

SITE NEED STATEMENT

General Reference Information

Need Title: Oversize TRU Boxes Size Reduction
Need Code: NV07-0200-03
Need Summary: A technology and facility are needed that will reduce the size of oversize, nonstandard TRU waste boxes and their contents, currently stored at the Nevada Test Site. The waste and current containers must be reduced to fit into Waste Isolation Pilot Plant (WIPP) approved standard waste drums or boxes. Once packaged into approved standard containers, the waste could then be certified and shipped to WIPP for disposal. Disposition of this waste would eliminate the need for further surveillance, maintenance, and control expenditures and will ensure compliance to the current NTS Federal Facility Compliance Act (FFCA), Site Treatment Plan (STP). The current WIPP shipping schedule includes a window of opportunity for the transport of the NTS Oversized TRU to WIPP (FY 2005) should size reduction, repackaging, and subsequent waste certification take place in time.

Origination Date: August 1, 2001
Need Type: Technology
Operations Office: NNSA/NV
Geographic Site Name: Nevada Test Site
Project: NV350/TRU/Mixed TRU
National Priority: Medium
Operations Office Priority: 3 of 13

Problem Description Information

Operations Office Program Description: The mission of the National Nuclear Security Administration Nevada Operations Office (NNSA/NV), Waste Management (WM) Program is to provide safe, cost-effective, and environmentally sound hazardous and radioactive waste operational, technical and transportation planning services to on-site and off-site generators and others seeking to use NTS resources, while protecting the public and the environment.

Need/Problem Description: A technology and facility are needed that will reduce the size of oversize, nonstandard TRU waste boxes and their contents, currently stored at the NTS. The waste and current containers must be reduced to fit into WIPP approved standard waste drums or boxes. Once packaged into approved standard containers, the waste could then be certified and shipped to the WIPP for disposal. There is a similar need at the Lawrence Livermore National Laboratory (LLNL) for size reduction (see DOE Oakland Operations Office Technology Need OK01-32). Disposition of this waste would eliminate the need for further surveillance, maintenance, and control expenditures. The current WIPP shipping schedule includes a window of opportunity for the transport of the NTS Oversized TRU to WIPP (FY 2005) should size reduction, repackaging, and subsequent waste certification take place in time.

Functional Performance Requirements: This new technology is a functional assemblage of capabilities that are required to properly reduce the size of TRU waste equipment and containers. Any oversize TRU waste size reduction alternative must be capable of accomplishing the following:

- Handle all size packages and waste, ranging in length up to 13'7", width up to 6'4", and height up to 6'9".
- Capable of handling waste packages with up to 55 grams of Pu-239.
- Capable of handling boxes weighing up to 6,100 lbs.
- Capable of cutting stainless steel of at least one-half inch thickness.
- Capable of performing size reduction without adverse effects resulting from the presence of foam.
- Reducing all waste to a size that enables packaging in WIPP approved standard waste boxes or drums.
- Handle a variety of irregular shapes.
- Keep secondary solid or liquid waste generation to a minimum.
- Control and limit personnel exposure to harmful substances.
- Contain sufficient storage for processing volumes.

- Have effective containment systems for all phases of operations.
- Have effective monitoring systems for all phases of operations.
- Have effective emergency response capabilities.

Definition of Solution:

Oversize TRU waste will be size-reduced such that it can be characterized, packaged in WIPP-acceptable containers, and certified for disposal at WIPP.

Targeted Focus Area:

Decontamination and Decommissioning; Transuranic and Mixed Waste

Potential Benefits:

The ability to disposition one NTS legacy waste stream for which the defined path forward cannot proceed is the main benefit. Cost avoidance from not having to store, survey, and maintain the waste for an indefinite period of time is also important.

Potential Cost Savings:

See narrative below.

Potential Cost Savings Narrative:

Because this technology is already counted as part of the NNSA/NV WM Baseline, there are no cost savings to identify in comparison to the baseline. Should the baseline plans for the deployment of this technology not be realized, there would be a cost incurred for the continued surveillance, maintenance, and security control. Deployment of the technology would be a cost avoidance.

The cost avoidance potential is dependant on the implementation time frame and availability of a size reduction facility. The earlier such a facility becomes available, the higher the cost avoidance will be by eliminating the need for annual surveillance and maintenance of the TRU Pad and TRU Pad Cover Building. The current cost for maintenance of the NTS Oversize TRU Boxes is approximately \$20,000 per year.

A potential also exists for substantial fines and penalties associated with non-compliance to the NTS STP under the FFCAct. If a size reduction facility does not become available in sufficient time to maintain the schedule in the WM Baseline (parallels the schedule in the STP), the State of Nevada may impose penalties including fines of up to \$15,000 per week.

Technical Basis:

The existing NTS TRU certification system cannot handle the oversize TRU waste boxes. Furthermore, the oversize boxes are too large to fit in the TRUPACT II Type B shipping containers that are required for shipment to WIPP. This transportation issue also poses a technical problem for transporting the NTS Oversize TRU Boxes to another facility for size reduction (see NNSA/NV Technology Need NV26). An acceptable method for transport of the NTS Oversize TRU Boxes has yet to be determined. Sites such as LLNL, Hanford, and Rocky Flats have similar technical issues. If the oversize TRU waste is not reduced sufficiently to allow for repackaging and subsequent transport to WIPP, it will continue to be stored and will be subject to weekly inspections mandated under RCRA due to the declared hazardous constituent (hazardous waste) content. Should the transportation problem be unresolved, the result would likely be continued storage or construction of size reduction capabilities at each site that has oversized TRU waste.

Should there be a change from the current NNSA/NV WM Baseline plans, and a future decision is made to construct a size reduction technology/facility on the NTS, there are coinciding plans to maintain the capability to certify TRU waste for subsequent disposal at WIPP.

Cultural/Stakeholder Basis:

Local stakeholder opinion is based on environmental and health safety issues. Removal of hazardous waste from the site is viewed as a reduction in the overall mortgage that exists on the NTS. Disposition of this transuranic waste at another site will help address the waste disposal equity issue from a Nevada stakeholder perspective.

Environment, Safety, and Health Basis:

Even though the potential is remote, should there be a release or failure of the existing containment system, the material contains constituents that would be considered potentially detrimental to human health and the environment.

Regulatory Drivers:

RCRA - Mixed TRU waste is regulated by the State of Nevada (under RCRA authority) and requires weekly inspections.

DOE Order 435.1 - Radioactive Waste Management.

FFCAct - Associated STP and Consent Order.

Atomic Energy Act of 1954, as amended—Restricted Data

Milestones:

Not applicable

Material Streams: Legacy TRU Boxes (1056) Technical risk score 1. Not on critical path to closure.
TSD System: TBD; Technology TBD (1840)
Major Contaminants: Pu 239
Contaminated Media: Steel boxes filled with glove boxes, equipment, piping, etc.
Volume/Size of Contaminated Media: 58 oversized boxes; 267 cubic meters
Earliest Date Required: 2001
Latest Date Required: 2003

Baseline Technology Information

Baseline Technology Process: The current NNSA/NV WM Baseline includes the use of this enabling technology/facility to size reduce the NTS Oversize TRU Boxes for subsequent certification and disposition at WIPP. The WM Baseline schedule assumes such a facility will be available in sufficient time to meet the designated shipping corridor for this waste.

Should this technology/facility not become available, the waste will continue to be stored, with a continuation of existing surveillance and maintenance of the storage area and containment systems.

Life-Cycle Cost Using Baseline: Approximately \$13 Million in unescalated dollars (\$15 Million in escalated dollars).

Uncertainty on Baseline Life-Cycle Cost: The WM Baseline planning assumption for the boxes is to ship them to an offsite location for size-reduction, characterization, WIPP-certification, and shipping to WIPP. The life-cycle cost includes costs to prepare the waste for shipment and transport it to an offsite location; costs to certify the waste at the offsite location; and costs to load the TRUPAC II containers for shipping the waste to WIPP. The life-cycle cost estimate is a rough order-of-magnitude estimate.

Completion Date Using Baseline: FY 2005

Points of Contact (POC)

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