

The DOE Manual (DOE 2002b) expands these criteria and requires notification to the states.

DOE operates a Radiological Assistance Program (RAP) with eight Regional Coordinating Offices staffed with experts available for immediate assistance in offsite radiological monitoring and assessment. DOE RAP teams assist state, local, and tribal officials in identifying the material and monitoring to determine if there is a release and with general support.

Consistent with the DOE Manual (DOE 2002b), DOE has developed the Transportation Emergency Preparedness Program to assist federal, state, tribal, and local authorities to prepare for transportation accidents involving radioactive materials. That assistance includes planning for emergencies as well as training for emergencies. For example, through education programs offered to state and tribal organizations, over 17,000 emergency response personnel in twenty states have been trained to respond to accidents involving radioactive material (Westinghouse 2001). See <http://www.em.doe.gov/otem> for additional information about TEPP.

Like private-sector shippers, DOE must provide emergency response information required on shipping papers, including a 24-hour emergency telephone number. Shippers have overall responsibility for providing adequate technical assistance for emergency response.

Carriers are required to provide emergency planning, emergency response assistance, liability coverage, and site cleanup and restoration. DOE's policy is to respond to requests for technical advice with appropriate information and resources.

Specific information regarding local emergency preparedness can be found through Local Emergency Planning Committees (LEPCs) or State Emergency Response Commissions (SERCs).

2.2.5 Pollution Prevention/Waste Minimization

Consistent with the requirements and guidance of several laws and executive orders, including the Pollution Prevention Act of 1990 (42 USC 13101), DOE performs pollution prevention and waste minimization activities in the work it does. Pollution prevention is defined as the use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and wastes into land, water, and air. Pollution prevention includes practices that reduce the use of hazardous materials, energy, water, and other resources along with practices that protect natural resources through conservation or more efficient use. Within DOE, pollution prevention includes all aspects of source reduction as defined by the EPA, and incorporates waste minimization by expanding beyond the EPA definition of pollution prevention to include recycling.

Pollution prevention is achieved through:

- equipment or technology selection or modification, process or procedure modification, reformulation or redesign of products, substitution of raw material, waste segregation, and improvements in housekeeping, maintenance, training or inventory control

- increased efficiency in the use of raw materials, energy, water, or other resources
- recycling to reduce the amount of waste and pollutants destined for release, treatment, storage, and disposal.

Pollution prevention is applied to all DOE pollution-generating activities including:

- manufacturing and production operations
- facility operations, maintenance, and transportation
- laboratory research
- research, development, and demonstration,
- weapons dismantlement
- stabilization, deactivation, and decommissioning
- legacy waste and contaminated site cleanup.

2.2.6 Decontamination and Decommissioning of Hanford Facilities

Decontamination is the removal, by chemical or physical methods, of radioactive or hazardous materials from internal and external surfaces of components, systems and structures in a nuclear facility. It is usually the first step toward decommissioning. Decommissioning of a nuclear facility can be defined as the measures taken at the end of the facility's lifetime to assure protection of public health and safety and the environment. Such measures can involve protective storage, entombment, or removal. For protective storage, the facility is left intact after removal of most of the radioactive materials and the appropriate security controls are established to assure public health and safety. Entombment consists of removing radioactive liquids and wastes, sealing all remaining radioactivity within the facility, and establishing appropriate security controls to assure public health and safety. For the removal option, all radioactive materials are removed from the site and the facility is refitted for other use or completely dismantled.

2.2.7 Long-Term Stewardship

Cleanup plans and decisions strive to achieve an appropriate balance between contaminant reduction, use of engineered barriers to isolate residual contaminants and retard their migration, and reliance on institutional controls. Decisions are influenced by several factors:

- risks to members of the public, workers, and the environment
- legal and regulatory requirements
- technical and institutional capabilities and limitations
- current state of scientific knowledge
- values and preferences of interested and affected parties
- costs and related budgetary considerations
- impacts on, and activities at, other sites.

Reliance on institutional controls after contaminants have been reduced and engineered barriers have been put in place is referred to as long-term stewardship. Specific long-term stewardship activities depend on the specific hazards that remain and how those hazards are being controlled. Long-term stewardship activities are intended to continue isolating hazards from people and the environment. Specific long-term stewardship activities can include:

- monitoring to verify the integrity of caps placed over disposal sites
- maintaining caps to ensure their continued integrity
- monitoring groundwater and/or the vadose zone to determine whether systems that contain hazardous materials are performing as expected
- monitoring for surface contamination
- monitoring animals, plants, and the ecosystem
- performing groundwater pump-and-treat operations
- installing and maintaining fences and other barriers
- posting warning signs
- establishing easements and deed restrictions
- establishing zoning and land use restrictions
- maintaining records on clean up activities, remaining hazards, and locations of the hazards
- providing funding and infrastructure (e.g., utilities, roads, communications systems) necessary to support long-term stewardship activities.

DOE does not rely solely on long-term stewardship to protect people and the environment. As indicated in the DOE-sponsored report *Long-Term Institutional Management of U. S. Department of Energy Legacy Waste Sites* (National Research Council 2000), “contaminant reduction is preferred to contaminant isolation and the imposition of stewardship measures.” Contaminant reduction is a large part of the ongoing cleanup efforts at Hanford. The long-term stewardship plan for the Hanford Site was approved in August 2003 (DOE-RL 2003).

2.3 References

10 CFR 61. “Licensing Requirements for Land Disposal of Radioactive Waste.” Code of Federal Regulations. Online at: http://www.access.gpo.gov/nara/cfr/waisidx_01/10cfr61_01.html

10 CFR 71. “Packaging and Transportation of Radioactive Material.” Code of Federal Regulations. Online at: http://www.access.gpo.gov/nara/cfr/waisidx_01/10cfr71_01.html

10 CFR 962. “Byproduct Material.” Code of Federal Regulations. Online at: http://www.access.gpo.gov/nara/cfr/waisidx_02/10cfr962_02.html

40 CFR 761. “Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, and Use Prohibitions.” Code of Federal Regulations. Online at: http://www.access.gpo.gov/nara/cfr/waisidx_01/40cfr761_01.html