



M E R R T

Decontamination, Disposal, & Documentation

notes

RADIOACTIVE CONTAMINATION

Radioactive contamination is undesired radioactive material deposited on the surfaces of or inside structures, areas, objects, or people. Radioactive material can be solid, liquid, or gaseous. If radioactive material is released from a package, personnel, personal protective equipment (PPE), apparatus, and tools can become contaminated if they contact this material. When individuals (accident victims or response personnel), PPE, or equipment become contaminated, the contamination can easily be spread by cross-contamination or secondary contamination to other persons, equipment, or surfaces. Care should be taken to avoid cross-contamination. The following practices will help to avoid spreading contamination:

- Change gloves after handling accident victims and contaminated equipment
- Avoid unnecessary activity in the contaminated area
- Sleeve or wrap equipment prior to entry into the area
- Adhere to the policy of no eating, drinking, smoking, or chewing in the hot zone
- Avoid touching unprotected skin areas

Performing a thorough contamination survey on individuals and equipment exiting the hot zone can also help minimize the spread of contamination.

Personnel can become contaminated internally, externally, or both. Internal contamination occurs when radioactive material is ingested or inhaled or otherwise taken into the body. External contamination occurs when radioactive material gets on you or your clothing.





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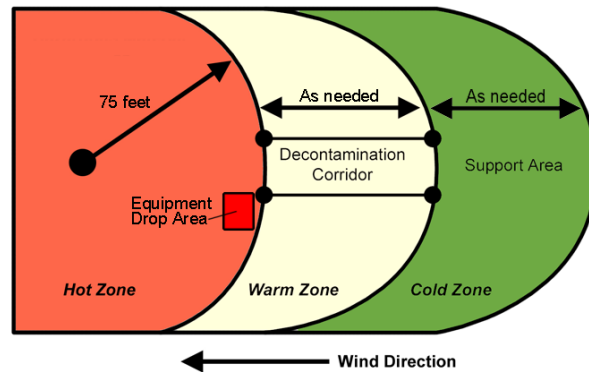
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FIELD DECONTAMINATION SET-UP

If field decontamination is necessary, it is important to establish a decontamination station/area. As with other hazardous material incidents, the decontamination corridor is usually established inside the warm zone running between the hot zone and cold zone. The Incident Commander and Safety Officer will determine where the decontamination corridor should be established and will consider the following:

- Wind direction relative to incident scene
- Background radiation levels
- Hot, warm, and cold zone boundaries
- Areas for best access into and out of incident scene



The decontamination corridor will need the following:

- **Equipment drop area** (inside hot zone) - This is where tools, equipment, etc., should be set down to wait for radiological survey. A small piece of plastic or poly can be placed on the ground to define the drop area. The plastic or poly will also serve to protect the ground from secondary contamination from equipment.





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- **Clothing removal station** - This is where protective clothing will be removed and placed into appropriate containers (provide plastic lined containers).



- **Radiological survey station** - This is the area where, after removing protective clothing, personnel are surveyed for radiological contamination. Radiological surveys need to be performed by qualified individuals. Personnel who are contaminated must go to the decontamination station. Personnel who survey “clean” will be allowed to exit into the cold zone. If you suspect that personnel exiting the hot zone may not be contaminated, you may want to consider surveying them prior to removal of their protective clothing. If personnel survey clean while wearing their protective clothing, the clothing will not need to be disposed of as radioactive waste. Personnel should be surveyed again after removal of their protective clothing.



- **Decontamination station** - This is where personnel decontamination is performed. After decontamination, personnel will return to the radiological survey station for a second survey to determine the effectiveness of the decontamination effort.

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EQUIPMENT DECONTAMINATION

Equipment decontamination involves removing radiological contamination from equipment. Not all equipment can be decontaminated (e.g., straps, porous material, equipment with inaccessible areas). Some preplanning before taking material into the hot zone can help prevent equipment from becoming contaminated. For example, equipment can be placed in a clear poly bag before being taken into the contaminated area. Upon exit from the area, the contaminated bag can be removed and disposed of. Radiological Control personnel routinely bag radiological survey instruments prior to entering a contaminated area to prevent instruments from being contaminated.

If equipment needs to be decontaminated, consider the following methods:

- **Critical hand-held equipment** - Trained personnel can attempt to decontaminate equipment by wiping it down with a damp, absorbent cloth
- **Critical heavy equipment** - Trained personnel can attempt decontamination using a non-abrasive wash solution

All solid and liquid waste generated during decontamination will need to be controlled, properly packaged, and stored for eventual disposal in accordance with local procedures.



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STOPPING FURTHER RELEASE OF RADIOACTIVE MATERIAL

Minimizing the spread of radioactive material is important during the emergency phase of an incident. This is usually the responsibility of the hazardous material response team. If you are not trained in methods for controlling the spread of radioactive material, DO NOT attempt them. Let properly trained personnel take this responsibility. Some things you can do are:

- Dike or contain any runoff water that may be contaminated
- Ensure that equipment inside the hot zone stays there until surveyed for contamination
- Ensure that all fires are out as soon as possible to limit the spread of radioactive material via smoke

WASTE DISPOSAL

Waste disposal can be a problem at any hazardous material scene. For a radiological incident, processes should be put in place as soon as possible to ensure all radioactive waste is contained.

1. Have plastic-lined waste containers at the entry/exit of the decontamination corridor for disposing of potentially contaminated material. These containers are often the same as for other hazardous material contaminated wastes.
2. Seal the tops of full plastic bags and place them in a holding area inside the hot zone. Ensure that containers are clearly identified as “radioactive” and are properly stored for disposal later.





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DISPOSAL AND DOCUMENTATION RESPONSIBILITIES

Once the initial response phase of the incident is over, the focus will switch to cleanup and disposal of radioactive waste. The carrier is responsible for costs associated with scene cleanup and the disposal of radioactive material/waste. Carriers of radioactive material are required to provide financial protection to the public in the unlikely event of an incident involving radioactive material. The required amount of liability coverage for carriers of radioactive material varies according to the mode of transport (road, rail, waterway, or air) and the type and quantity of radioactive material being shipped. If the damages from a transportation-related accident (radiological) exceed the amount of the carrier's private insurance coverage, umbrella coverage is provided under the Price-Anderson Act.

Event documentation and reporting is an important step in recovering costs associated with a transportation incident involving hazardous material. Time, resources, and property damage must be recorded for payment. Documentation will be the legal evidence necessary in the future. Your documentation must include: who, what, when, where, how, and why.

DOE has a model Hazardous Materials Team Incident Response Procedure available that will assist in documenting response activities. The procedure can be found on the MERRTT CD-ROM or on the TEPP website at <http://web.em.doe.gov/otem/program.html>.



Check Your Understanding



1. Radioactive material can take the form of a _____, _____, or _____.
2. List two reasons for performing radiological decontamination.

3. Personnel _____ is usually accomplished using mild soap and lukewarm water.
4. Which of the following statements is true regarding equipment decontamination?
 - a) Contaminated equipment should be hosed off immediately
 - b) Contaminated equipment should not be taken into the hot zone
 - c) Equipment that is contaminated should be disposed of as radioactive waste
 - d) Not all equipment can be decontaminated
5. For decontamination operations, a _____ is usually established inside the warm zone, running between the hot zone and cold zone.
6. The _____ is responsible for costs associated with scene cleanup and the disposal of radioactive material/waste.
7. Event _____ and reporting is an important step in recovering costs associated with a transportation incident involving hazardous material.

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ANSWERS

1. solid
2. See page 3
3. decontamination
4. d
5. decontamination
6. coordinator
7. documentation