

What Responders Need to Know About Radiation

Professional Personnel

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Fact Sheet #19

Division of Environmental Health
Office of Radiation Protection



It is possible that first responders to the scene may not recognize the radiological aspects of an event. It is recommended that emergency response personnel or response vehicles likely to be the first to respond to a scene be equipped with radiation detection equipment that would alert the responders they are entering a radiologically compromised environment. Emergency response personnel assigned to a scene with this equipment should be trained to operate the equipment and understand what the risks associated with exposure to radiation are. Radiation detection equipment should always be employed when first responders arrive on a scene for which there has been some indication that the area is contaminated with radioactive materials and to any site of an explosion.

Emergency response radiation exposure limits are the same as occupational workers annual exposure limits. 5 Rem (50 mSv) is the accepted exposure limit for emergency responders. For emergency workers to exceed 5 Rem requires a review and approval of the State Health Officer. Other limits requiring State Health Officer's approved exceptions are as follows:

Action	Dose Limit
For protecting property	10 Rem (100 mSv)
For life saving	25 Rem (250 mSv)
For life saving missions beyond 25 Rem	Any actions taken will be voluntary*

*Only volunteers fully aware of the risks should request exceeding this limit.

Radiation exposure can be from an external source, an internal source, or a combination of both. If radiation is present, there is also a good chance that the radioactive material is dispersed throughout the event scene. When radioactive contamination is deposited internally there is a constant source of exposure that normal counter measures such as time, distance, and shielding will not achieve. For emergency response personnel, the primary pathway for radioactive contamination to enter the body is by inhalation. Respiratory protection and Personal Protective Equipment (PPE) are the best methods to control the intake of radioactive contamination.

Zoning the event scene into Hot, Warm, and Cold Zones will help reduce radiation exposures and aid in controlling the spread of radioactive contamination. The size of the event scene will determine the size of the zones and the control points needed. The Hot Zone barrier should be established where the radiation dose rate is below 5 mRem/hr (0.05 mSv/hr). If other hazardous conditions exist, the Hot Zone barrier can be established at a lower dose rate. The outer perimeter of the Warm Zone should be established where contamination levels are at background levels when measured with a count rate meter. If this is not practical because of the size of the event, adjustments can be made if deemed necessary. The Warm Zone can be utilized for decontamination efforts. The Cold Zone barrier should be established at a location that all access to and from the Warm Zone will be continuously monitored and all personnel are accounted for.

The Department of Health, Office of Radiation Protection maintains a 24-hour notification system for emergency response to a radiological incident. During normal work hours a call to 206-NUCLEAR will go directly to emergency response staff. During off hours the call will be directed to an answering service that has procedures to immediately contact the Emergency Response Duty Officer (ERDO). The ERDO will return the call to the contact and determine the necessary Office of Radiation Protection response activities.

Sources

NCRP Report No. 138
ORAU "Transport of Radioactive Material" REAC/TS Medical Sciences Division
"Radiological Emergency Response Plans and Procedures", Washington State
Department of Health, Office of Radiation Protection

Links to external resources are provided as a public service and do not imply endorsement by the Washington State Department of Health.