

**U.S. Department of Energy**

**EH**

# **MANAGEMENT PERSPECTIVES**



**ON**

## **WORKER PROTECTION DURING DOE HAZARDOUS WASTE ACTIVITIES**

**EM**

**JUNE 1996**

U.S. Department of Energy  
Assistant Secretary for Environment, Safety and Health  
Washington, DC 20585

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Successful work is accomplished within budget, on schedule, in a technically sound fashion, and in a safe and healthful manner.

Conducting work with a multidisciplinary team, including job planning and managing worker health and safety as an integral part of all activities, will facilitate success.

**This guide is written for the project manager, who has overall responsibility for directing hazardous waste activities and ensuring that these activities protect the worker, the public, and the environment. The project manager relies on a multidisciplinary team of specialists to achieve project objectives—the specialists having a working knowledge of the details of hazardous waste activities (e.g., decontamination, medical surveillance, emergency preparedness). However, the project manager must understand the major elements of these activities—this guide assists the project manager in that mission.**

## **MAKING IT SAFE REQUIRES —**

- DOE managers proactively managing safety
- Workers skilled in identifying and controlling hazards
- Workers and managers in partnership

## PURPOSE

*Management Perspectives on Worker Protection During DOE Hazardous Waste Activities* is designed to promote the safe conduct of hazardous waste activities in a cost-effective manner. This document (hereafter referred to as a guide) provides an overview of health and safety requirements and provides guidance that applies to hazardous waste activities throughout the Department of Energy (DOE) complex. The relevant requirements are specified in 29 CFR 1910.120 and 29 CFR 1926.65, “Hazardous Waste Operations and Emergency Response” (the HAZWOPER Standard), and amendments.

Designed as part of the HAZWOPER initiative, sponsored by the Offices of Environment, Safety and Health and Environmental Management, this guide provides guidance to DOE and contractor managers working at hazardous waste worksites. This guide is not intended to stand alone. Other documents developed as part of this initiative include:

- *The Handbook for Occupational Health and Safety During DOE Hazardous Waste Activities*; and
- *Working Safely During DOE Hazardous Waste Activities*.

For additional information, tools, and integrated guidance on the development and cost-effective implementation of the topics discussed in this guide, refer to the Handbook.

This guide describes how the requirements of the Occupational Safety and Health Administration (OSHA), as stipulated in the HAZWOPER Standard, relate to DOE requirements for hazardous waste activities involving radiological or mixed wastes, including 10 CFR 835, “Occupational Radiation Protection.” For purposes of this guide, hazardous waste is defined as radiological, mixed, and nonradiological chemical wastes or substances.

## **ACRONYMS**

<b>CERCLA</b>	<b>Comprehensive Environmental Response, Compensation, and Liability Act</b>
<b>DOE</b>	<b>Department of Energy</b>
<b>EAP</b>	<b>Emergency Action Plan</b>
<b>EMG</b>	<b>Emergency Management Guide</b>
<b>ERP</b>	<b>Emergency Response Plan</b>
<b>HASP</b>	<b>Health and Safety Plan</b>
<b>HAZWOPER</b>	<b>Hazardous Waste Operations and Emergency Response</b>
<b>IUOE</b>	<b>International Union of Operating Engineers</b>
<b>JTHA</b>	<b>Job, Task, and Hazard Analysis</b>
<b>MMES</b>	<b>Martin Marietta Energy Systems</b>
<b>OSHA</b>	<b>Occupational Safety and Health Administration</b>
<b>PPE</b>	<b>Personal Protective Equipment</b>
<b>RCRA</b>	<b>Resource Conservation and Recovery Act of 1976</b>
<b>RWP</b>	<b>Radiological Work Permit</b>
<b>SOP</b>	<b>Standard Operating Procedure</b>
<b>SSHO</b>	<b>Site Safety and Health Officer</b>
<b>SWP</b>	<b>Safe Work Permit</b>
<b>TSD</b>	<b>Treatment, Storage, and Disposal</b>

Figure 1 provides a roadmap for the hazardous waste activities project manager, from the process of planning and preparing work, to conducting work safely, to decontaminating personnel and equipment.

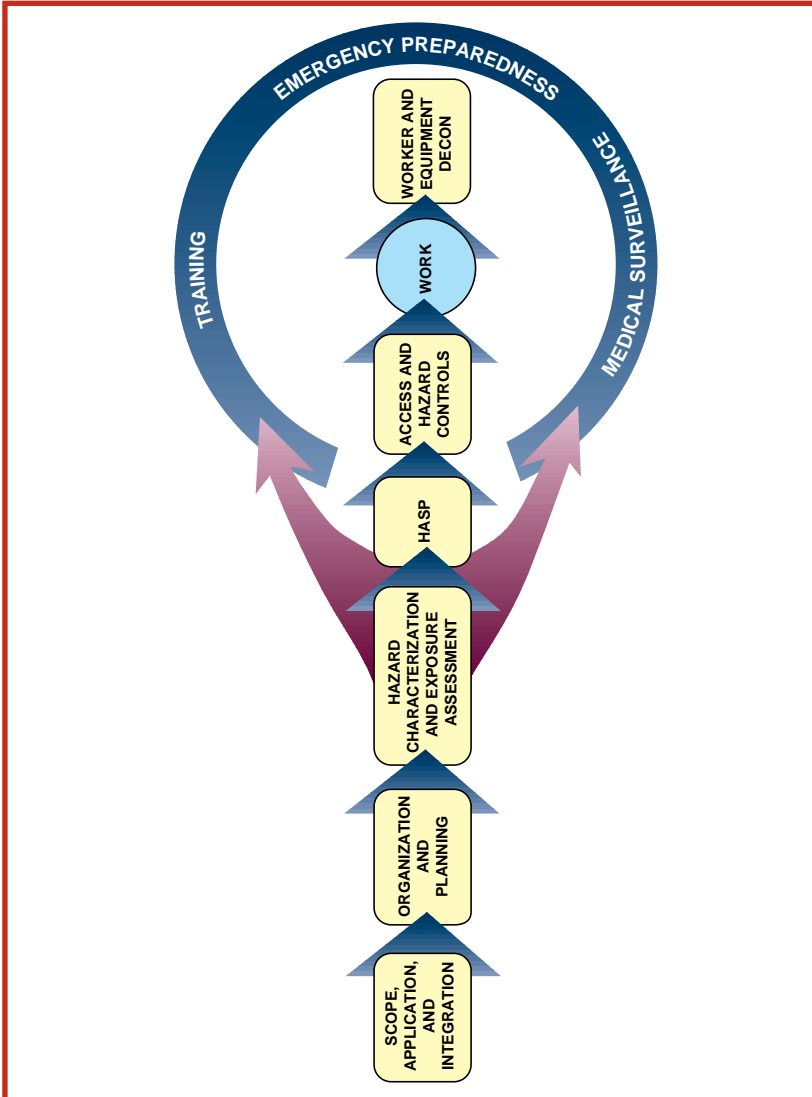


Figure 1. DOE Roadmap for Integrating HAZWOPER.

# SCOPE AND APPLICATION

Scope and application of the HAZWOPER Standard can be determined by making informed judgments about the regulatory status of individual worksites, the nature of activities being performed, and the possibility of worker exposure (see Figure 2).

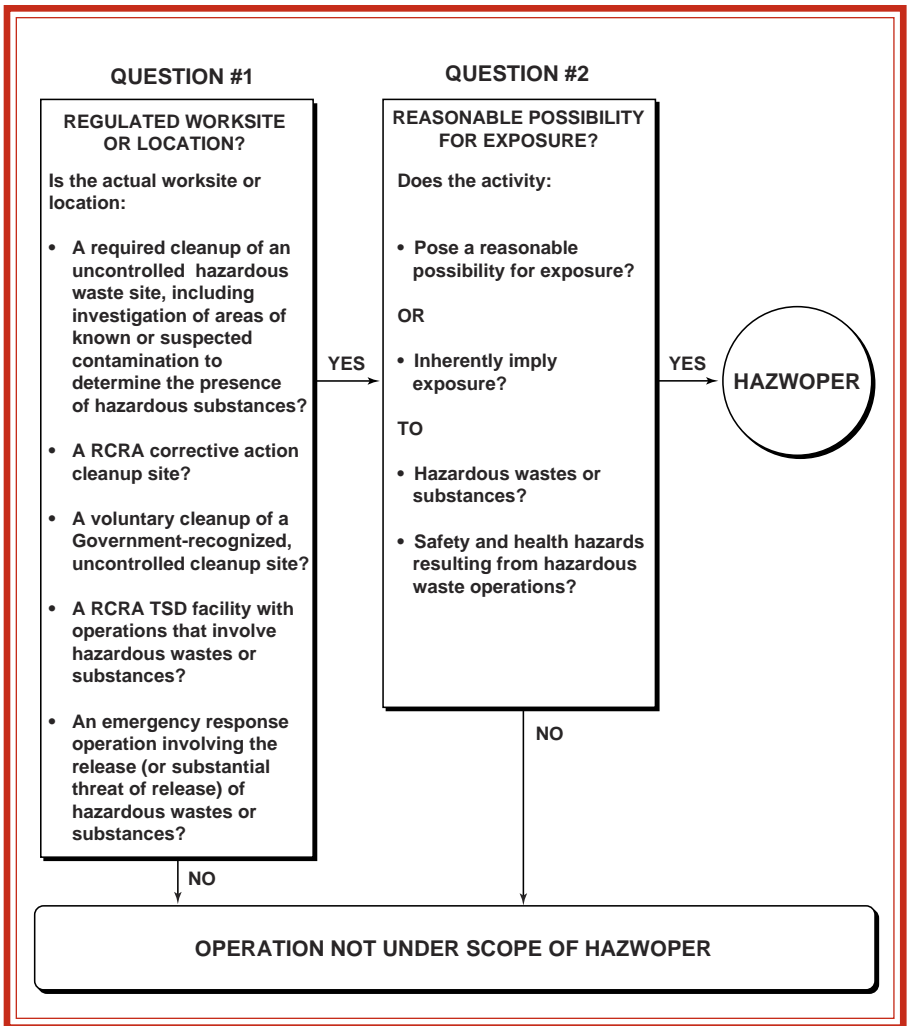


Figure 2. Determining OSHA HAZWOPER Scope.

Once the decision is made that an operation falls under the HAZWOPER Standard, the appropriate paragraphs of the Standard are applied to specific activities. Paragraphs (b) through (o) apply to environmental remediation and corrective actions, paragraph (p) applies to Resource Conservation and Recovery Act (RCRA)-regulated treatment, storage, and disposal (TSD) facilities, and paragraph (q) applies to certain emergency responses to releases (or threats of releases) of hazardous wastes or substances, without regard to location.

**DOE may apply the HAZWOPER Standard worker protection program elements or framework to the following activities —**

- **Deactivation**
- **Certain decontamination and dismantlement activities that do not fall under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**
- **Surveillance and maintenance activities**
- **Non-RCRA-permitted TSDs**
- **Construction**
- **Laboratory activities**
- **Research and development activities**
- **Satellite accumulation sites**

Figure 3 displays each of the major provisions or paragraphs of the HAZWOPER Standard and their functional relationships. The colored boxes in Figure 3 depict those programmatic requirements that support medical surveillance (blue), training (green), standard operating procedures (SOPs) (yellow), and the site-specific health and safety plan (HASp) (red).



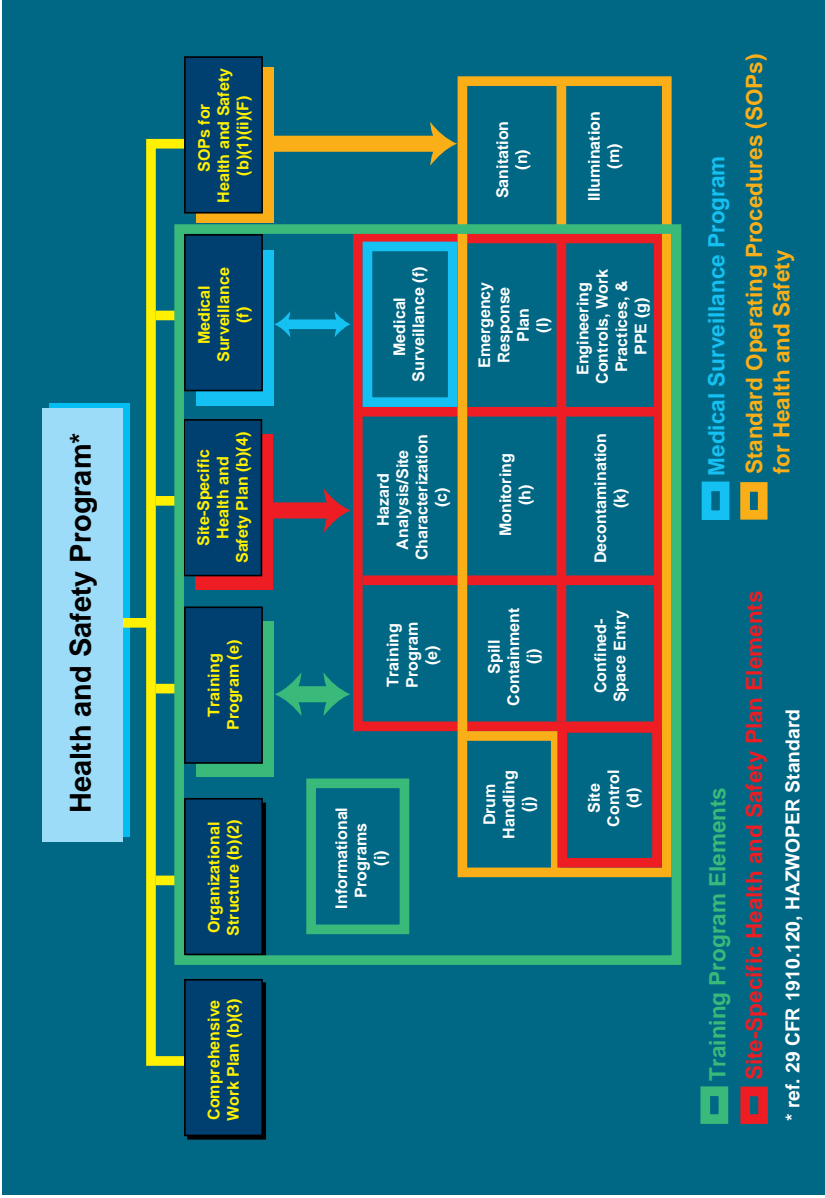


Figure 3. Health and Safety Program for Hazardous Waste Cleanup.

Emergency response operations are required whenever there is an actual or substantial threat of hazardous substance releases. OSHA broadened the scope of the HAZWOPER Standard to apply to cases in which workers have the possibility of exposure to a hazardous waste or substance—not simply to hazardous waste during hazardous waste operations.

For activities outside those addressed explicitly by the HAZWOPER Standard, if a possibility exists for exposure to hazardous wastes during the activities listed above, then the HAZWOPER Standard concept and principles as a framework should be used for managing health and safety activities and programs. This framework involves (1) applying HAZWOPER Standard principles to baseline, task-based, and periodic hazard evaluations; (2) developing an integrated health and safety program supported by a health and safety organization; and (3) incorporating HAZWOPER elements (e.g., training) selectively. For remediation activities to which more than one regulation may apply (e.g., lead, asbestos), DOE will apply the regulation more protective of worker health and safety.

DOE has adopted other OSHA standards that apply to hazardous waste activities. Many OSHA construction standards and general industry standards (e.g., 29 CFR 1910.1200, “Hazard Communication”) are applicable to hazardous work activities.

## EMPLOYEE RIGHTS AND RESPONSIBILITIES

Employers are responsible for providing a workplace free of recognized hazards that may cause death or serious harm to employees. Employees are responsible for complying with all health and safety rules, regulations, and DOE Orders.

### **Personnel assigned to hazardous waste worksites have specific rights —**

- **The right to freely express concerns regarding health and safety issues, including personal safety;**
- **The right to refuse unsafe work without reprisal, harassment, or retaliation;**
- **The right to expect quick resolution of disputes about unsafe work;**
- **The right to gain timely knowledge of hazards;**
- **The right to report concerns or violations;**
- **The right to receive appropriate personal protective equipment (PPE) without charge;**
- **The right to access health and safety information and records;**
- **The right to talk with inspectors, attorneys, physicians, or the media without retaliation;**
- **The right to fully participate with government agencies in all health and safety investigations and inspections; and**
- **The right to expect a commitment to safety excellence.**

**In addition to these rights, workers have the following responsibilities —**

- **The responsibility for knowing and complying with the health and safety regulations established by their employers;**
- **The responsibility to attend required training and, through use, practice, and retraining, to remain current in the skills and knowledge obtained;**
- **The responsibility to properly use, maintain, and care for the PPE assigned to them;**
- **The responsibility to report and remove from service any damaged PPE; and**
- **The responsibility for reporting to their supervisor serious hazards in the workplace.**

## ORGANIZATION AND PLANNING

A variety of management and organizational activities are necessary to plan hazardous waste activities effectively, to define and communicate individual and organizational roles and responsibilities, and to assign appropriate resources to each task.

### Organization-Wide Health and Safety Program

The HAZWOPER Standard requires employers to develop a comprehensive program to protect health and safety at each hazardous waste site. The health and safety program should be documented and should apply to *all* DOE employees, contractors, subcontractors, and visitors at the worksite. The written health and safety program includes —

- An organizational structure;
- A comprehensive work plan;
- An emergency response plan (if not in HASP);
- A site-specific HASP;
- Health and safety training requirements for the jobs being done;
- Medical surveillance requirements; and
- SOPs (or safety procedures) for protecting employees' health and safety.

### Organizational Structure

The roles and responsibilities of all involved personnel and organizational elements are to be clear, effectively communicated, and understood. Under the HAZWOPER Standard, each organization engaged in hazardous waste activities is to produce a formal document that specifies the organizational structure and the overall roles, responsibilities, and authorities of supervisors and employees. This document is to be revised when information impacting roles and responsibilities (e.g., personnel changes, site conditions) changes.

For DOE activities conducted under the HAZWOPER Standard framework, 10 CFR 835 does not require that an organizational structure be established, but the *Draft DOE Radiological Control Technical Standard* identifies overall line management functions and specifies responsibilities of managers involved in radiological control programs.

### **Multidisciplinary Project Team**

Key positions within the project team include the project manager, site safety and health officer (SSHO), field team leader, radiological control manager, and worker representatives. In addition, the command post supervisor, emergency response coordinator, incident commander, decontamination station officer, and workers responsible for site security, radiological control, and other specialized positions are identified. A list of DOE and contractor workers and a list of offsite organizations to be contacted in the event of an emergency are also included.

**A multidisciplinary project team is crucial to —**

- **Define roles and responsibilities, project interfaces, and communication methods;**
- **Determine and interpret applicable regulatory requirements;**
- **Assist in site characterization and data gathering;**
- **Develop integrated hazard characterization and exposure assessment;**
- **Provide input to the work planning process;**
- **Perform job and task breakdowns and review engineering drawings, process flow diagrams, and operational procedures from a hazard analysis perspective;**
- **Incorporate worker knowledge and insights of past jobs and tasks, and their associated hazards;**
- **Develop access and hazard controls for all phases of the project; and**
- **Assist in preparation and revision of HASPs and work plans.**

## Comprehensive Work Plan

Before work begins, a comprehensive work plan is to be developed that identifies required tasks and activities, logistical arrangements, resources, and a schedule for achieving project goals. Each plan is to be reexamined and updated regularly.

### **A comprehensive work plan —**

- **Addresses anticipated cleanup work tasks and objectives as well as normal operating procedures to accomplish tasks, without duplicating existing procedures;**
- **Establishes personnel requirements; and**
- **Implements the requisite training, information, and medical surveillance programs.**

## Health and Safety Plan

Under the HAZWOPER Standard, employers develop and implement a HASP specific to each worksite where personnel may be exposed to hazardous substances. The HASP is developed to build upon and enhance the existing worker protection health and safety programs. It is kept onsite and addresses the safety and health hazards of each phase of site operations and includes the requirements and procedures for worker protection. Subcontractors may expand upon components of the plan (e.g., job, task, and hazard analysis [JTHA]); however, only one plan should apply to each worksite. The use of multiple HASPs is one of the most common deficiencies noted during inspections of remediation activities at hazardous waste sites. The HAZWOPER Standard lists elements to be included in a site-specific HASP (see Figure 4).



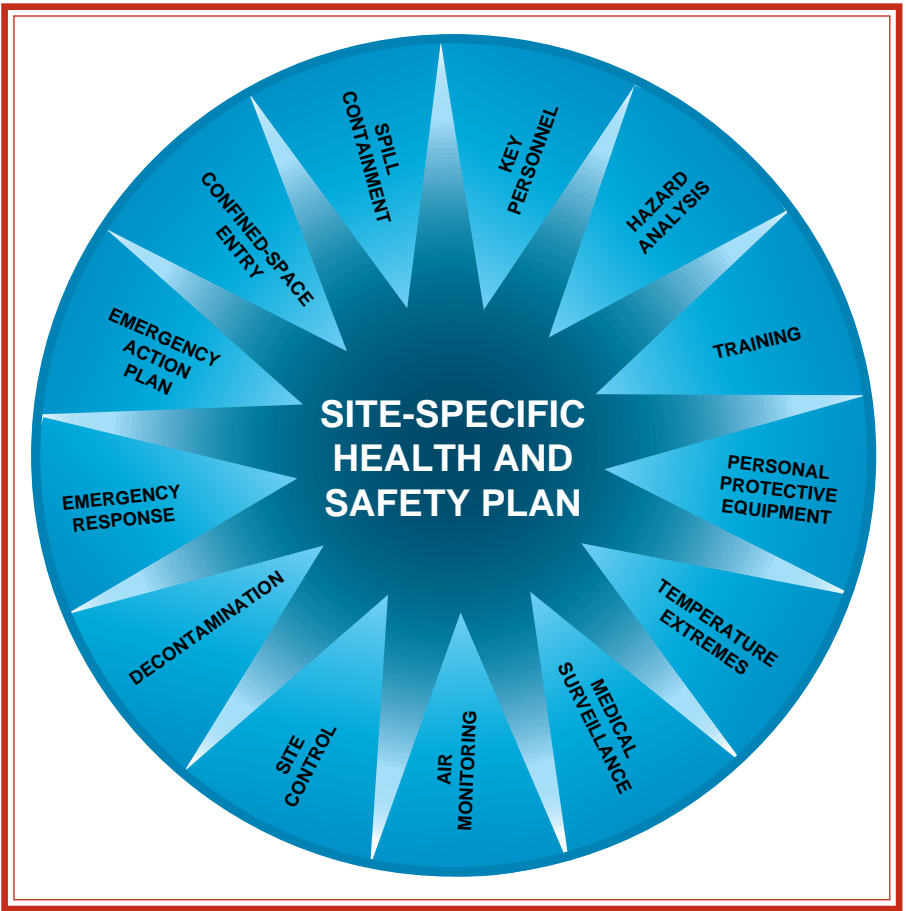


Figure 4. The HASP Wheel.

## Preliminary Evaluation

A HASP also delineates the responsibilities, authorities, and accountabilities of the organizational elements involved in the activity. The first step in developing the HASP is to perform a preliminary evaluation of worksite hazard characteristics. This process is conducted offsite to avoid endangering workers.

## **Preliminary evaluations are conducted to determine —**

- **Location and size of site;**
- **Description and duration of planned activity;**
- **Site topography and accessibility;**
- **Expected health and safety hazards;**
- **Pathways for hazardous-substance dispersion;**
- **Status and capabilities of emergency response teams; and**
- **Properties and potential health hazards of hazardous substances expected at the worksite.**

Once the evaluation has been completed, the HASP can be prepared. For each operation or activity, the HASP identifies all anticipated health and safety hazards and describes how each hazard can be prevented, eliminated, or controlled. The appropriate protocol for the technical review and line management approval of HASPs should be determined. A procedure is also to be in place to enable timely changes to a HASP (e.g., in response to changes in the comprehensive work plan or in site conditions). Health and safety professionals at the worksite should evaluate the acceptability of all proposed changes. The process of HASP development and its relationship to initial site entry and commencement of hazardous waste activities is depicted in Figure 5.

## **Standard Operating Procedures**

While the HASP is the dominant work control document governing a hazardous waste worksite, SOPs, safe work permits (SWPs), and radiological work permits (RWPs) can be effectively integrated. This consolidates key information related to environment, safety, health, and radiological hazards, controls, and requirements, along with responsibilities and accountabilities of the work team. Functional areas for which SOPs are to be implemented are depicted in Figure 3.

# Site-Specific Health and Safety Plan Development Over Time

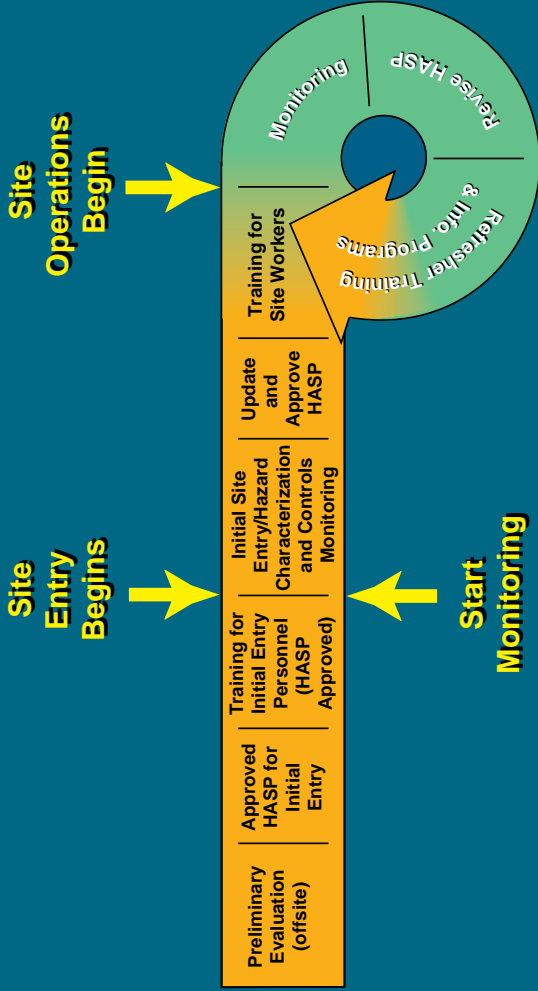


Figure 5. HASP Development Continuum.

Training is an essential element of any successful work activity, providing workers with information necessary to recognize and control hazards while getting the work completed. The general elements to be addressed by the training program are depicted in Figure 3.

### **Worker Training**

Workers may not be permitted to participate in or supervise field activities until they have been trained to a level required by their job functions and responsibilities.

Two levels of training are required for workers at a hazardous waste site. Hazardous waste workers are required to complete a minimum of 40 hours of classroom training and 3 days of supervised field experience. Occasional hazardous waste workers and those who are restricted to areas where contaminant exposure has been documented to be below acceptable threshold levels are required to complete 24 hours of classroom training and 1 day of supervised field experience. The HAZWOPER Standard requires 8 hours of annual refresher training for hazardous waste workers.

#### **The objectives of the hazardous waste worker training program are to —**

- **Inform workers about potential hazards at their worksites;**
- **Provide workers with the knowledge and skills needed to perform work safely;**
- **Train workers on the uses and limitations of safety equipment; and**
- **Train workers to respond appropriately to emergencies.**

Because training requirements are competency based, 24- or 40-hour training represents a minimum requirement. Workers are to acquire all skills required to perform assigned duties competently and safely. Workers trained in the hazards of one process or one waste stream are not necessarily competent to work safely with another process or at another hazardous waste site.

## **Hazardous Waste Site Supervisors**

Onsite supervisors or team leaders of employees engaged in hazardous waste site remediation work are required to attend worker training and to receive an additional 8 hours of the appropriate level of specialized supervisory training, as stipulated in the HAZWOPER Standard.

## **Radiological Control Training**

Workers engaged in hazardous waste activities that pose the possibility for radiological exposure are required to complete radiological worker training, the level of training being commensurate with each worker's assignment and the hazards of a zone the worker is expected to enter. Workers engaged in hazardous waste activities with radiological or mixed wastes are required to complete the 40-hour HAZWOPER course and Radiation Safety training as specified in 10 CFR 835. Radiological Worker I or II training should be completed by these workers as recommended in the *Draft DOE Radiological Control Technical Standard* and the 10 CFR 835 Implementation Guides.

## **Emergency Response Training**

As specified in 29 CFR 1910.120(q), five different levels of competency are recognized for emergency responders. The content of training programs is based on the roles and responsibilities of the particular emergency responder as defined in the worksite emergency response plan (ERP).

## **Pre-Entry/Pre-Job Briefings**

The HASP includes pre-entry briefings to apprise employees of any site-specific hazards before any site activity begins. The purpose is to provide workers with important health and safety information concerning unique site hazards and activities. This training may include review of SOPs, site controls, emergency response procedures, and health hazards of specific site contaminants.

The *Draft DOE Radiological Control Technical Standard* recommends a pre-job briefing similar to that required by the HAZWOPER Standard; supervisors of radioactive hazardous waste activities should conduct pre-entry or pre-job briefings that will meet the requirements of 10 CFR 835, Subpart J, and the HAZWOPER Standard and that follow the recommendations of the *Draft DOE Radiological Control Technical Standard*. Pre-entry or pre-job briefings should be detailed enough to be pertinent to the tasks or activities being conducted. The briefings need to be repeated for new workers or when activities or worksite conditions change. The information presented at these briefings should be documented and an attendance list kept.

## **Site Visitors**

Site visitors include senior-level managers, inspectors or auditors, reporters, public officials, technical professionals, and other interested parties. Distinctions should be made between visitors who will enter an exclusion zone, contamination reduction zone (see page 25), or radiologically controlled area and those who will not. Visitors who will not enter these areas need not complete the required HAZWOPER training; however, they should be briefed on worksite hazards and on those aspects of the HASP that are pertinent to their visit. Visitors should be aware of access requirements and limitations, and they must understand emergency evacuation actions.

Visitors to DOE hazardous waste sites should be escorted by appropriately trained personnel. Visitors who will enter an exclusion zone or contamination reduction zone are to receive either 24- or 40-hour HAZWOPER training, depending on the activities they will be engaged in and the possibility of chemical exposure, and they are to complete the required level of supervised field experience and other appropriate OSHA or radiation safety training.

## **Reciprocity**

Reciprocity is one organization's acceptance of course work completed for another organization as having satisfied its training requirements. For the purposes of this guide, reciprocity relates to the 40- and 24-hour core and the 8-hour refresher courses which are required under 29 CFR 1910.120(e) or (p).

## **Equivalency**

Equivalency is the determination that previous experience, education, or training is equivalent to a given training course. Each employer should develop an equivalency process which ensures that workers have the necessary knowledge, skills, abilities, and competencies to complete their assigned tasks.

**At Oak Ridge, Martin Marietta Energy Systems (MMES) and the International Union of Operating Engineers (IUOE) jointly reviewed previously documented training of MMES employees. The learning objectives of the previous training were compared to the learning objectives of the IUOE 40-hour HAZWOPER course. The MMES and IUOE review concluded that the training equaled 16 hours of the IUOE 40-hour course. An additional 24 hours of HAZWOPER training was given to the MMES employees and they were given a 40-hour certificate. This is an appropriate equivalency methodology, and under the reciprocity process the 40-hour certificate is acceptable across the DOE complex.**

# HAZARDOUS WASTE ACTIVITIES AND OPERATIONS

Hazardous waste activities and operations include characterization and assessment of site conditions, establishment of access and hazard controls, implementation of hazard control measures, and decontamination activities.

## Hazard Characterization and Exposure Assessment

After the HASP is approved, trained personnel may enter the worksite. The objectives of an initial entry are to identify and characterize existing and potential hazards and to specify appropriate hazard control measures (e.g., engineering controls, administrative controls, PPE) for use at the worksite.

### **Activities during initial site entry include —**

- **Conducting a visual survey of the site;**
- **Monitoring for toxics and radiation;**
- **Sampling air, water, and soil; and**
- **Establishing site controls.**

After risks and hazards at a worksite are identified and characterized, work zones can be established and the development of a detailed site control program can begin.

## Access and Hazard Controls

An access and hazard control program is to be developed as part of each employer's health and safety program. Although the HAZWOPER Standard offers considerable latitude for employers to determine appropriate access and hazard control procedures, the



program includes the goals below and is to be modified as necessary when new information becomes available.

The three goals of every access and hazard control program are (1) to minimize or eliminate worker and public exposure to hazards, (2) to facilitate work activities, and (3) to prevent the spread of contamination. The degree of control depends on individual worksite characteristics and size, actual and potential hazards, adjacent activities, and the surrounding community.

Work zones are established to prevent the inadvertent spread of hazardous substances from contaminated to clean areas. Work zones also identify the level of hazard potential, thereby enabling workers to be properly equipped and protected before entry. Generally, hazardous waste sites are divided into three types of zones for remediation activities as discussed below and depicted in Figure 6.

A **support zone** is an uncontaminated area supporting hazardous waste activities. This area may include the command post, medical station, equipment and supply centers, administrative offices, and field laboratories.

A **contamination reduction zone** is a buffer between the hazardous waste work area and the support zone within which decontamination of personnel and equipment occurs. The **contamination reduction corridor** is an identified path for travel through the contamination reduction zone. Access control points limit entry into and exit from all work zones.

The **exclusion zone** is the area of contamination that represents the greatest possibility for exposure to worksite hazards. The outer boundary of this zone is referred to as the "Hot Line." Hazard characterization, monitoring, and cleanup activities occur within the exclusion zone. Activities within the exclusion zone must be thoroughly planned and documented in the comprehensive work plan.

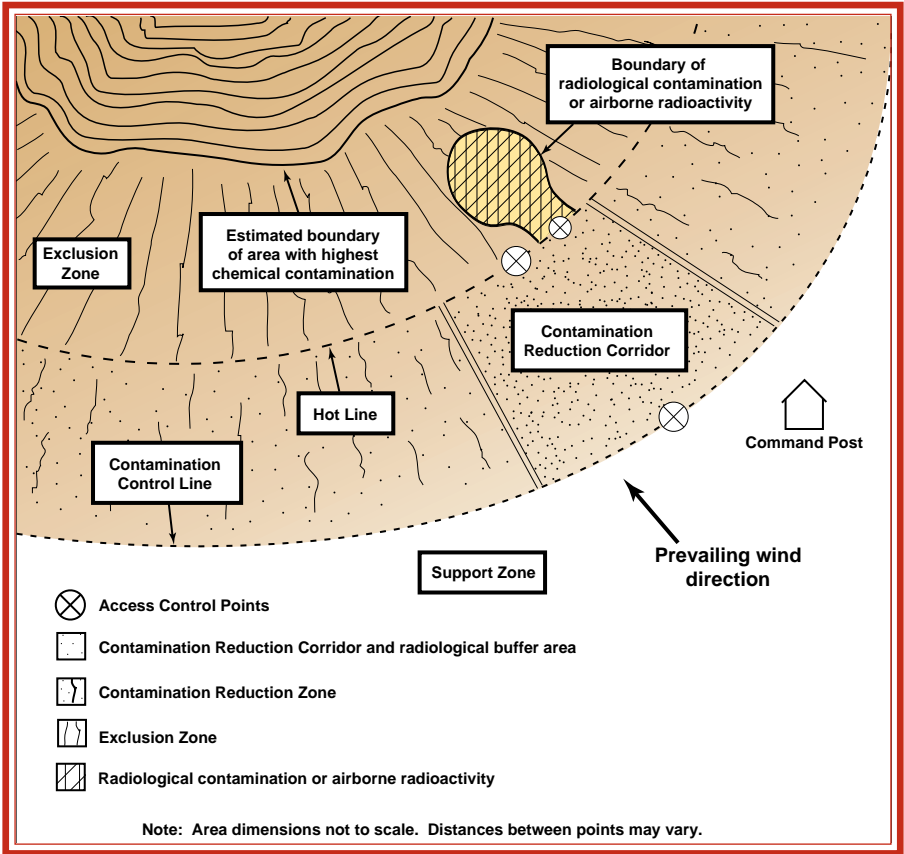


Figure 6. Site Work Zones.

The HAZWOPER Standard and 10 CFR 835 both address the concept of work zones. Subpart F of 10 CFR 835 requires an entry control program with elements consistent with those of the HAZWOPER access and hazard control program. As specified in 10 CFR 835, personnel entry controls are to be maintained for each radiological area; the degree of control must be commensurate with existing and potential radiological hazards within the area.

10 CFR 835 is prescriptive in the types of work zones necessary to control radiological hazards and the 10 CFR 835 Implementation Guides and *Draft DOE Radiological Control Technical Standard*

provide guidance for their establishment; however, radiological work zones closely parallel and are compatible with hazardous waste zones (see Table 1). For instance, radiological buffer areas and contamination reduction zones are equivalent, as are radiologically controlled areas and exclusion zones.

Table 1. HAZWOPER and Radiological Work Zones

HAZWOPER TERM	RADIOLOGICAL TERM
Contamination Control Line	Controlled Area Boundary
Exclusion Zone	Radiologically Controlled Area
Nonradiological (Chemical) Hazard Areas Within Exclusion Zone	Contamination Area or Radiation Area
Contamination Reduction Zone	Radiological Buffer Area

Hazard controls are used to reduce the possibility for worker exposure to health and safety hazards and to prevent property damage. The hazard control strategy for each worksite is specified in the HASP, with hazard control measures being divided into three general categories:

- Engineering controls;
- Administrative controls; and
- Use of PPE.

Control measures should be applied in a hierarchical manner, with engineering controls being preferred. Implementation of administrative controls can limit the applicability of the HAZWOPER Standard and control worker access to hazards. Although PPE is widely used and is generally effective, it is the least preferred of the hazard control measures. Figure 7 depicts

the hazard control hierarchy. A successful hazard control strategy includes an analysis of the following:

- The source or identification of all site-specific hazards (e.g., radiological, physical, chemical, or biological hazards; heavy equipment in use; ignition sources; confined spaces; oxygen deficiency; products or materials used);
- A history of accidents and exposure incidents at the worksite;
- Likely routes of exposure (typically obtained from material safety data sheets for hazardous substances brought onsite or for characterized worksite chemicals); and
- Options for controlling potentially hazardous exposures or conditions.

Engineering controls physically eliminate hazards or protect personnel through use of techniques such as isolation, chemical substitution, process design modifications, barrier designs, robotics, reengineering, ventilation, or interlocks. When engineering controls at a given site are not feasible or do not reduce and maintain exposures below the specified action levels (or radiation limits), administrative controls (e.g., written operating procedures, safe work plans, SWPs, and RWPs) are to be applied. Administrative controls establish procedures that limit the potential for worker exposure through such measures as restricted access and limitations on time of stay.

PPE is acceptable as a control measure (1) when engineering or administrative controls are not feasible or do not totally eliminate the hazard, (2) as an interim protective measure while engineering controls are being developed, or (3) during emergencies. The HAZWOPER Standard requires the employer to develop a written program that covers all aspects of PPE selection and use—from donning and doffing practices to maintenance, testing, and storage

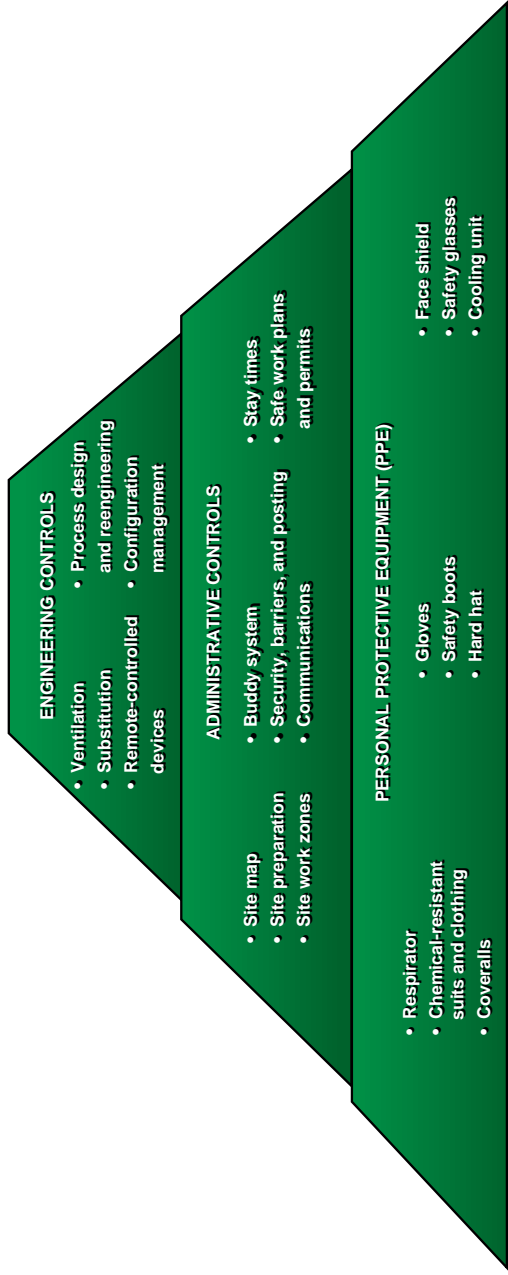


Figure 7. Hazard Control Hierarchy.

procedures. DOE Orders, OSHA regulations, and the *Draft DOE Radiological Control Technical Standard* stipulate mutually compatible requirements for PPE; all require a hazard control strategy that identifies the PPE necessary for each task. Integration of these requirements is particularly important at DOE sites where mixed wastes and a combination of hazards can be expected.

## **Worker and Equipment Decontamination**

Decontamination is the process used to remove or neutralize radiological, physical, chemical, or biological contaminants from personnel and equipment. An overall contamination control and decontamination approach is to be included in the HASP, communicated to site workers, and implemented before workers enter areas where the possibility exists for exposure to radiological, physical, chemical, or biological hazards. The decontamination strategy should consider a number of factors, including configuration of the decontamination facility, emergency decontamination procedures, a contamination prevention program, detection of contamination, identification of decontamination hazards, protection of decontamination workers, and evaluation of decontamination methods.

Proper donning and doffing of PPE, use of work zones, and decontamination efforts minimize cross-contamination from protective clothing to the worker, from a worker to other personnel, from equipment to personnel and the environment, and from contaminated areas to clean areas. Worksite-specific contamination control procedures are developed after specific hazards and job tasks at the worksite are evaluated.

## MEDICAL SURVEILLANCE AND EXPOSURE MONITORING

Before work begins, managers are to plan for and provide medical services for hazardous waste workers under their supervision. In addition, managers at worksites with hazardous waste activities are required to implement systems to assess, monitor, and maintain records concerning employee health. Communication between the sites' medical organization, industrial hygiene, radiation control, and the worker is critical.

### **Medical surveillance and monitoring programs are designed to accomplish the following —**

- **Demonstrate that workers are fit to perform their jobs safely and reliably (see Table 2);**
- **Provide ongoing assurance that access and hazard controls limit worker exposure; and**
- **Comply with DOE rules and requirements and OSHA regulations adopted by DOE.**

Health and safety professionals need to determine what monitoring strategy will work best at a given site. Monitoring should be conducted whenever there is an indication that exposures may rise above the DOE-adopted OSHA action levels (or DOE radiation levels) or when other potentially dangerous conditions exist (e.g., flammable atmospheres, oxygen-deficient environments). Employees with the highest potential risk of exposure to hazardous substances and other health hazards should be monitored accordingly. In addition, the perimeter of each site should be monitored to make certain that the public is not being exposed to hazardous substances.

Air-monitoring data should be used to determine the proper respiratory protection for workers, and the level of protection should be adjusted to reflect monitoring results. Radiological and chemical monitoring activities should be integrated into a single monitoring program.

Table 2. Required Medical Examinations for Hazardous Waste Activities Workers

<b>TYPE OF EXAMINATION</b>	<b>WHEN CONDUCTED</b>
Baseline	Before commencing duties at worksite.
Periodic	At least annually or biannually, as determined by the attending physician.
Symptomatic or emergency	When exposure-related injury or illness occurs; or when exposure-related symptoms are observed.
Professional recommendation	Based on necessity, as determined by an occupational health professional.
Termination	At termination of employment; or on reassignment to an area where medical surveillance is not required.



## EMERGENCY PREPAREDNESS AND RESPONSE

The DOE emergency management requirements were developed to address both public and worker protection in emergencies and establishes a system which is consistent from the facility up through the national level. While DOE Orders and the HAZWOPER Standard cover similar emergency preparedness concepts and execution, HAZWOPER is more prescriptive, owing to its exclusive focus on worker protection, than are the DOE Orders. In order to facilitate integration of the Orders and the HAZWOPER Standard, DOE has developed supplemental guidance explaining how the HAZWOPER emergency response requirements can be integrated into the DOE emergency preparedness and response system.

The *DOE Emergency Management Guide* (EMG) provides guidance for integrating and implementing emergency management requirements for DOE operations and activities. An Appendix to the EMG, *Draft Emergency Management Guide for HAZWOPER Emergency Response Requirements*, was developed to provide clarification for consistent integration of the OSHA requirements. The HAZWOPER appendix to the EMG specifically addresses implementation requirements of the HAZWOPER Standard that are **not** covered by the DOE Orders.

There are five emergency response program areas for which HAZWOPER provides **more detailed guidance** than DOE Orders or the EMG; these include documents, emergency response organization, emergency equipment and PPE, training, and medical surveillance.

### Documents

Because there is considerable overlap between the HAZWOPER and the DOE 5500 series of Orders concerning required emergency plan documentation and planning elements, many of the HAZWOPER components are already an integral part of a DOE site's emergency management system.

*Emergency Action Plans.* An emergency action plan (EAP) is essentially an evacuation plan. DOE sites that intend to evacuate their employees from the danger area, when a release requiring emergency response occurs, are only required by OSHA to have an EAP with the elements specified by 29 CFR 1910.38(a) as shown below —

### **Emergency Action Plan Elements —**

- **Emergency escape procedures and emergency escape route assignments;**
- **Procedures to be followed by employees remaining to operate critical plant operations before they evacuate;**
- **Procedures to account for all employees after evacuation is completed;**
- **Rescue and medical duties for employees;**
- **Preferred means of reporting fires and other emergencies;**
- **Names of contacts for additional information or explanation of duties under the plan; and**
- **Pre-incident planning, coordination, and notification procedures with outside parties as required by 29 CFR 1910.120.**

*Emergency Response Plans.* An Emergency Response Plan (ERP) is a written plan to prepare for and handle anticipated emergencies prior to commencement of hazardous waste operations or emergency response operations. If DOE facility

employees are expected to respond to spills or releases that require an emergency response, OSHA requires the development of an ERP containing the following elements —

### **Emergency Response Plan Elements**

- **Pre-incident planning and coordination with outside parties;**
- **Pre-emergency planning prior to operation;**
- **Personnel roles, lines of authority, training, and communication;**
- **Emergency recognition, identification, and prevention;**
- **Safe distances and places of refuge;**
- **Site security and control;**
- **Evacuation routes and procedures;**
- **Decontamination;**
- **Emergency medical treatment and first aid;**
- **Emergency alerting and response procedures;**
- **Critique of response and followup; and**
- **PPE and emergency equipment.**

## Emergency Response Organization

Procedures for handling emergency response, incident command protocols, and safety practices at the scene of a hazardous material emergency are addressed in 29 CFR 1910.120(q)(3). The following emergency response organizational issues **are not specified** in DOE Orders:

- Coordination and control of emergency responder communications;
- Specific responsibilities with regard to use of engineering controls, hazardous substance handling procedures, and use of new technologies;
- Self-contained breathing apparatus (SCBA) use requirements;
- On-scene response, safety practice requirements, and safety official responsibilities;
- Incident commander role, such as implementing decontamination procedures;
- On-scene safety requirements for pre-briefings for personnel, instructions for wearing PPE and for response duties, and health and safety precautions for skilled support personnel; and
- Common terms.

Employers are to identify all potential emergencies, using worst-case assumptions, and plan response procedures accordingly. A summary of the most recent interpretive guidance published by OSHA concerning the types of incidents that require an emergency response is given below.

## **Circumstances That Require an Emergency Response**

- **When the release prompts a response from outside the immediate release area;**
- **When employees must evacuate the area;**
- **When the release requires immediate attention because of imminent danger;**
- **When the release leads to a condition that is immediately dangerous to life or health;**
- **When the release poses a fire or explosion hazard;**
- **When the release may cause exposure to high levels of hazardous or radioactive substances;**
- **When the release may be life threatening or injury provoking;**
- **When it is uncertain whether or not the release has caused the exposure limit to be exceeded; and**
- **When the situation is unclear, or important data are lacking.**

## **Emergency Equipment and Personal Protective Equipment**

HAZWOPER requirements for PPE are more specific than requirements in DOE Orders; however, no conflict exists between

DOE and OSHA requirements. Areas of guidance in the HAZWOPER Standard **not specified in DOE Orders** include:

- *SCBA Use In Emergency Response.* A positive-pressure SCBA is to be used while personnel are engaged in emergency response, until such time as the individual in charge of the Incident Command System determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposure to employees.
- *Approved Cylinders.* Approved SCBAs may be used with approved cylinders from other approved SCBAs, provided the cylinders are of the same capacity and pressure rating.
- *Chemical Protective Clothing and Equipment.* Based on characterization of the emergency site, the incident commander is responsible for implementing appropriate emergency response operations and making certain that appropriate PPE is used, recognizing that turnout gear is not appropriate for chemical exposure emergencies.

## **Training**

HAZWOPER training requirements for emergency responders **are more specific** than DOE requirements in the areas of —

- Annual employer certification of competency;
- Training content;
- The number of hours of training required; and
- Incident command training.

There are several different levels of training specified in 29 CFR 1910.120(q) and National Fire Protection Association (NFPA) Standard 473 for HAZMAT emergency response personnel. Each level is based on the competencies needed for that particular level of response and the health and safety hazards each level is expected to encounter. Employers are to certify competency of their employees who are trained for the first responder operations level, as HAZMAT technicians, as emergency medical support personnel, and as incident commanders.

## **Medical Surveillance**

In the medical surveillance area, there is no conflict between the HAZWOPER Standard and DOE Orders; however, HAZWOPER presents more specific requirements with regard to medical surveillance of emergency response team members and provision by the physician of a written medical report to the individual.

Additional areas of guidance **not specified in** DOE Orders include —

- *Medical Surveillance of and Consultation for Emergency Responders.* Members of HAZMAT teams as well as HAZMAT technicians are to receive a baseline physical examination to certify their physical ability to perform their assigned duties, including the ability to work within the confines of PPE. They should also be provided with medical surveillance annually and after any hazardous substance exposure. The employer must furnish the employee with a copy of the physician's written opinion indicating medical results and whether the employee is capable of working with hazardous substances.

Any emergency response employee who exhibits signs or symptoms that may have resulted from exposure to hazardous substances during an emergency incident is to receive medical consultation. The responder's employer is to provide to the physician a description of the employee's duties as they relate to the individual's exposure, the responder's exposure level, a description of any PPE used, and information from previous medical examinations of the employee that is not readily available to the examining physician.

- *Emergency Medical Treatment, Transport, and First Aid.* Site emergency response organizations should develop and maintain a Memorandum of Agreement or Memorandum of Understanding with local medical centers for treatment beyond site capability for injured, contaminated, or irradiated personnel. Facilities are expected to coordinate with hospitals or other medical care providers prior to emergencies in case victims need emergency transportation or decontamination services.

For additional information, tools, and guidance on the development and cost-effective implementation of the topics discussed in this guide, refer to the *Handbook for Occupational Health and Safety During DOE Hazardous Waste Activities*.