

The logo for the Occupational Safety and Health Administration (OSHA) is centered on the page. It features the letters "OSHA" in a large, white, serif font with a 3D effect. The letter "O" is stylized as a blue and white circular graphic. A registered trademark symbol (®) is located to the upper right of the letter "A". The background is a close-up of the stars and stripes of the United States flag, with the stars appearing as dark, jagged shapes against a lighter background.

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**Occupational Safety
and Health Administration**

Responder Safety and Health: Radiological Incidents

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Types of Radiological Incidents

- Nuclear Power Plant release
 - SOE / PLE 3-10 exercise
- Radiological Dispersal Device (RDD)
 - “Dirty Bomb”
 - TOPOFF 4 Full-Scale Exercise
 - Liberty RadEx
- Improvised Nuclear Device (IND)
 - Nuclear Detonation

Safety & Health Hazards

- **Physical Hazards** (from RDD/IND Blast)
 - Collapsed/unstable buildings/structures
 - Heat, smoke, and fires
 - Debris, shrapnel, sharp edges, glass
 - Electrical hazards
 - Blast pressure/wind (from IND detonation)
 - Thermal radiation/flash burns (from IND detonation)
- **Chemical Hazards**
 - Myriad of hazmat, industrial & unknown chemicals
- **Radiation Hazards**
 - Dispersed radionuclides – Ionizing Radiation
 - Nuclear fission process (from IND detonation)
 - Radioactive fallout

Radiation Exposure/Dose Limits

- Emergency Worker Guidelines in Early Phase
 - DHS FEMA Planning Guidance for Protection & Recovery Following RDD & IND Incidents (based on EPA PAG Manual)
 - Federal Register Vol. 73, No. 149, August 1, 2008

Total Effective Dose Equivalent Guideline	Activity
5 rem	Basic response activities All occupational exposures
10 rem	Protecting valuable property
25 rem (or higher)	Life-saving or protection of large populations

Radiation Exposure/Dose Limits

- Emergency Worker Guidelines in Early Phase
 - Incident Commander's call & need to justify
 - ALARA Concept = Guiding Principle
 - Benefit / Risk (Lives Saved / Responders' Lives Lost)
 - Ability of responders to continue response operations
 - Responders fully informed of radiation risks
 - Voluntary basis when dose exceeds 5 rem
- Other Radiation Standards
 - NCRP Report No. 138: 50 rem limit for life-saving
 - OSHA Ionizing Radiation Standard (29 CFR 1910.1096): 1.25 rem/quarter or 5 rem/year

Hazard Evaluation

- Radiation modeling products
 - IMAAC, FRMAC, DOE
- Radiation monitoring instruments
 - Radiation dosimeters, including direct-reading
 - Electronic alarm dosimeters
 - Film badges & TLDs (need lab analysis)
 - Survey Instruments: GM counter, Ion chamber
- Biological monitoring/dosimetry
- Chemical exposure monitoring

Hazard Controls

- Health & Safety Plans (HASPs)
 - Job Hazard Analyses (JHAs)
 - Decontamination procedures
- Hierarchy of Controls
 - Engineering controls
 - Administrative controls (including SWP's)
 - Personal Protective Equipment (PPE)
- Basic Radiation Safety Controls
 - Time
 - Distance
 - Shielding

Managing Safety & Health: Key Issues

- Incident Commander Decision-Making
- ALARA Concept
- Benefit / Risk
 - Lives Saved / Responders' Lives Lost
- Availability of Critical Resources, such as:
 - Trained response workers
 - Ability of responders to continue operations
 - Health Physicists/Radiation Safety Officers
 - Direct-reading radiation dosimeters

Managing Safety & Health: Key Issues

- Data Management
 - Radiation & chemical exposure/dose monitoring
 - Injuries & illnesses
- Medical & Behavioral Health Monitoring
- Training, including HAZWOPER
- Exercises
- Preparedness & Planning
- NSS IND Responders' Safety Workgroup
 - Co-Chairs: OSHA & DHS; Interagency Reps



RDD/IND Planning Guidance

- Planning Guidance for Response to a Nuclear Detonation (Second Edition; June 2010; by NSS Interagency Policy Coordination Subcommittee for Preparedness & Response to Radiological and Nuclear Threats)
- DHS FEMA Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents (Federal Register; Vol. 73, No. 149; Friday, August 1, 2008)
- National Council on Radiation Protection and Measurements (NCRP) Reports:
 - Key Elements of Preparing Emergency Responders for Nuclear and Radiological Terrorism (NCRP Commentary No. 19; December 31, 2005)
 - Management of Terrorist Events Involving Radioactive Material (NCRP Report No. 138; October 24, 2001)
- NIOSH Guidance on Emergency Responder PPE for Response to CBRN Terrorism Incidents (NIOSH Publication No. 2008-132; June 2008)

