

CONF-881054--17

HAZWDDD - AN EXERCISE IN CORPORATE PLANNING

CONF-881054--17

DE89 001491

C. P. McGinnis
Chemical Technology Division

W. H. Pechin
Chemical Technology Division

Oak Ridge National Laboratory*
P. O. Box 2008
Oak Ridge, Tennessee 37831-6273

for

Publication

at

The DOE Model Conference

in

Oak Ridge, Tennessee

October 3-7, 1988

"The submitted manuscript has been authored by a contractor of the U.S. Government under contract No. DE-AC05-84OR21400. Accordingly, the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U.S. Government purposes."



DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

*Operated by Martin Marietta Energy Systems, Inc., for the U.S. Department of Energy, under contract DE-AC05-84OR21400.

8

HAZWDDD - AN EXERCISE IN CORPORATE PLANNING

C. P. McGinnis and W. H. Pechin

ABSTRACT

The Hazardous Waste Development, Demonstration, and Disposal (HAZWDDD) program is a corporate initiative that is coordinated between Martin Marietta Energy Systems, Inc. (Energy Systems), and the U.S. Department of Energy's Oak Ridge Operations Office (DOE-ORO). The major objective of HAZWDDD is to develop a comprehensive management strategy for the hazardous and mixed wastes generated by the five Energy Systems installations. This program is of prime importance because federal and state regulations for handling hazardous wastes are becoming increasingly stringent and the generator of such wastes retains legally mandated liability for their disposal indefinitely. For example, any waste generator who uses a disposal site that later fails containment will be liable, in full, for its remediation if other users are unable to cofund the cleanup. In addition, no acceptable method is currently available for handling mixed (hazardous and radioactive) wastes.

Both Energy Systems corporate management and DOE-ORO management have recognized the seriousness of these problems and have established several programs to determine acceptable courses of action. A plan has been developed for low-level radioactive waste (LLW),¹ and an active dialogue pertaining to LLW is maintained with the state and federal regulators. During 1986, DOE-ORO and Energy Systems identified the need for a plan to address hazardous and mixed wastes. Each installation supports the concept of HAZWDDD through funding and the development of individual HAZWDDD implementation plans. A corporate plan is being developed to integrate the issues discussed in the five installation plans.

This paper describes:

1. the approach taken in collecting the necessary information for the plan,
2. some of the techniques used in analyzing the information provided,
3. preliminary data that have been collected in preparation of this plan,
4. the identification of common concerns and issues, and
5. the integration of this information into a corporate approach to mixed and hazardous waste management.

¹ Strategic Planning for the Low-Level Waste Disposal Development and Demonstration (LLWDDD) Program, R. K. Genung, D. W. Lee, R. B. McLean, J. M. Kennerly, R. B. Clapp, A. L. Rivera, and S. D. Van Hoesen, Draft Report submitted to the Research and Waste Management Division, Oak Ridge Operations Office, U.S. Department of Energy, July 1987.

HAZWDDD has taken a "bottom up" approach in collecting data and in establishing immediate priorities. "Bottom up" refers to starting at the most detailed level and collecting data which are subsequently summed to obtain a general picture. The five installations met in planning sessions to determine the need for waste characterization and generating facilities data bases, and a consensus was reached concerning the important parameters to be surveyed. A corporate team then spent sufficient time at each installation to assist the local team in developing a comprehensive listing of their waste streams and facilities. The resulting data were reported in a uniform format and incorporated into a computerized data base which was reviewed by the local and corporate teams to ensure completeness and to uncover any anomalies. For immediate problems such as handling of inorganic sludges or PCB-contaminated soils, the corporate team simply served as a communication link between the installations and provided technical information on treatment of similar problems at other Energy System locations. This approach has been very effective in terms of disclosing and understanding local problems.

The corporate team has then followed with a "top down" approach when integrating the data to assist in future facility planning and in establishing long-term priorities. "Top down" refers to starting with general policies and principles and applying them to specific problems in order to arrive at acceptable solutions. Meetings were held with installation representatives and consultants to delineate and rank the significant waste problems facing Energy Systems. The corporate team was provided with both the resources and the time to develop a consensus plan to identify technology requirements, development studies, demonstration projects, and needed facilities for waste treatment and disposal. This approach will be used in a continuing effort to identify new problems and to assess priorities. Formal mechanisms have been established to ensure periodic updates.

Site Plans and Data Collection

The corporate team established a HAZWDDD Data Base project to integrate information across installation lines in a common format. The corporate data base team, in conjunction with the data base team at each installation, then arrived at a standardized format for planning and waste stream identification. This format greatly facilitated comparison and consolidation of information. Four hundred waste streams were identified from the five installations. Each stream was grouped by category of wastes, as identified in Table 1, to allow comparison by categories. Energy System treatment, storage, and disposal (TSD) facilities were also categorized by capabilities. These data allowed the corporate team to gather additional information from the installation teams on the major problems at individual sites for short-term prioritization. The information collected, organized, and analyzed in these three exercises allows a listing and prioritization of technological and facility needs.

Table 1. Categorization of hazardous wastes for HAZWDDD

Category	EPA code(s)	Description
<u>Characteristically hazardous wastes</u>		
A	D001	Ignitable - a waste exhibits this characteristic if the waste has a flash point below 60°C or, as a solid, is capable of causing fire through friction at standard temperature and pressure (see 40 CFR 261.21)
B	D002	Corrosive - a waste exhibits this characteristic if its pH is less than 2 or greater than 12.5, or if it corrodes steel at a given rate (see 40 CFR 261.22)
C	D003	Reactive - a waste exhibits reactivity if it is normally unstable, reacts violently with water, is capable of detonation, or generates toxic gases under certain conditions (see 40 CFR 261.23)
D	D004-D017	EP toxic - a waste exhibits toxicity if the leachate contains given toxic chemicals (such as arsenic, lead, mercury, silver) at concentrations equal to, or higher than, those given in 40 CFR 261.24
<u>EPA/RCRA listed waste categories</u>		
E	F001-F005	Spent solvents - spent halogenated solvents such as TCE, chlorinated fluorocarbons; spent nonhalogenated solvents such as acetone, methanol, and others; also mixtures/blends containing, before use, 10% or more (by volume) of these solvents (see 40 CFR 261.31)
F	F006-F028	Sludges - wastewater treatment sludges from electroplating operations, spent solutions from certain electroplating operations and other nonspecific sources, wastes from the production of certain chemicals (see 40 CFR 261.31 for additional details)
G	P001-P122 and U001-U249	Discarded commercial chemicals - discarded chemicals, as listed in 40 CFR 261.33, such as cyanides, benzene, chlorophyll, etc.

Table 1. Categorization of hazardous wastes for HAZWDDD (continued)

<u>TSCA regulated hazardous wastes</u>		
J	(none)	PCB wastes - any form of PCB wastes (liquid, solid, etc.)
<u>Other hazardous wastes</u>		
I	(none)	Asbestos - any form of asbestos
K	(none)	Poisons - identified otherwise by DOT numbers
L	(none)	Experimental animal wastes and infectious wastes
M	(none)	Combustibles - materials that have a flash point above 60°C
U	(none)	Hazardous constituent not identified (unknown)
Z	(none)	Hazardous material other than any of the above mentioned

The data bases are only as effective as the completeness and timeliness of their information allow; they are continually undergoing improvement and updating as the corporate plan is developed. A protocol is being established for routine maintenance of the waste stream and treatment, storage, and disposal (TSD) data bases. This maintenance activity will permit rapid update and reprioritization of needs as well as response to regulatory changes and changes in site activities. Quality assurance is vital to the data base activities, and the cross-checking done by the corporate and installation teams helps ensure that all information is correct.

The installations have agreed on a common format to use in developing their HAZWDDD implementation plans, and are committed to completion and publication of the plans by the fall of 1988. An example outline is given in Table 2.

Table 2. Outline of HAZWDDD implementation

I.	Introduction
II.	Waste Stream Identification and Evaluation
III.	Assessment of Current Capabilities
IV.	Evaluation of Treatment, Storage, and Disposal Alternatives
V.	Technology Development and Demonstration Needs
VI.	Facilities Planning and Development
VII.	Schedule and Budget Summary

Each of these plans has been developed in a phased approach, with the initial three chapters and the discussion of waste characterization being completed and reviewed by the installations and the corporate team before the remaining chapters were written. The drafts from each of the installations were reviewed by the corporate team, and suggestions for improvement, based on the work of other Energy Systems teams, were provided. The members of the corporate team acted as facilitators and consultants to the installation teams during this effort. Several problems were encountered in the writing of the installation plans, but they were resolved satisfactorily through suggestions offered in the periodic workshops held during the plan development.

Corporate Plan and Assessment of Needs

The workshops held to assist the installations with their implementation plans were also used to describe and resolve common waste concerns and to characterize near-term corporate technology and facility needs. Table 3 shows the preliminary listing of the waste concerns.

These concerns are addressed in a detailed analysis of each waste stream, which includes approaches to dealing with them, in the corporate plan.

Table 3. Common waste concerns

Waste generated as a result of treating groundwater contamination
Contaminated soils removed from the ground
TSCA ash
Sludges
Surface contamination
Chromium sludges
Contaminated cooling tower materials
Substitution/recovery for chlorinated solvents
Gas cylinders

Issues requiring guidance or resolution were identified during the course of the corporate plan development, and these are summarized in Table 4. These issues were selected because their handling and resolution are fundamental to a sound and complete hazardous/mixed waste strategy. The corporate plan provides a detailed discussion of the topics listed in the table.

Table 4. Summary of strategic issues

Section	Category	Issue
2.1	Waste Minimization	Avoidance Conversion to nonhazardous wastes Minimization of secondary wastes Delisting Below regulatory concern/health-based standards Role of risk assessment
2.2	Consolidation	Common Concerns Shared technology development Shared facilities Program interfaces (LLWDDD, HAZWRAP) transportation
2.3	Internalization	Commercial treatment/disposal DOE liability Federal regional facilities
2.4	Disposal	Last Recourse Regional vs on-site vs commercial

Study of the common concerns presented in Table 3, the issues summarized in Table 4, and a review of the needs given in the installation plans resulted in a list of needed activities, as shown in Table 5. This is the nucleus of an effort to select problems to be studied and proposals for solutions to be developed. Although the estimates for time are preliminary they do allow priorities to be established.

The ultimate objective of HAZWDDD is to ensure that Energy Systems has the capability either internally or commercially for treating and disposing of all of its hazardous and mixed wastes. The data developed by the method described in this paper are used to analyze the requirements of the waste treatment system. Questions related to this analysis are:

1. Is the required treatment and disposal capability available?
2. Does each available treatment/disposal facility have sufficient capacity to handle all of the potential waste streams to be assigned?
3. Is each waste stream being handled in a manner commensurate with regulatory requirements and company policy?

This integrated systems analysis follows the conceptual design framework shown in Fig. 1.

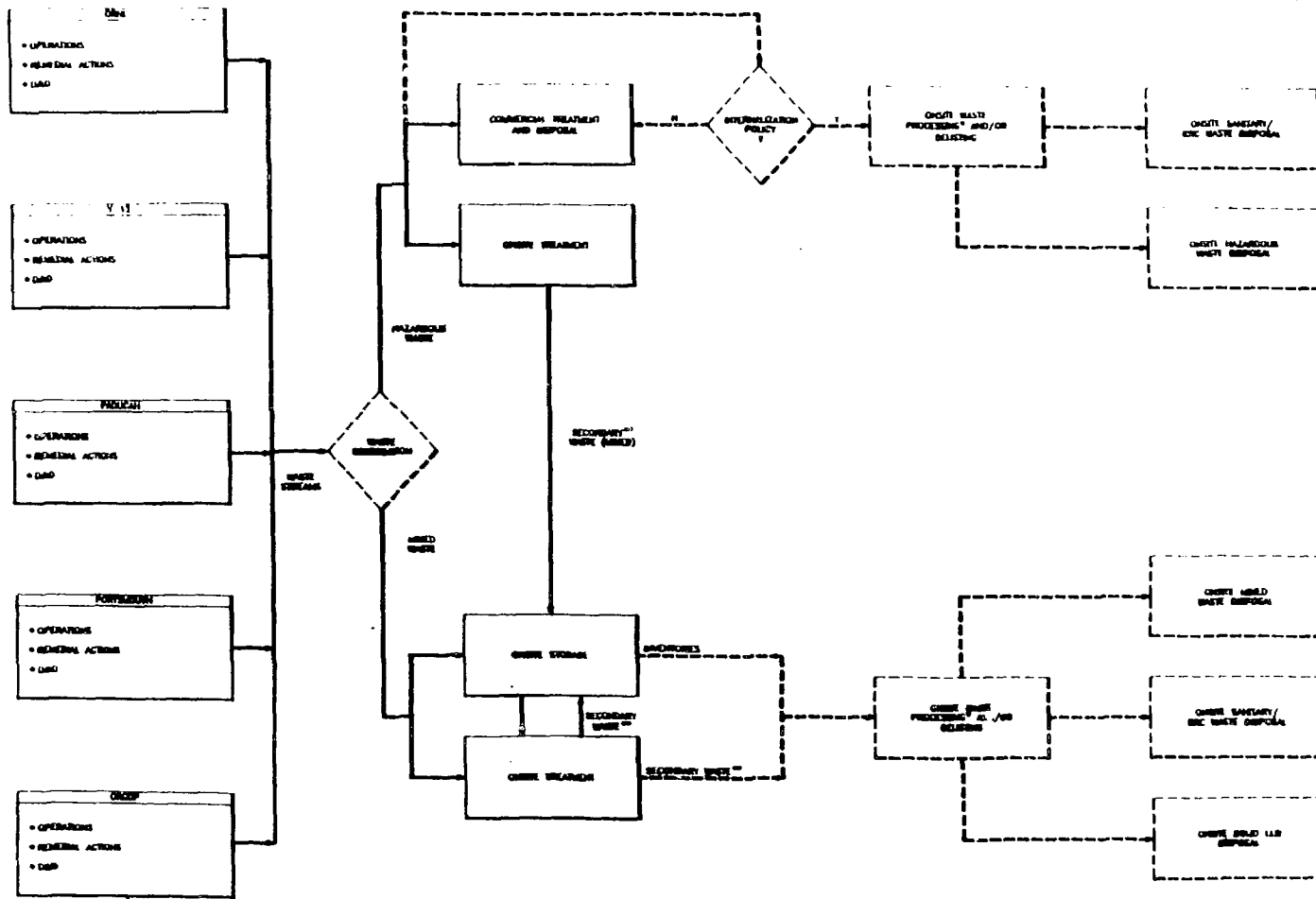
Results

The planning exercise to date has resulted in a draft of a corporate plan for dealing with both current and near-term needs for hazardous and mixed waste problems. The HAZWDDD Plan will be used by Energy System and DOE-ORO management in dealing with these problems over the next decade. Naturally, changes in both the waste stream mix and the regulations continually occur, and the plan will be updated and revised annually to respond to these changing conditions. The overall approach used here will continue to be employed to develop recommendations for the future course of the program.

Table 5. Activities summary

Proposed Study Demonstration	Time Frame	As Spent \$ Expense	TEC Capital
1. Position papers/protocol	1989-1991	\$1,250,000	
1.1 BRC/HBL and risk assessment			
1.2 Statistically valid waste characterization			
1.3 Delineating			
1.4 Mixed waste disposal			
1.5 Commercial treatment/disposal cost benefit analysis			
2. Studies	1989-1991	450,000	
2.1 Evaluate broadening TSCA Acceptance criteria			
2.2 Evaluate in situ oxidation of chromium sludges*			
2.3 Evaluate private cooling tower disposal practices*			
2.4 Evaluate cylinder transfer equipment			
3. Technology demonstrations			
3.1 Conversion of mixed waste to hazardous or LLW	1989-1994	5,000,000	
3.2 Waste minimization	1991-1994	2,000,000	
3.3 Treatment of hazardous wastes	1989-1993	2,100,000	
4. Facilities			
4.1 Storage (GPPs)	1993-1997	500,000	6,000,000
4.2 Treatment 1 (LI)	1991-1997	800,000	10,000,000
4.3 Treatment 2 (LI)	1993-1999	800,000	10,000,000
4.4 Disposal (LI)	1992-1999	2,000,000	30,000,000
5. Environmental documentation	1982-1984	2,500,000	

* Diffusion plants only



ORO REFERS TO A FEDERAL FACILITY

* THE PURPOSE OF WASTE PROCESSING IS TO DEVELOP A WASTE FORM THAT MEETS THE ACCEPTANCE CRITERIA FOR DISPOSAL. THE PERFORMANCE AND WASTE MANAGEMENT ASSOCIATED WITH WASTE PROCESSING AND DISPOSAL OPTIONS WILL DETERMINE THE TECHNICAL FEASIBILITY FOR IMPLEMENTING SPECIFIC WASTE MANAGEMENT PROGRAMS.

** SECONDARY WASTE REFERS TO WASTE PROCESSING BYPRODUCTS. EXAMPLES OF SECONDARY WASTE INCLUDE INCINERATION ASH, INCINERATION SLUDGE, SPLIT STREAM ACTIVATED CARBON, ETC.

REPRODUCED FROM
BEST AVAILABLE COPY

Figure 1. CURRENT PRACTICES (—) AND STRATEGIC OPTIONS (---) FOR HAZARDOUS AND MIXED WASTE MANAGEMENT AT DOE/ORO INSTALLATIONS OPERATED BY MMES*