

U.S. Department of Energy



**Handbook**  
**for**  
**Occupational Health and Safety**  
**During**  
**Hazardous Waste Activities**

**Office of Environment, Safety and Health**  
**Office of Environmental Management**

**JUNE 1996**

# EXECUTIVE SUMMARY

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This Handbook provides tools and guidance to establish and implement comprehensive, cost-effective, hazard-based worker health and safety programs that are an integral part of accomplishing work on time and within budget. This Handbook has been developed to assist Department of Energy (DOE) and contractor organizations in the integration and implementation of DOE rules and requirements and DOE-adopted Occupational Safety and Health Administration (OSHA) requirements. It is designed to incorporate lessons learned from field visits and provide descriptions of alternative approaches and options on how to implement a worker protection program effectively. During the development of the Handbook, input and comments were solicited from DOE field offices and contractors, labor representatives, and organizations outside the DOE complex through a series of meetings, field visits, and workshops.

The information in this Handbook provides project managers and health and safety professionals with the following benefits:

- A decision model for determining the applicability of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response" (the HAZWOPER Standard), to the broad spectrum of DOE hazardous waste activities;
- A systematic process for integrating the elements of the HAZWOPER Standard with other OSHA, DOE, and DOE-adopted nuclear and nonnuclear rules and requirements to maximize both worker protection and compliance in performing hazardous waste activities;
- A framework that enables a cost-effective and hazard-based approach to be applied to the safe conduct and control of hazardous waste activities;
- A multidisciplinary, team-based process to plan, evaluate, and conduct hazardous waste activities; and
- Field-tested, practical methods for controlling the worksite, controlling hazards, and preventing contamination while getting the work done.

Figure ES-1 outlines the major topics in the Handbook and their relationship to one another; a chapter is devoted to each topic on the figure. The Handbook provides a roadmap and useful tools for the project manager, from the process of planning and preparing work, to conducting work safely, to decontaminating personnel and equipment.

**BACKGROUND:** In cooperation with DOE field operations, the Offices of Environment, Safety and Health (EH) and Environmental Management (EM) have established a strategic partnership to define, develop, and implement occupational safety and health guidance to enhance worker protection and promote DOE hazardous waste-related activities.

**SCOPE, APPLICATION, AND INTEGRATION:** Hazardous waste operations and activities are evaluated to determine whether they fall under the HAZWOPER Standard—depending on whether the worksites are regulated and whether there is a possibility for worker exposure to health and safety hazards from the operations. Determining regulatory requirements is essential to planning work, establishing budgets, and identifying schedule requirements to conduct activities safely.

After it is determined whether a hazardous waste operation falls under the scope of HAZWOPER, a hazard-based approach to the implementation of the various elements (paragraphs) of the Standard must be developed. When the HAZWOPER Standard is implemented, OSHA stipulates that if there is overlap or conflict with another standard, the provision more protective of worker health and safety applies.

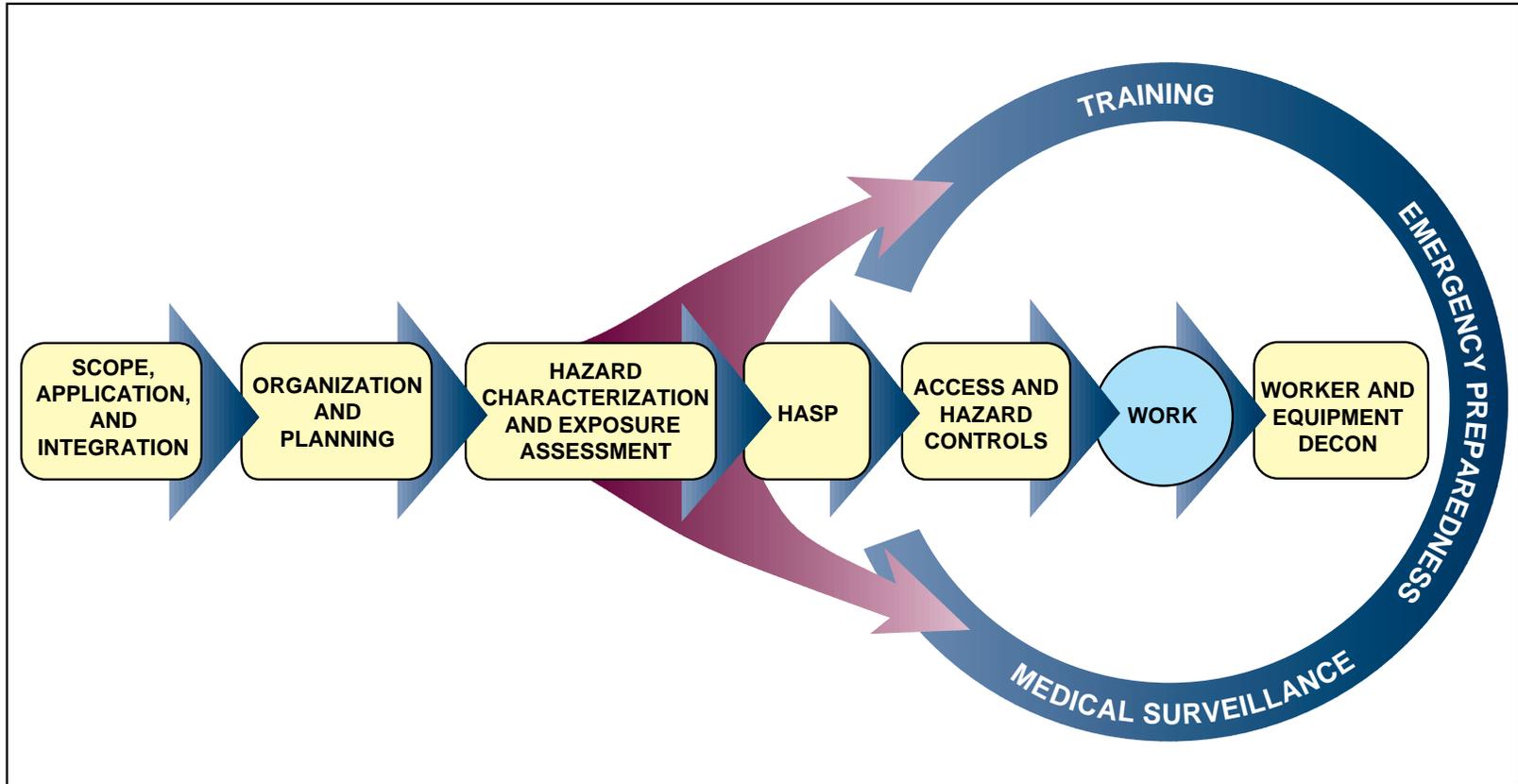


Figure ES-1. Organization of the Handbook

Chapter 2 provides the tools and steps necessary for the project manager and the multidisciplinary team to evaluate the scope and applicability of the HAZWOPER Standard and to integrate HAZWOPER with existing DOE rules and requirements using a risk- and hazard-based approach. It also provides guidance for activities that normally fall outside the scope, such as deactivation and decommissioning, but for which DOE has adopted an approach which uses the concepts and principles of HAZWOPER as a framework.

**ORGANIZATION AND PLANNING:** Establishing an effective multidisciplinary project team for hazardous waste activities promotes comprehensive work planning to avoid unsafe operations and work stoppages. The project team is composed of line managers and supervisors, health and safety professionals, site worker representatives, and engineers and other field personnel. Project teams encourage the incorporation of health and safety principles into the day-to-day jobs and tasks of all workers, which allows work to be done safely, on time, and within budget.

Although the details of planning for hazardous waste activities are as varied and unique as the operations themselves, Chapter 3 identifies certain concepts related to worker protection that are common to all projects:

- Identification of applicable regulations, Orders, and guidelines as documented through the standards/requirements identification documents (S/RIDs) or the necessary and sufficient process;
- Determination of integrated strategies for developing and implementing plans and procedures;
- Consideration of environmental, safety, and health concerns;
- Characterization of hazards at each worksite to determine hazard categories, types, and potentials and to develop a hazard-based compliance strategy;
- Development of a work plan, a site-specific health and safety plan (HASP) (including job hazard analyses), and work controls that focus on tasks and hazards identified in the work plan;
- Identification and organization of required resources, including personnel, equipment, funding, and facilities; and
- Implementation of daily planning and work control processes.

**TRAINING:** Training is the heart of any HAZWOPER program. It enables the workers to recognize health and safety hazards, and to prevent accidents and injuries. As a result, training increases productivity and can improve worker morale. However, training requirements can represent more than 50 percent of the cost of HAZWOPER implementation at some DOE sites. A comprehensive, integrated health and safety training program is key to providing a cost-effective means of meeting those requirements; DOE recommends the use of a "systematic approach to training," where the content and rigor of training are commensurate with the potential hazards, exposures, and work requirements.

Chapter 4 provides the project manager with guidance for implementing the training requirements in the HAZWOPER Standard as well as for integrating the requirements of other pertinent OSHA Standards and DOE rules and requirements. It also provides proposals to address two issues: course reciprocity (an organization's acceptance of course work completed at another organization); and equivalency (determining what previous experience, education, or training, or all three, will meet the requirements of a given course).

**HAZARD CHARACTERIZATION AND EXPOSURE ASSESSMENT:** Hazard characterization and exposure assessment are the key to determining the breadth of the health and safety program and associated cost and impact. Hazard characterization and exposure assessment provide the information needed by the project manager to identify and plan how to control worksite hazards and minimize HAZWOPER applicability. Hazard characterization and exposure assessment involve the identification of the location, magnitude, and nature of any radiological or hazardous agents, safety hazards, and exposures at the worksite.

Chapter 5 discusses the regulatory framework and analytical tools to make this assessment including job safety analysis and job hazard analysis; safety analysis reports; process hazard analysis; and job, task, and hazard analysis. This chapter also provides a hazard characterization and exposure assessment strategy to assist the project manager in the successful conduct of these activities.

**DEVELOPMENT OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN:** A HASP is required before work begins and integrates the existing site health and safety program with the HAZWOPER worksite-specific worker protection requirements. The HASP delineates health and safety hazards, controls, and requirements for individual activities. In addition to guidelines for preparing a HASP, Chapter 6 provides an example of a HASP. This chapter also offers two approaches for developing a HASP for a worksite containing both radiological and nonradiological hazards.

It is important to remember that the provisions of an approved and signed HASP are part of the authorization basis and are enforceable as an extension of the HAZWOPER Standard.

**ACCESS AND HAZARD CONTROLS:** Controlling worker access to hazards limits the applicability of the HAZWOPER Standard and the scope of required worker protection programs. Protection of worker health and safety during DOE hazardous waste activities is accomplished through the application of a hierarchy of access and hazard control methods. The first option to consider in implementing control of worker access to hazards is the use of engineering controls to remove or isolate the hazard. The next option is the use of administrative controls, and finally, personal protective equipment (PPE) can be used as a supplement to the two preferred methods.

Chapter 7 provides tools and guidance for the selection and implementation of engineering, administrative, and PPE controls, and demonstrates how to integrate radiological and nonradiological hazard controls, pointing out that site control concepts specified in 29 CFR 1910.120, 10 CFR 835, and the *Draft DOE Radiological Control Technical Standard* are compatible and consistent, differing only in nomenclature.

**WORKER AND EQUIPMENT DECONTAMINATION:** Efficient worker and equipment decontamination programs are critical to expedite worker egress, minimize the generation of costly hazardous waste, and minimize equipment replacement. Before work can begin, contamination control and decontamination programs for workers and equipment are documented in the HASP; communicated to site workers; and implemented in areas where there is a possibility for exposure to chemical, biological, or radiological hazards. Chapter 8 discusses the overall decontamination strategy, including decontamination methods, and provides guidance for integrating nuclear and nonnuclear requirements into the decontamination process.

**MEDICAL SURVEILLANCE PROGRAMS:** Managers at worksites with hazardous waste activities are required to implement systems to assess, monitor, and maintain records concerning employee health in order to minimize adverse health effects on the workforce. Chapter 9 outlines the medical examinations required for hazardous waste activities workers and provides an example of how to document physical requirements, working conditions, required protective equipment, and special qualifications for all positions.

**EMERGENCY PREPAREDNESS AND RESPONSE:** Emergency preparedness must be established for the protection of the workforce and public before work can begin or be allowed to continue. Requirements for emergency management programs at DOE facilities are detailed in the DOE 5500 series of Orders, particularly in DOE 5500.3A, "Planning and Preparedness for Operational Emergencies" for existing contracts. These Orders have been superseded by DOE O 151.1, "Comprehensive Emergency Management System," and the supplemental information provided in the Office of Nonproliferation and National Security's (NN) *Emergency Management Guide* for new contracts. While the HAZWOPER Standard and the DOE 5500 series of Orders are complementary, differences do exist. DOE focuses on a management system for emergency planning and response, whereas OSHA focuses on worker and responder safety. Chapter 10 discusses these differences and offers guidance on integrating the requirements; it also provides an introduction to the DOE *Emergency Management Guide*.

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