a nuclear or radiological emergency:

✓GSG-2; *Criteria for Use in Preparedness and Response for a Nuclear and Radiological Emergency*

For threat category:

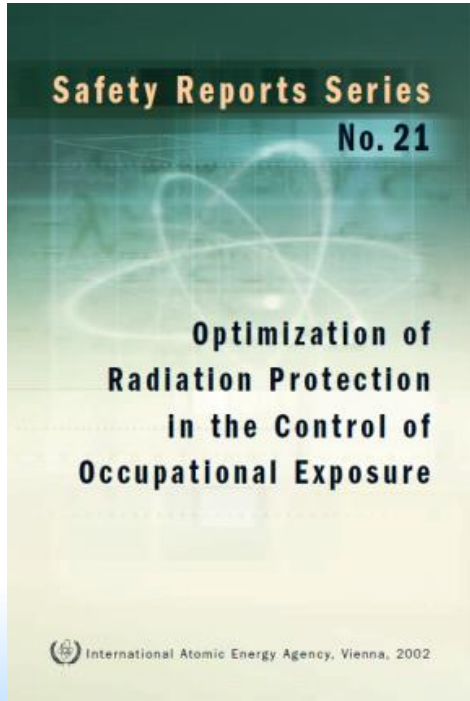
✓GS-G-2.1; *Arrangement for Preparedness for a Nuclear or Radiological Emergency*





# Safety Reports

Safety reports are not part of the Safety Standards, nevertheless the following Safety Reports are useful for occupational radiation protection.

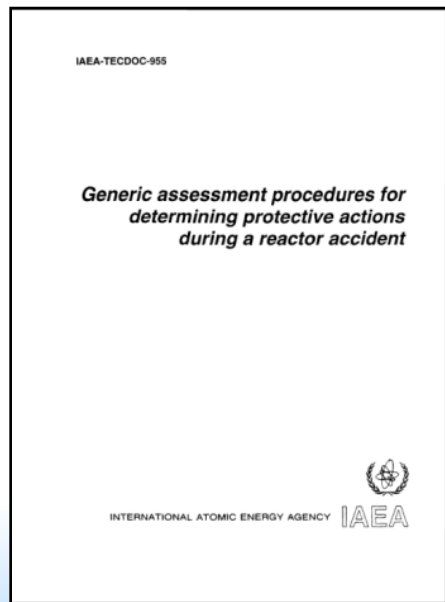


- ✓ No.16: *Calibration of Radiation Protection Monitoring Instruments*
- ✓ No.20: *Training in Radiation Protection and the Safe Use of Radiation Sources*
- ✓ No.21: *Optimization of Radiation Protection in the Control of Occupational Exposure*
- ✓ No.37: *Methods for Assessing Occupational Radiation Doses Due to Intakes of Radionuclides*

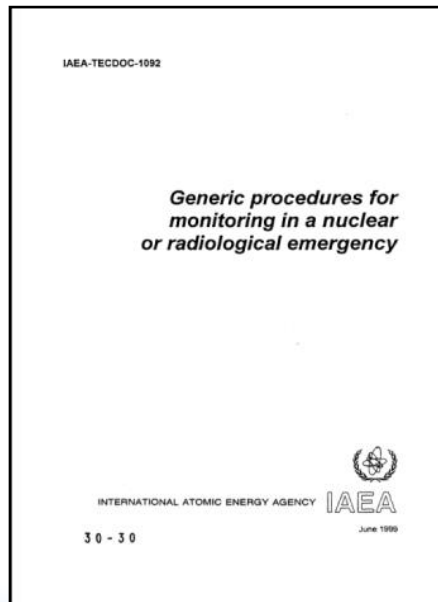
From the view point of accident and emergency the following documents are recommended:

- ✓ IAEA-TECDOC-955; *Generic assessment procedures for determining protective actions during a reactor accident*
- ✓ IAEA-TECDOC-1092; *Generic procedures for monitoring in a nuclear or radiological emergency*
- ✓ IAEA-TECDOC-1162; *Generic procedures for assessment and response during a radiological emergency*
- ✓ IAEA-TECDOC-1300; *Follow-up of delayed health consequences of acute accidental radiation exposure*
- ✓ IAEA-TECDOC-1432; *Development of an extended framework for emergency response criteria*

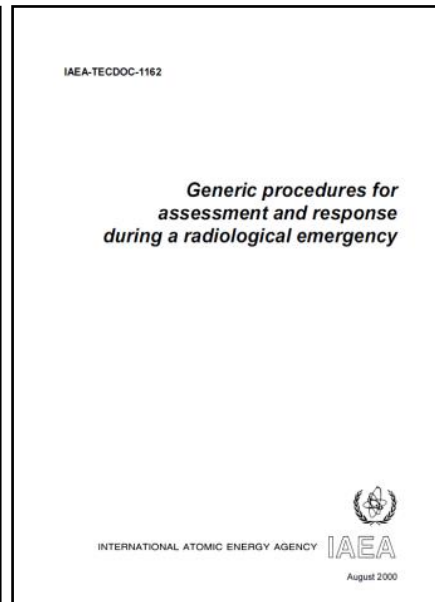
## Protective action



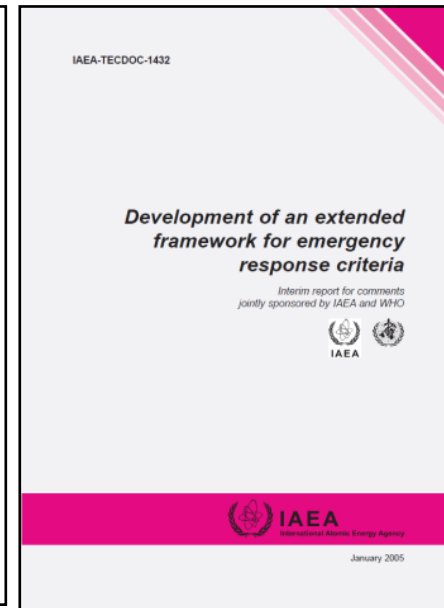
## Monitoring



## Assessment



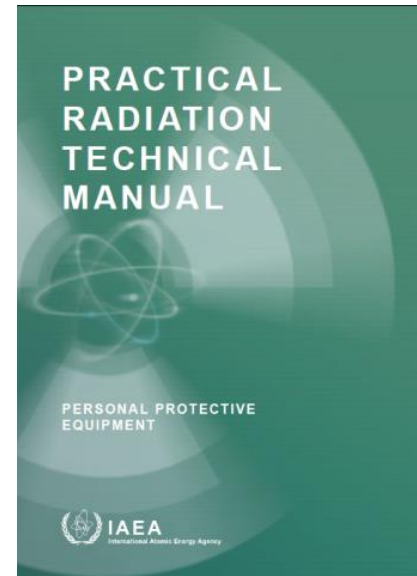
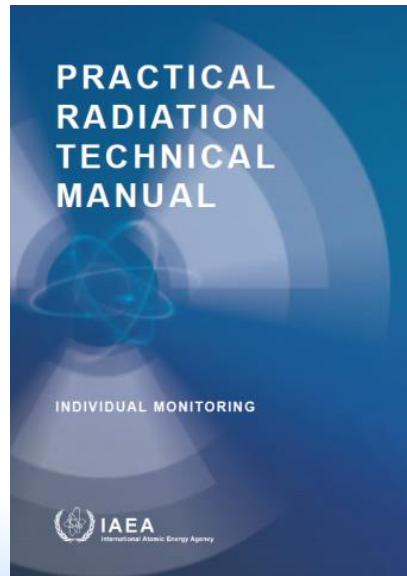
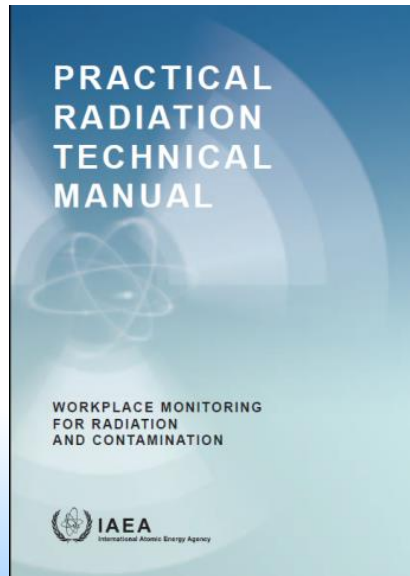
## Extended Framework



# Practical Radiation Technical Manuals

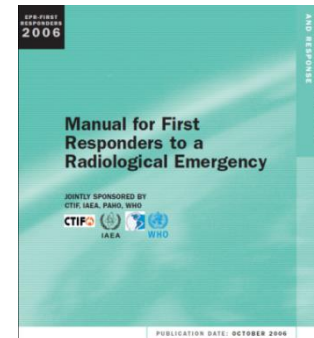
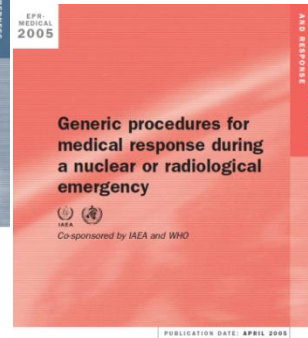
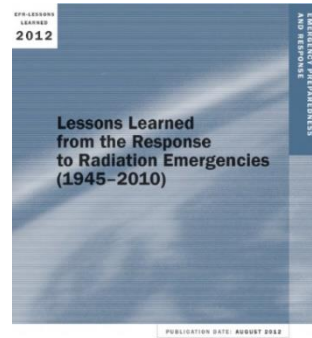
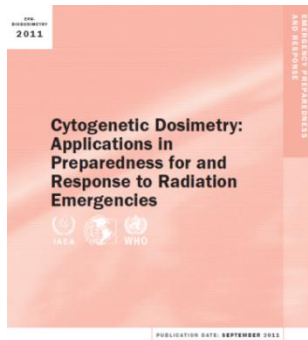
Practical Radiation Technical Manuals are primarily aimed at assisting persons who have a responsibility to provide the necessary education and training locally in the workplace on specific topics such as;

*✓ Personal Protective Equipment, Individual Monitoring, Workplace Monitoring, Health Effects and Medical Surveillance.*




# EPR Series

The Emergency Preparedness and Response (EPR) series is a specific series of IAEA publications on emergency preparedness and response.



# EPR Publications






- Capabilities for Response
- Technical Criteria
- Nuclear and/or Radiological Emergencies
- Medical Preparedness and Response
- Public Communications
- Dose Assessment



The screenshot shows the IAEA website's 'Technical tools' section. It features a navigation menu on the left, a main content area with a table of publications, and a right sidebar with 'Resources' and 'Page Links'.

**Technical tools**

The EPR series is a specific series of IAEA publications on emergency preparedness and response. The IAEA has also developed standardised training material associated with the practical manuals.

Series	Title	Published
Establishing and Maintaining Capabilities for Response		
	Lessons Learned from the Response to Radiation Emergencies (1945-2010) (EPR-Lessons Learned) Arabic; English; French; Russian; Spanish	2012
	Considerations in Emergency Preparedness and Response for a State Embarking on a Nuclear Power Programme (EPR-Embarking) Arabic; English; French; Russian; Spanish	2012
	Training Materials on Considerations in Emergency Preparedness and Response for a State Embarking on a Nuclear Power Programme (Training Materials) English	2012
	Preparation, Conduct and Evaluation of Exercises to Test Preparedness for a Nuclear or Radiological Emergency (EPR-Exercise) Arabic; English; French; Russian; Spanish	2005
	Training Materials for Preparation, Conduct and Evaluation of Exercises to Test Preparedness for a Nuclear or Radiological Emergency (Training Materials) English; Spanish (.zip file)	2006
	Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency - updating IAEA-TECDOC-953 (EPR-Method) Arabic; English; French; Russian; Spanish	2003
Training Materials	Training Materials for developing a national capability for response to nuclear/radiological emergencies	

The IAEA has also developed standardised training material associated with the practical manuals, many of which are available via:  
<http://www-ns.iaea.org/tech-areas/emergency/technicalproducts.asp?s=1>

# EPR Publications



The screenshot displays the IAEA Publications website interface. At the top, the IAEA logo and name are visible. Below the navigation bar, the page title 'Emergency Preparedness and Response' is centered. A left-hand sidebar contains a 'IAEA Publications' menu with options like 'IAEA Books: Home', 'Search Books', 'Series', 'Non-Serial Publications', 'Subject Areas', 'Newsletters', 'Nuclear Fusion', and 'Publications Catalogue'. The main content area features a grid of publication cards, each with a cover image, title, subtitle, and a 'Read more' button. The cards include titles such as 'Actions to Protect the Public in an Emergency due to Severe Conditions at a Light Water Reactor ...', 'Method for Developing a Communication Strategy and Plan for a Nuclear or Radiological Emergency ...', 'EPR-Research Reactor - Generic Procedures for Response to a Nuclear or Radiological Emergency at Res ...', 'Cytogetic Dosimetry: Applications in Preparedness for and Response to Radiation Emergencies ...', 'Considerations in Emergency Preparedness and Response for a State Embarking on a Nuclear Power Progr ...', 'Medical Preparedness and Response for a Nuclear or Radiological Emergency ...', and 'Portable Digital Tool for Assisting First Responders to a Radiological Emergency ...'.

Emergency Preparedness and Response: <http://www-pub.iaea.org/books/IAEABooks/Series/124/Emergency-Preparedness-and-Response>