

# ISOE EG-SAM Interim Report

## Overall Approach on Emergency Workers/ Responders Protection

**Report on behalf of the Sub expert  
Group**

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## Chapter Content

Work planning procedures and exposure control are tools for occupational radiation protection for workers during normal operation.

Also under severe accident conditions these tools are important but they must be adjusted because of:

- Less time for planning and decisions
- stressful situation
- Missing detailed knowledge of radiological conditions
- working in high dose rate fields
- Internal exposure

## Chapter Content

Subchapters of chapter 5 “Overall approach on emergency workers/ responders protection”

- Individual Exposure Reference Level
- General Protective Measures
- Work planning, Work Permits, and Work Execution and Control
- Radiological Exposure Control
- Non- Radiological health aspects
- Health Surveillance

## Contributors to the Chapter

- Canada
- Finland
- France
- Germany
- Spain
- Slovak Republic
- Sweden
- United States of America

## Guidance Values

- Different approaches for defining guidance values
  - For different types of measures
    - Lifesaving, mitigation actions , recovery measures
  - For different categories of emergency workers/ responders
    - fire brigade, the shift or the monitoring group
  - just one single guidance value
- Discussion points:
  - Guidance value for recovery measures
  - Guidance value for life time dose

## Work Planning (1)

- Adjustment of the work planning process during a severe accident (5.3)
  - Planning principles
  - Planning process
  - Work instructions
  - Radiological conditions
  - Selection of PPE
  - Iodine prophylaxis

## Work Planning (2)

- Planning principles
  - Keeping the dose below the guidance value that have been set
  - implementing the ALARA principle
    - Minimize the risk for internal exposures by the use of adequate breathing protection;
    - Minimize the risk for external contamination by the use of adequate protective clothes;
    - Minimize the risk for high dose to the thyroid gland by the use of iodine prophylaxis;
    - The RP Manager shall estimate the highest resulting individual doses received during the operation. Also other risks shall be taken into account

## Work Planning (3)

- Work instructions in written format/ checklists
  - PPE and needed dosimeters
  - clear instruction how to reach the work place as access routes used during normal operation might no more be appropriate /available during the emergency, e.g. due to high dose rates, high contaminations, inaccessibility;
  - main radiological conditions, especially to verify the radiological conditions assumed during the planning/ before start of / during conduct of work;
  - main issues (e.g. risks and hazards, urgency of work) to be addressed during the work briefing and later work de-briefing;
  - needed tools and equipment and where to find this equipment;
  - lines of communication and reporting;
  - further supporting material as maps, technical plans, photos.

## Work Planning (4)

### Planning process

- Emergency measures, which have been pre-planned as part of the precautionary activities, should follow the same principles as the planning process for measures for normal operations .
- For measures, planned during the emergency, a more simplified process is needed to take into account the specific limiting conditions of the emergency scenario
  - missing detailed knowledge on the radiological situation at work places
  - limited time with respect to a detailed (iterative) planning process

## Work Planning (5)

- Predefined action levels related to radiological conditions should be in place to initiate protective measures, e.g.:
  - Use of personnel protective equipment
  - Intake of potassium iodine
- Using easy decision tools
  - Tables , software

# Radiological Exposure Control (1)

## Radiological exposure control (5.4)

- Same elements as during normal operation are required
  - Measurement of external and internal exposure
  - Warning of high dose rate
  - Documentation
- Good practice, each worker will be equipped with a passive **and** an electronic personal dosimeter. (note, that very often for electronic dosimeters larger limitations exist with respect to the technical conditions (e.g. temperature, humidity))
- Monitoring radiological conditions at the work place

## Radiological Exposure Control (2)

### Internal exposure/ measuring system (5.4.2)

- Unless the Whole Body Counter or Thyroid Counter is appropriately designed with a full shield surrounding the detectors, it will over-respond or has reduced sensitivity under accident conditions which increase the background at the counter location.
- Mobile or transportable systems should be available
- The internal contamination measurement facility should be prepared to handle large numbers of people.

## Chapter Conclusions

- Individual worker/responder protection, including the establishment of individual exposure reference levels, extensive work planning and control, and thorough radiological exposure controls are necessary to maintain emergency worker/ responder radiation exposure ALARA.