

TRANSURANIC WASTE ROADMAPS CROSSCUT DOCUMENT

Paul Kryska
Science Applications International Corporation
Albuquerque, New Mexico

Tim Harms
EM-351
U.S. Department of Energy

ABSTRACT

This paper summarizes the crosscutting of the U.S. Department of Energy's Environmental Restoration and Waste Management Transuranic (TRU) waste roadmaps. Topics include the elements of a crosscut, the results and findings derived from the TRU crosscut, and how the crosscut is being used to support the national TRU waste program.

OVERVIEW

Roadmapping is a DOE EM process intended to identify issue-based planning activities necessary for achieving final waste disposal, completing site remediation, and bringing waste operations into compliance. Roadmaps are developed at the installation level by following a systematic planning process that largely focuses on issue identification, root-cause analysis, and issue resolution. The entire process is known as the roadmap methodology, and is the first step towards sound project planning and project management. The resulting roadmap documents identify the actions to be taken and the issues to be resolved to achieve EM's mission. Crosscuts represent the integration of the individual site roadmaps by waste type, leading to the identification of complex-wide issues.

PURPOSE OF CROSSCUTS

This TRU crosscut document represents a qualitative analysis of the TRU waste roadmap products received as of July 31, 1992. The crosscut is an integration of the individual site roadmaps, with the objective of identifying and evaluating issues common to all or most of the installations. The crosscut can be utilized as a tool for understanding the current state of a waste type program on a national level.

ELEMENTS OF THE CROSSCUT

The elements of the crosscut are similar to those of the roadmaps. These elements include the following:

Key Assumptions. This section identifies key assumptions relevant to TRU waste and evaluates these assumptions for impact on treatment, storage, transportation, etc. In addition, the section highlights assumptions that require or expect action from other organizations or agencies. General trends and themes can be derived from the frequency of assumptions pertaining to a particular subject area.

Regulatory Drivers. This section provides a listing of key regulations, acts, and orders pertaining to the management of TRU wastes.

Milestones. This section lists the high-level milestones driven by regulations and DOE commitments.

Generation, Treatment, Storage, and Disposal (T/S/D) Impacts of Issues. This section includes high-level flow diagrams for each installation that traces TRU waste from generation to disposal. Site issues and assumptions that impact progress are denoted at the appropriate step in the flow diagrams.

Issues Analysis. This section categorizes issues into basic subject issue groups from which analyses can be prepared. The groups provide a profile of issue topics which currently impact the TRU waste management program.

Headquarters Issues. This section identifies issues that the installations have stated as requiring Headquarters (HQ) actions to achieve resolution. The issues are organized in the same manner as the *Issues Analysis*.

TRU WASTE ROADMAPS EVALUATED FOR THE CROSSCUT

The following sites prepared roadmaps in time to be included in the crosscut analysis:

1. Albuquerque Field Office
 - a. Mound Plant
 - b. Los Alamos National Laboratory (LANL)
 - c. Sandia National Laboratories, Albuquerque
2. Battelle Columbus Laboratory Decommissioning Project
3. Idaho National Engineering Laboratory (INEL)
4. Nevada Field Office
5. Oak Ridge National Laboratory (ORNL)
6. Rocky Flats Plant
7. Savannah River Site (SRS)
8. West Valley Demonstration Project

KEY ROADMAP ASSUMPTIONS

Assumptions are used in roadmap development to help define a position on an issue that has not been resolved. In the preparation of roadmaps, sites have made numerous assumptions to help facilitate their planning process. This section analyzes those assumptions relating to TRU waste, and the impacts they may create.

Once the key assumptions were identified, they were entered into a data base. The assumptions were then sorted on the key words and interfaces. These various lists of assumptions were analyzed to determine if there were any common themes or conflicts in the planning between sites, or if major issues arose.

As an example, the keyword 'Treatment' and the discussion associated with treatment assumptions is included here.

Treatment. The majority of treatment related assumptions addressed the availability and lack of availability of treatment technologies. Other assumptions were that the

treatment technology would be developed to meet the requirements of the WIPP waste acceptance criteria (WAC). ORNL assumes that it will be the primary TRU treatment facility for the DOE complex, while LANL assumes that it will not process wastes from other sites. Most treatment assumptions lacked sufficient detail to determine treatment needs.

In addition to sorting the assumptions by subject keywords, assumptions identified as making reference to other agencies or organizations, requesting or assuming that they will take some specified action were also discussed. The appropriate agency may either be specifically or implicitly identified in the assumption. The value of grouping assumptions this way is that common concerns or expectations among a majority of the sites can be identified. For assumptions so identified, it is likely that the agency requiring the action may place a higher priority on resolving or performing to that assumption.

As an example, the keyword 'States' and the discussion associated with assumptions related to state interfaces is included here.

States. Most of the assumptions indicate that the respective states will be included in negotiated compliance agreements. The remaining assumptions discuss New Mexico's agreement on waste drum sampling, the possibility that New Mexico will not grant U.S. Environmental Protection Agency (EPA) regulatory authority over TRU waste, and the likelihood that Tennessee will not limit RCRA storage capacity at Oak Ridge.

MILESTONES

The milestones chart represents complex-wide, programmatic events that impact each site. These include milestones developed in Federal Facility Compliance Agreements between the sites and host states, regulatory driven milestone dates and court-ordered milestones.

GENERATION, TREATMENT, STORAGE, AND DISPOSAL IMPACTS OF ISSUES AND ASSUMPTIONS

This section illustrates the waste cycle from generation to disposal on a site-by-site basis. For each site, a process flow diagram was developed. Based on the information in the roadmaps, the flow diagrams are designed to answer the following questions:

- Where will waste be stored?
- Where will waste be treated?
- What treatment options exist?
- When will those treatment options be available?
- Where will waste be disposed?
- What disposal options exist?
- When will those disposal options be available?
- What are the issues and assumptions that relate to each area?

The diagrams show the flow of TRU wastes from generation to treatment to disposal. For each of these areas, specific treatment, storage, and disposal options are depicted using a standard notation. This section highlights impediments specific to the generation, treatment, storage, and disposal process and tends to focus on areas unique to each facility.

ISSUES ANALYSIS

This section of the crosscut presents the issues as they were identified in the various roadmaps, and provides the analysis of these issues as they relate to EM-30, and other HQ organizations.

The process used to develop this section of the methodology was to extract the issues from the roadmaps as they were presented. Once this listing was obtained, the analysis was begun using the "threads of similarity" technique to group similar issues. These groups were further combined into three final categories:

1. Issues related to the availability and adequacy of resources required to accomplish the particular objectives of the site. This category includes personnel resources, and the availability of the financial resources to perform the job.
2. Issues related to the availability of facilities or technical information and criteria necessary to conduct the work.
3. Issues related to the availability and adequacy of policy and procedures to accomplish the program objective.

These three specific areas were chosen because they roughly conform to the three categories associated with MORT root-cause analysis techniques, and aid in focusing the analysis on the root causes of the issues that were identified by the sites.

Figure 1 provides an Issues Breakdown Structure that presents the grouping that resulted from this process.

ISSUES ANALYSIS FINDINGS

The issue blocks in Fig. 1 were ranked based on the frequency of supporting issue statements. All issues in an issue block were summed up to arrive at a score. These scores were then represented in the form of bar charts. The five highest scoring issue blocks are presented in Fig. 2. A discussion of each of these blocks is provided below.

Limited T/S/D Facilities On-Site and Off-Site. Because there have been so many issues identified within this category, they have been broken down into separate treatment/processing, storage/handling, and disposal groupings. In general, there is a sense that TRU waste facilities are inadequate. The lack of options for the management of TRU waste is also cited. The uncertainties associated with WIPP is identified as an issue that is hampering the development of the necessary facilities. The inability of some site facilities to support other TRU operations, such as TRU waste retrieval, was also specified. Some sites also feel that they do not have the necessary facilities to provide for waste certification.

With regard to treatment/processing, most of the issues center upon the need to process both the current TRU inventory and future streams resulting from facility shutdowns. The WIPP WAC is recognized as the governing requirement for the final waste form. It is generally felt that none of the sites currently have, or will have in time to support the WIPP schedule, the necessary treatment facilities that are required to meet the RCRA Land Ban requirements.

In the area of storage/handling, the impact of the uncertainty associated with WIPP is also identified. It is difficult to project storage needs for an indefinite period. Some sites have specific regulatory limits imposed on storage capacity, and many also have physical space constraints.

For disposal, relatively few issues were identified. The issues that were brought out centered on the lack of an alternative disposal site to WIPP, and the absence of a contingency if WIPP does not open.

Waste Characterization (Insufficient Analytical Equipment, Methodologies, Technologies, Laboratories). These issues addressed not only the lack of capability, but also the lack of capacity to perform the necessary characterization analyses. The lack of capability included an inability to characterize headspace gases, VOCs, solidified waste forms, high Pu content materials, and heterogenous waste forms. Radiological protection of workers conducting the analyses was also raised.

Inadequate Site Program. Some sites observed deficiencies in their programs which will affect their ability to support the national strategy. Not all sites have the documentation and certifications in place to ship waste. Waste minimization programs are not fully implemented on all sites. Deficiencies exist in ES&H programs. Many specific deficiencies were identified that relate back to the need for a national strategy. Without the national strategy, the sites can not develop coherent, comprehensive site programs.

Lack of a National TRU Strategy. The need for a national TRU waste strategy appears many times throughout the site roadmaps. Some aspects of this issue are as follows:

1. The impact of and the need to integrate D&D waste generation into the strategy.

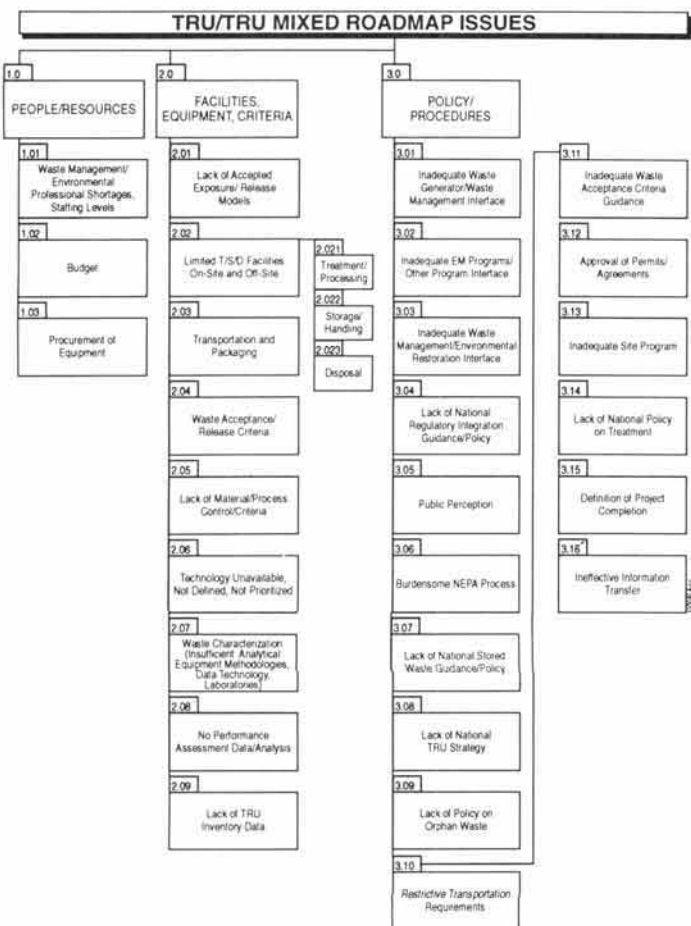


Fig. 1. Transuranic waste roadmap issue breakdown structure.

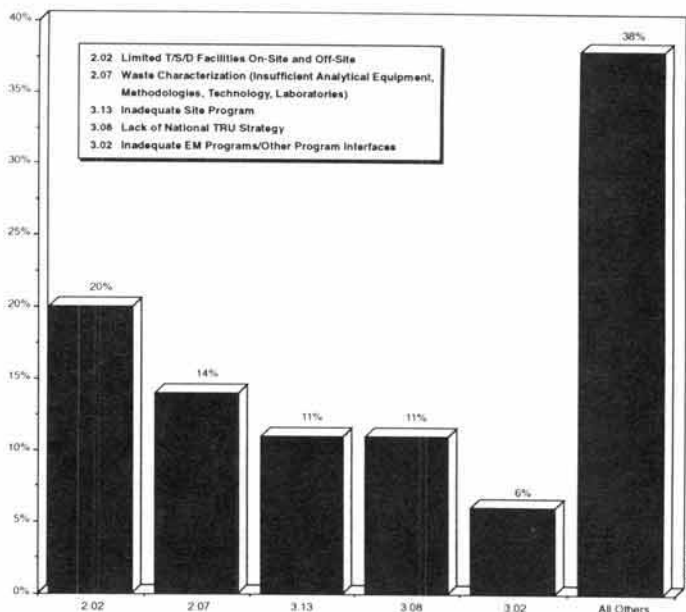


Fig. 2. Five most frequently cited issues.

2. The need to develop work-off plans for wastes that are currently in storage.
3. The need to fully establish the waste certification and documentation requirements.
4. The lack of final WIPP WAC upon which to base site programs.
5. The need for guidance and a strategy on reclassified TRU and other "orphan" wastes.

Inadequate EM Programs/Other Program Interfaces. Issues identified included the potential conflict of mission priorities and objectives, inadequate oversight, the lack of guidance concerning the disposition of residues and Pu scrap, and the sense that ES&H requirements may be overly restrictive in some cases.

ISSUES REQUIRING HEADQUARTERS PARTICIPATION

This section is devoted to issues that require some level of HQ involvement to obtain resolution.

The same Issues Breakdown Structure was used for HQ issues as for all of the issues. From the frequency analyses, it is apparent that the HQ issues are largely associated with Policy and Procedures. The following is a breakdown of the Headquarters issues:

- 59% Policy and Procedures
- 37% Facilities, Equipment, and Criteria
- 4% People/Resources

Close examination of the Policy and Procedures area revealed that 25 percent of those issues relate to the need for HQ to develop a national TRU waste strategy. The sites' request for HQ to develop a national strategy is primarily driven by uncertainties surrounding the WIPP facility, the inability to dispose of TRU waste or TRU-mixed waste at off-site facilities, and the lack of a systems approach in technical and programmatic planning. Another significant observation is that 15 percent of Policy and Procedures issues relate to the need for a national regulatory integration policy. This is due to a variety of regulatory uncertainties, including the

applicability of some D&D-related DOE Orders, integration of audits and reviews to reduce duplication of effort, and common agreement of D&D criteria among the DOE, the NRC, and the EPA.

The Facilities, Equipment, and Criteria area is largely related to the limited T/S/D facilities available. Fifty-three percent of the Facilities, Equipment, and Criteria issues relate to limited T/S/D options. This is primarily due to the following: The storage capacity of TRU waste is rapidly reaching its limit at many sites, treatment of LDR TRU mixed waste at other facilities is not feasible, and the cost and size of TRU waste facilities cannot be finalized until the WIPP capacity and dates are finalized. Twenty-two percent of the Facilities, Equipment, and Criteria issues relate to inefficient analytical capability. This is largely due to the fact that the existing sampling and analytical methods may not be appropriate for the characterization of TRU/TRU mixed waste. Additionally, accepted methods for performing sampling analysis and characterization have not been fully approved by the EPA. Also, there are no sampling and analytical capabilities to meet off-site shipping and WAC requirements at a number of sites. Another issue that is common to this area is that there is limited technology for the treatment of TRU waste throughout the complex.

Each of the issues discussed in this section is being addressed by the HQ issues resolution process. HQ has initiated a formal issues resolution process that focuses on obtaining and tracking resolution plans for HQ-related issues. This

process is in its initial stages. When fully implemented, it will report on actions that lead to the resolution of HQ issues.

CROSSCUTS SUPPORT THE NATIONAL TRU WASTE PROGRAM

The Defense Transuranic Waste Integration (DTWI) Program has defined a set of Deliverable Program Documents detailing the management planning of the project. One of the first elements of this management system is the preparation of a Current State Document, which addresses the TRU program's current configuration and issues currently facing the TRU program, and strategies that have been developed to address those issues. Input to the Current State Document was obtained during a two-day workshop consisting of HQ personnel, as well as site personnel knowledgeable of the TRU waste programs at their respective sites. The crosscut was prepared to support the Current State Workshop by providing a departure point on defining current issues. The crosscut took individual site issues and integrated them into a single set of issues that attendees were then able to use in further defining TRU issues and possible strategies. Additionally, the Roadmap Project Office is working with EM-351 to establish a set of common assumptions that all of the sites can use in their TRU roadmaps.

From the results of the TRU crosscut, the DTWI Program has been able to direct its resources at addressing issues that have been raised by a majority of the sites and are deemed extremely important to achieving the objectives of the DTWI Program.