

Title:

LOS ALAMOS NATIONAL LABORATORY  
SITE INTEGRATED MANAGEMENT PLAN  
URANIUM 233 STORAGE AND DISPOSITION  
VOLUME I  
PROJECT SCOPE AND DESCRIPTION

Author(s):

Jon B. Nielsen  
Randy Erickson

RECEIVED  
APR 06 1998  
OSTI

To be submitted to:

Prepared for the  
U.S. Department of Energy

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED



Los Alamos  
National Laboratory

19980423 158

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the University of California for the U.S. Department of Energy under contract W-7405-ENG-36. By acceptance of this article, the publisher recognizes that the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. The Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. This is a preprint of a paper intended for publication in a journal or proceedings. Because changes may be made before publication, this preprint is made available with the understanding that it will not be cited or reproduced without the permission of the author.

## **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.

**LAUR-  
RSP-**

**DNFSB 97-1 PROGRAM**

Revision 0

July 14, 1997

---

**Los Alamos National Laboratory  
Site Integrated Management Plan  
Uranium 233 Storage and Disposition**

**Volume I  
Project Scope and Description**

---

Prepared by

Jon B. Nielsen, MST-5  
Randy Erickson, NMSM

Prepared for the  
U.S. Department of Energy

<b>1. EXECUTIVE SUMMARY</b>	<b>2</b>
<b>2. ORGANIZATIONAL RESPONSIBILITIES AND INTERFACES</b>	<b>3</b>
<b>3. THE LOS ALAMOS 97-1 PROGRAM</b>	<b>3</b>
3.1. Program Strategy	3
3.2. Los Alamos Site	3
<b>4. LOS ALAMOS INVENTORY</b>	<b>4</b>
<b>5. TECHNICAL APPROACH</b>	<b>4</b>
5.1. Storage	4
5.2. Repackaging	4
5.3. Stabilization	4
<b>6. NUCLEAR MATERIALS PACKAGING</b>	<b>5</b>
<b>7. WASTE TREATMENT</b>	<b>6</b>
7.1. Solid Waste	6

## **1. Executive Summary**

This Site Integration Management plan provides the Los Alamos Response to the Defense Nuclear Facility Safety Board (DNFSB) Recommendation 97-1. This recommendation addresses the safe storage and management of the Departments uranium 233 (<sup>233</sup>U) inventory.

In the past, Los Alamos has used uranium 233 for a variety of different weapons related projects. The material was used at a variety of sites in varying quantities. Now, there is a limited need for this material and the emphasis has shifted from use to storage and disposition of the material.

The Los Alamos program to address the DNFSB Recommendation 97-1 has two emphases. First, take corrective action to address near term deficiencies required to provide safe interim storage of <sup>233</sup>U. Second, provide a plan to address long term storage and disposition of excess inventory at Los Alamos.

## **2. Organizational Responsibilities and Interfaces**

The Los Alamos Response to the DNFSB 97-1 recommendation is managed by the Albuquerque (AL) Office, Weapons Quality Division. The Los Alamos Nuclear Materials and Stockpile Management (NMSM) Program Office will provide overall program management. Program Managers are:

Paul T. Cunningham, Program Director  
Nuclear Materials and Stockpile Management (NMSM)  
(505) 667-9807

Randy Erickson, Program Manager  
Stabilization & Disposition Program Office  
(505) 667-4950

## **3. The Los Alamos 97-1 Program**

### **3.1. Program Strategy**

The Los Alamos 97-1 program strategy is to use existing facilities and capabilities to address the storage and disposition issues outlined in the 97-1 Recommendation. Los Alamos <sup>233</sup>U will be stabilized and repackaged to meet the criteria for shipment and long term storage at Oak Ridge National Laboratory.

### **3.2. Los Alamos Site**

The Los Alamos National Laboratory has <sup>233</sup>U at several sites. The material is currently stored in the TA-55 vault, the Chemistry and Metallurgy Building (CMR) vault, and a the Hillside vault at TA-18 (Los Alamos Critical Experiment Facility, LACEF).

The stabilization, repackaging and staging for shipment will take place in the CMR building. This facility has operational hot cell available for the stabilization and repackaging effort and also has floor hole storage array for interim storage of the <sup>233</sup>U while awaiting shipment.

A broad range of activities will be required to implement the stabilization and repackaging and shipment activities to meet the Boards recommendation. The infrastructure required to allow the implementation of this activity includes

- Technical support
- Facility Management
- Radiation Protection
- Hazards Management
- Waste management and Storage
- Training and certification
- Analytical chemistry support
- Safeguards and security
- Project management

#### **4. Los Alamos Inventory**

The Los Alamos 97-1 inventory consists of 110 items (TABLE 1). The major physical forms are metal and oxides. There are a small amount of other forms which total less than 10% of the inventory by number of items.

The Los Alamos 97-1 inventory is categorized and prioritized for optimized handling based on its material form and condition of packaging. The prioritization was completed by analysis of the Materials Accountability and Safeguards System data base, knowledge of process and existing information on packaging.

#### **5. Technical Approach**

The Los Alamos approach to implementation to the 97-1 recommendation is to transfer the material to the CMR building for interim storage and handling. Final packaging will be in accordance with agreements with ORNL to provide a package that will require minimal handling once received at their site

##### **5.1. Storage**

The <sup>233</sup>U transferred to the CMR from other Los Alamos sites will be stored in two locations, in the floor hole storage array or in a hot cell. Los Alamos selected the CMR for this operation because the availability of the storage locations for high radiation field materials. This will reduce exposure to individuals who will be involved in the project

##### **5.2. Repackaging**

The repackaging of the material will take place in a hot cell in the CMR facility. This option was chosen to minimize exposures to the employees assigned to this task. The repackaging effort includes consolidation of like forms into fewer containers and also packaging the material in container that meet the criteria for the receiving organization (ORNL)

##### **5.3. Stabilization**

Stabilization of some of the material may be required. The stabilization will take place in a hot cell. Material that may require stabilization are metals, filter cakes, and fluorides. The stabilization method chosen is thermal oxidation.

IDES	DESCRIPTION	ITEM COUNT
C13P	Compound/carbide/plutonium 239	3
C211	Compound/dioxide/high purity	3
C217	Compound/dioxide/impure/no major contaminant	28
C21P	Compound/dioxide/plutonium 239	6
C527	Compound/nitrate/impure/no major contaminant	2
C807	Compound/tetrafluoride/impure/no major contaminant	1
C862	Compound/trioxide/multiple contaminants/see remark	3
C881	Compound/U3O8/high purity	2
C887	Compound/U3O8/impure/no major contaminant	3
C88H	Compound/U3O8/History/archival sample	1
K150	Combustible/ceelulose rag(s)/non-specific	2
M011	Metal/high purity/high purity	4
M01E	Metal/high purity/encapsulated	1
M391	Metal/high purity turnings/high purity	1
M447	Metal/impure/impure/no major contaminant	27
M44P	Metal/impure/plutonium 239	2
M467	Metal/impure turnings/impure/no major contaminants	1
M46P	Metal/impure turnings/plutonium 239	1
M745	Metal/spec alloy/part	1
M74E	Metal/spec alloy/encapsulated	1
M74H	Metal/spec alloy/history/archival sample	7
N310	Non combustible/graphite/non specific	1
N550	Noncombustible/nonactinide/nonspecific	1
N67W	Non combustible/plastics/kim wipes/approved designated waste	1
R410	Process Residue/hydroxide precipatate/non-specific	2
R412	Process Residue/hydroxide precipatate/multi contaminant/remarks	1
R780	Process residue/sweepings/screenings/non-specific	3
R78P	Process residue/sweepings/screenings/plutonium 239	1

TABLE 1. Los Alamos 97-1 inventory.

## 6. Nuclear Materials Packaging

To be agreed upon by Los Alamos and receiving site. Los Alamos will package in accordance with receiving requirements for ORNL. This will minimize the amount of handling required at the receiving site.

## **7. Waste Treatment**

Waste generation will be minimized. However some waste will be generated during the repackaging, stabilization, and final shutdown of the project. Waste forms likely to be accumulated are old containers, decontamination wipes, equipment (from process and large equipment required for project, *e.g.* Alpha box).

### **7.1. Solid Waste**

All solid waste will be handled in accordance with Los Alamos, State, and Federal requirements.

M98004321



Report Number (14) LA-UR--98-4883

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Publ. Date (11) 199707

Sponsor Code (18) DOE/DP, XF

UC Category (19) UC-721, DOE/ER

**DOE**