

# International Framework for Protection of Emergency Workers and Helpers in a Nuclear or Radiological Emergency

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**IAEA**

International Atomic Energy Agency

# Introduction

- Requirement 11:

The government shall ensure that arrangements are in place to protect **emergency workers** and to protect **helpers** in a nuclear or radiological emergency.

IAEA Safety Standards  
for protecting people and the environment

Preparedness and Response  
for a Nuclear or  
Radiological Emergency

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General Safety Requirements  
No. GSR Part 7



# Objective

- Understand:
  - ✓ Who emergency workers are, their rights and duties
  - ✓ Who helpers in an emergency are, their rights and duties
  - ✓ Commitments, responsibilities and duties of employers providing emergency workers
  - ✓ Framework for protection of emergency workers and helpers

# Contents

- Defining emergency workers and helpers
- Overview of the rights, duties and responsibilities in ORP
- Framework for protection of emergency workers and helpers based on Safety Requirements
- Prepare to meet Safety Requirements

# Who is an emergency worker?

*“A person having specified duties as a worker in response to an emergency.”*

- ✓ **Designated** operating personnel
  - ✓ **Directly and indirectly employed**
- ✓ **Designated** personnel of response organizations
- ✓ **Designated** personnel providing care and support to affected population
- ✓ **Other emergency workers who may not necessarily be designated prior to emergency**



# Who is an emergency worker?

*“A person having specified duties as a worker\* in response to an emergency.”*

The definitions recognize rights, duties and responsibilities of both emergency workers and their employers:

- **Worker** is any person who works, full time, part time or temporarily, for an employer and who has **recognized rights and duties** in relation to occupational radiation protection
- **Employer** is a person or organization with **recognized responsibilities, commitments and duties** towards a worker in the employment of the person or organization by virtue of a mutually agreed relationship.

# Designation of emergency workers

- Designation of emergency workers as such at the preparedness stage provides **basis for adequate and prompt discharge of assigned rights, duties, responsibilities and commitments** when needed
- Gives recognition that **some emergency workers**, who are not designated as such prior to emergency, **may not necessarily be workers** with recognized rights and duties in occupational radiation protection **prior to emergency**

# Who are helpers in emergency?

*“Members of the public who willingly and voluntarily help in response to a nuclear or radiological emergency.”*

- ✓ Helpers **are aware** that they may be exposed to radiation while helping in response to nuclear or radiological emergency





# Framework for protection of emergency workers and helpers

- **Designate** emergency workers
- Assess initial and continuous **fitness for duty** of designated emergency workers
  - Provide a system for provision of **health surveillance** prior to their employment as emergency workers and continuously thereafter

# Framework for protection of emergency workers and helpers (cont.)

- Account for emergency workers who cannot be designated as such at preparedness stage and account for helpers
  - Put arrangements in place for **their registration and integration** in the emergency response operations
  - **Identify and designate response organization(s)** responsible for protection of non-designated emergency workers and helpers

# Framework for protection of emergency workers and helpers (cont.)

- **Assess the anticipated hazardous conditions** in which emergency response functions are to be performed by emergency workers
  - Both on-site and off-site
  - In this regard, account for shared responsibilities among operating organizations and response organizations at all levels

# Framework for protection of emergency workers and helpers (cont.)

- As an employer, use these results of this assessment **to identify needs** and **to put arrangements in place** for:
  - Provision of **training** for designated emergency workers
  - Provision of **'just-in-time' training** for non-designated emergency workers and helpers
  - Provision of **specialized PPE** and **monitoring equipment**
  - Provision of **iodine thyroid blocking** when appropriate



# Framework for protection of emergency workers and helpers (cont.)

- As an employer, use these results of this assessment **to identify needs** and **to put arrangements in place** for:
  - **Managing, controlling and recording doses** received by emergency workers and helpers
    - Including application of specific dose restrictions
  - Obtaining **informed consent** by emergency workers for specific tasks
  - Provision of **medical support** to emergency workers and helpers when needed

# Framework for protection of emergency workers and helpers (cont.)

- Provision of medical support to all emergency workers and helpers includes:
  - Longer term medical follow up or medical examination and treatment as appropriate based on doses received in the response
  - Medical care and psychological counselling
- To be ensured by employer (for emergency workers) or designated organization (for helpers)
  - Or at the request by emergency worker or helper



# Framework for protection of emergency workers and helpers (cont.)

- To extent possible, emergency workers need to be protected according to requirements for occupational exposure in planned exposure situation
  - Respecting the dose limits for occupational exposure
- Exception is for the following tasks:
  - Life-saving actions or actions to prevent serious injury
  - Actions to prevent severe deterministic effects or a development of catastrophic conditions that could significantly affect people and the environment
  - Actions to avert a large collective dose

# Framework for protection of emergency workers and helpers (cont.)

- Employers need to ensure that exceeding the dose limits for occupational exposure in planned exposure situation for emergency workers is done:
  - Voluntarily
  - After emergency workers have been informed on associated health risks and available protective measures
  - For emergency workers who are trained in actions they might be required to take



# Framework for protection of emergency workers and helpers (cont.)

- Arrangements for managing doses received in emergency need to consider:
  - **Identification of tasks** for which doses might be received by emergency workers exceeding the dose limits for occupational exposure in a planned exposure situation
  - Setting **national guidance values for restricting further exposure** of emergency workers for different groups of tasks
  - Means to minimize exposures due to weakly penetrating radiation and due to intakes or skin contamination

# Guidance values for restricting exposure of emergency workers (Appendix I)

- Doses due to external penetration radiation ( $H_p(10)$ ) may not provide a sufficient measure of hazard for emergency workers ( $E$  and  $AD_T$  to be assessed promptly and used for that purpose)

TASKS	GUIDANCE VALUES		
	$H_p(10)$	$E$	$AD_T$
Life saving actions	< 500 mSv	< 500 mSv	$< \frac{1}{2}AD_{T, SDE}^a$
	This value may be exceeded — with due consideration of generic criteria used for taking actions to prevent severe deterministic effects to occur — under circumstances in which expected benefits to others clearly outweigh emergency worker's own health risks, and emergency worker volunteers to take action and understands and accepts these health risks		
Actions to prevent severe deterministic effects and actions to prevent development of catastrophic conditions that could significantly affect people and environment	< 500 mSv	< 500 mSv	$< \frac{1}{2}AD_{T, SDE}$
Actions to avert a large collective dose	< 100 mSv	< 100 mSv	$< \frac{1}{10}AD_{T, SDE}$

# Framework for protection of emergency workers and helpers (cont.)

- **Emergency workers** who were **not designated** as such prior to emergency cannot be first choice for life-saving actions
- Helpers need to be protected within provisions for occupational exposure in planned exposure situation (not exceeding 50 mSv effective dose for their duties)

# Framework for protection of emergency workers and helpers (cont.)

- Employers and designated organizations need to promptly **communicate the doses received** in the emergency and **associated health risks** to emergency workers and to helpers

# Protection of female emergency workers

- Severe deterministic effects to a fetus can possibly occur following an equivalent dose to the fetus of greater than 100 mSv
- Female emergency workers who are or who may be pregnant need to be:
  - Informed of this risk
  - Excluded from taking actions that might result in an equivalent dose to the embryo and fetus exceeding 50 mSv for the full period of in utero development

# Further occupational exposure

- Doses received in emergency response are considered separately from occupational exposure in planned exposure situation
- Emergency workers who receive doses in an emergency response **are not to be precluded from incurring further occupational exposure**
  - Such decision need to be based on **qualified medical advice** to assess worker's **fitness for duty**
  - The qualified medical advice to be provided for effective doses received above 200 mSv or at the request of emergency worker



# Protection of emergency workers and helpers in the transition phase

- Characterized with **increased knowledge and understanding of situation**
- **No urgency** in decision-making
- **Detailed planning** of emergency work **doable**
- **Helpers involvement** more **likely**

# Protection of emergency workers and helpers in the transition phase

- **More stringent provisions** such as for planned exposure applicable for most emergency work
- Simultaneous implementation of different schemes for protection of emergency workers and helpers possible



# Protection of emergency workers and helpers in the transition phase

- Once the emergency is terminated, all workers undertaking relevant work are to be subject to relevant requirements for occupational exposure in planned exposure situations

# Prepare to meet Safety Requirements

- GSR Part 7 to great extent follows GS-R-2 regarding protection of emergency workers
- Still, several aspects are new:
  - Designation of emergency workers
  - Assessment of their fitness for duty
  - Dealing with non-designated emergency workers

# Prepare to meet Safety Requirements

- Dealing with helpers
- Provision of 'just-in-time' training
- Application of  $E$  and  $AD_T$  (in addition to  $H_p(10)$ ) to assess need for further restriction of exposure by emergency workers
- Approach to provision of medical support to emergency workers and helpers

# Prepare to meet Safety Requirements

- Assess existing arrangements at the national level to protect emergency workers:
  - How resilient are they against a range of hazardous conditions in which the emergency work may need to be taken?
  - To what extent do they address the revised Safety Requirements?
  - What else does need to be done and how best this can be achieved?

# Prepare to meet Safety Requirements

- Protection of emergency workers needs to build upon existing occupational radiation protection (ORP) measures for normal operations but:
  - *It needs to account for specifics of emergency and emergency response to provide for protection of emergency workers under a range of hazardous conditions!*

# Prepare to meet Safety Requirements

- Work closely with all organizations and services to help identifying and designating emergency workers
- Acknowledge respective rights, duties and responsibilities in ORP among employers and emergency workers
  - Full commitment by employers as well as emergency workers and helpers is essential

# Prepare to meet Safety Requirements

- Account at national levels that emergency workers may be provided from different organizations and services
  - *They all need to be consistently protected in line with their expected duties!*
  - *Work closely with all these organizations and services!*

# Prepare to meet Safety Requirements

- Assess how helpers can be integrated in an emergency response operations:
  - For what type of work they may be engaged?
  - How they can be engaged?
    - Where volunteers from the public may express their interest and willingness to help?
    - What information and instructions would they be provided with?
    - For what organization(s) or work will they be directed to?
  - How can they be informed on their rights, duties and responsibilities and trained?

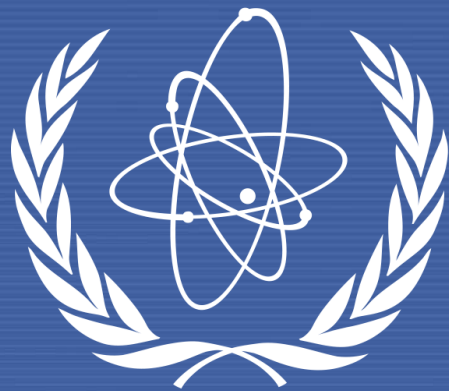




# Prepare to meet Safety Requirements

- Female emergency workers:
  - Establish arrangements for:
    - Voluntarily **notification** by female worker to employer
    - Providing information by employer on **health risk to fetus**
    - **Assessing and monitoring conditions** in which female emergency worker might perform assigned emergency tasks
      - **Restrict involvement** when received doses are anticipated to be greater than 50 mSv equivalent dose to fetus
    - Provision of adequate protective and monitoring equipment
    - Assessment of equivalent dose to fetus as basis for further work restrictions and identifying need for medical consultation

*Thank you for your attention!*



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