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MANAGING THE DEPARTMENT OF ENERGY'S HAZARDOUS AND MIXED DEFENSE WASTES

by

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INTRODUCTION

The Department of Energy (DOE) has overall responsibility for the production of nuclear weapons and nuclear materials, and the Assistant Secretary for Defense Programs (ASDP) is the cognizant Departmental official for the weapons programs. The mission of the Office of the ASDP is to provide and maintain a nuclear weapons complex with sufficient capacity and capability to assure a prudent level of flexibility in national security options. To fulfill its mission, Defense Programs (DP) operates 16 production, processing, testing, and research and development (R&D) installations in 13 states.

The production of nuclear weapons is a large-scale industry, and like other industries, it generates wastes. Defense activities result in wastes that are either radioactive or chemically hazardous or both. Many of the waste streams, (e.g., halogenated solvents contaminated with uranium) are not common in private industry and require special handling and procedures to protect public health and the environment.

In addition, national security requires that DOE maintain strict safeguards on defense-related materials and information. These security needs dictate that the Department maintain a coordinated and uniform program despite considerable variation in waste management regulations from location to location. This paper will provide an overview of DOE's defense waste management and will describe the program that has been developed for managing hazardous and mixed wastes.

DEPARTMENTAL RESPONSIBILITIES

The Office of Defense Waste and Transportation Management (DWTM), under the ASDP, develops and directs programs for assuring that defense wastes are safely handled, treated, stored, and utilized and are transported and disposed of in a manner that protects public health and safety and the environment. The four divisions under DWTM divide the responsibilities for the various aspects of defense waste management as follows:

- o Operations and Projects Division - This office is responsible for the management of radioactive waste at the DP sites and construction of related projects.
- o Waste R&D Division - This office manages the national technology development program to support the operational requirements of defense waste management.
- o Transportation Management Division - This division directs transportation R&D, transportation operations and traffic management, and packaging operations management activities.

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- o Hazardous Waste and Remedial Actions Division - This division supports the implementation of DP's responses to the legislative and regulatory requirements covering treatment, storage, and disposal (T/S/D) of hazardous wastes, and the restoration of inactive sites containing hazardous materials. In addition, management of the program for decontamination and decommissioning of surplus DP facilities is the responsibility of this division. Thus, DP activities that respond to the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are of interest to this division.

The Offices of the Deputy Assistant Secretaries for Nuclear Materials and Military Application are responsible to the ASDP for implementation of materials and weapons production programs including assuring that the Operations Offices that report to these Programs comply with the appropriate environmental laws, regulations, and directives. Thus, the Program Offices, in their programmatic interactions with the field offices, have the DOE Headquarters' responsibility for implementing Department-wide policies and plans.

The responsibilities of the Operations Offices, in turn, include identifying the waste management needs of the DP sites they manage and preparing and submitting remedial action project proposals and budgets to the Program Offices. They manage the field tasks and projects designed to achieve and maintain environmental compliance at the DP sites and oversee the day-to-day operations of their site contractors, who execute the necessary waste management activities in the field.

Finally, the Office of the Assistant Secretary for Environment, Safety and Health (ASEH) is responsible for overall Departmental efforts to ensure compliance with all applicable environmental, health and safety statutes and regulations and prudent environmental management at all DOE sites. The DP organizations, therefore, coordinate their defense waste management work with the ASEH so that specific waste-handling activities at the DP sites reflect overall Departmental policy on environmental compliance and management.

DOE INTERFACE WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA)

The authority to regulate source, special nuclear, and byproduct materials is given to DOE by the Atomic Energy Act (AEA) of 1954. Although source, special nuclear, and byproduct materials are specifically excluded from RCRA's definition of hazardous waste, DOE does comply with RCRA for hazardous and mixed wastes not covered by the AEA. The DP facilities have submitted RCRA Part B applications; have begun submitting the first of the required biannual inventories of hazardous waste T/S/D/ sites; and are complying with other RCRA requirements on waste minimization, groundwater monitoring, and underground storage tanks. The EPA is working with DOE to ensure that any special handling requirements for our unique defense waste materials are considered in applying RCRA to the DOE facilities. In addition, EPA has developed provisions for handling information about DOE wastes where national security interests require prevention of disclosure. The DOE policy on hazardous and radioactive mixed waste management is set forth in DOE Order 5480.2.

The DOE policy regarding inactive hazardous waste disposal sites at its facilities is to identify and evaluate potential problems with such sites, to control the migration of hazardous materials from them, and to minimize potential hazards that could result from past waste-handling operations. The DOE CERCLA program was formalized with the publication of DOE Order 5480.14 in May 1985. The program is designed to be consistent with EPA's CERCLA procedures, in so far as is possible, while still taking advantage of the various remedial program experience already gained in the federal sector (e.g., by the Department of Defense). The DOE procedures, shown in Table 1, parallel those of the National Oil and Hazardous Substances Contingency Plan (NCP).

Table 1. Comparison of EPA and DOE CERCLA procedures

NCP ^a (40 CFR 300)	DOE Order 5480.14
Site discovery/notification	
Preliminary assessment and site inspection	Phase I - Installation Assessment
Scoring priorities for remedial actions using Hazard Ranking System	
Remedial investigation	Phase II - Confirmation/Quantification
Feasibility study	Phase III - Engineering Assessment
Remedial action design and construction	Phase IV - Remedial Action
	Phase V - Compliance and Verification

^aNCP = National Oil and Hazardous Substances Contingency Plan.

Table 2 gives the target completion dates for the five DOE CERCLA program phases. Although the precise nature of the requirements for federal facilities that are likely to be part of the reauthorized CERCLA was not known at the time this paper was written, the DOE field organizations were well on their way to completing Phase I Installation Assessments, which were due in May of this year.

Table 2. Target dates for completing DOE CERCLA phases

DOE-CERCLA Phase	Activity	Target date
I	Installation Assessment	May 1986
II	Confirmation	May 1987
III	Engineering Assessment	May 1989
IV	Remedial Actions	May 1993
V	Compliance and Verification	May 1995

It should be noted that at any given DP facility, activities in several phases may be underway concurrently at different project sites within the facility. Completion of the DOE CERCLA program will be a continuous process, and work in each phase will be conducted at a project site as soon as is practical. Also note that many sites are designated for remedial action under other programs such as the Formerly Used Sites Remedial Action Program, the Uranium Mill Tailings Remedial Action Project, and the Surplus Facilities Management Program. These have their own program documentation in lieu of that required by the DOE Order because the projects, charters, and plans of these programs meet the intent of CERCLA and Order 5480.14.

THE DP PROGRAM FOR MANAGEMENT OF HAZARDOUS WASTES

As has been stated, many different Departmental entities have responsibilities for, or are concerned with, various aspects of managing defense wastes. The diverse array of Program Offices, Operations Offices, and contractor-operated field sites implies that a single integrated program to assist all DP organizations with their hazardous waste management activities would be of great benefit. For this reason, the Hazardous Waste Remedial Actions Program (HAZWRAP) was established by the ASDP to provide DP with centralized planning and technical support for RCRA- and CERCLA-related activities.

The goal of the HAZWRAP is to support the implementation and improvement of hazardous chemical and mixed waste management such that (1) public health, safety, and the environment are protected; (2) DP facilities comply with all applicable federal and state statutes and regulations; and (3) adverse impacts on the DP mission are minimized. Overall, HAZWRAP is aimed at supporting the implementation of strategies that will reduce exposures to hazardous materials, reduce quantities of wastes generated, improve treatment capabilities, and improve disposal methods for wastes remaining after treatment. The HAZWRAP attempts to integrate all these strategies so as to reduce costs, avoid duplication of effort, and save time in responding to compliance requirements.

The program structure has three basic parts. The Hazardous Waste and Remedial Actions Division of DWTM is overall manager of the HAZWRAP. The Oak Ridge Operations Office (ORO) has been designated as lead Operations Office for support to DWTM for hazardous waste management. The HAZWRAP Office at ORO conducts its program in accordance with DWTM's policy and guidance. In addition, ORO has an emerging mission in making Oak Ridge a center of expertise and a national model for DOE waste management activities.

In support of ORO and its Program mission, Martin Marietta Energy Systems, the contractor that operates the three DOE facilities in Oak Ridge, has been given the role of Support Contractor Office (SCO) for HAZWRAP. The SCO portion of HAZWRAP is housed at the Oak Ridge National Laboratory. The SCO assists in identifying needed remedial actions, recommends priorities, proposes areas for technology development, tracks and reports Program progress, and provides improved communications and information transfer. A brief description of tasks currently being performed by ORO and the SCO is given below. More detailed discussion of the Program and some of its main elements can be found in companion papers in these Proceedings.

ON-GOING ACTIVITIES UNDER HAZWRAP

The HAZWRAP has four major elements.

- o Project Review and Prioritization - In this program component, HAZWRAP has been assessing methodologies for providing the ASDP with an annual independent review and ranking of all proposed RCRA- and CERCLA-related remedial action projects. The setting of technically based priorities for project funding is necessary because the construction budget is limited, and not all proposed projects can be funded in a single fiscal year. In addition, this program element also provides for technical support to the DP Program Offices and field organizations in identifying and correcting deficiencies in regulatory compliance.

- o Technology Adaptation - This portion of HAZWRAP currently funds 12 R&D hazardous waste management technology adaptation tasks. These tasks range from designing and testing incinerators, magnetic separators, and waste immobilization methods to refining risk assessment methodologies for evaluating waste facilities. In addition, DOE, EPA, and the Department of Defense are considering a cooperative effort that would facilitate large-scale demonstrations of the effectiveness of selective technologies for restoration activities at CERCLA-equivalent locations at federal installations. Technology adaptation efforts could be focused to support this demonstration program in the future.
- o Information System - This element provides specialized data bases on hazardous and mixed waste technology, all of which are available to users Department wide as the DOE Waste Information Network. (See paper by C. S. Fore in these Proceedings). The information system component also provides data analysis, document preparation and control services, and a computerized electronic communications system linking the DOE organizations.
- o Strategic Alternatives Study (SAS) - The objective of the SAS is to establish a set of alternatives for developing and implementing an integrated long-term, waste-management strategy for DP. Various concepts, such as waste minimization, system internalization, and centralized vs decentralized facility planning, are being examined to determine the optimal role that each might play in a DP-wide waste management system.

SUMMARY

Like other large and complex industries, the nuclear weapons programs produce hazardous chemical wastes, many of which require special handling for the protection of health, safety, and the environment. This requires the interaction of a multiplicity of organizational entities. The HAZWRAP was established to provide centralized planning and technical support for DP RCRA- and CERCLA-related activities. The benefits of a centralized program integrator include DP-wide consistency in regulatory compliance, effective setting and execution of priorities, and development of optimal long-term waste management strategies for the DP complex.

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