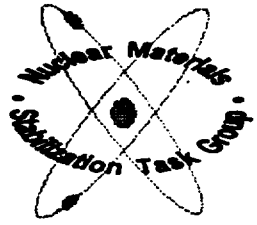

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
RECOMMENDATION 94-1: IMPLEMENTATION

QUARTERLY REPORT

5th Report

Period Covered:
March 1 - May 31, 1996

Submitted: _____ Date: 6/7/96
Henry F. Dalton, Acting Director
Nuclear Materials Stabilization Task Group

Reviewed,
Recommending
Approval: _____ Date: 6/18/96
Jill E. Lytle, Deputy Assistant Secretary
Nuclear Material and Facility Stabilization

Approved: _____ Date: 7/2/96
Alvin L. Alm, Assistant Secretary
Environmental Management

I. PROGRAM OUTLOOK

Implementation Plan

A series of program reviews are being conducted at various sites. Changes to the 94-1 Implementation Plan (IP) as a result of factors changed since the plan was written are expected to be developed out of the these reviews. Individual IP changes will be prepared in consultation with the DNFSB staff and briefed to the Board at the Board's convenience. A complete revision to the 94-1 Implementation Plan is planned for November that will include all of the foregoing changes.

Site Specific Program Changes

Rocky Flats

To date, several key milestones to stabilize high-risk residues at Rocky Flats have slipped. Additionally, several plutonium solution stabilization milestones have been identified as at risk. The program is being reviewed by EM management and will be briefed to the DNFSB in June. Following those reviews, an IP change that addresses both solutions and solid residues will be prepared.

Savannah River

Operation of the Savannah River F- and H-Canyons is currently limited to stabilizing materials already within the canyons (small numbers of Mk31 target slugs, Pu-238 residues, and actinide solutions) due to a recently identified seismic structural concern. Environmental groups have threatened litigation to prevent DOE from introducing any additional material into the canyon facilities until supplemental NEPA documentation is prepared. In parallel with examining the impacts of the canyon seismic issue, the Savannah River program managers at the Operations Office and Headquarters continue to examine the impacts of various scenarios for canyon utilization at the site. The outcome of these considerations has the potential to delay some milestones, while completion of some others may be accelerated. Impacts and revisions to the milestones will be reflected in an IP change to be prepared when the seismic and utilization issues are resolved.

Richland

DOE and contractor management at the Plutonium Finishing Plant (PFP) are implementing breakthrough strategies to integrate stabilization activities with facility deactivation. These strategies include installing stabilization and packaging system equipment in the vault building rather than in PFP, and crating contaminated equipment for storage in PUREX awaiting encapsulation. These and other initiatives may result in changes to the methods and locations of stabilization activities. Once finalized, any changes from the breakthrough strategies will be included in an IP change.

Lawrence Livermore National Laboratory

Original plans called for the procurement of a full stabilization and packaging system for plutonium metal and oxides. However, this was found not to be cost effective because of the relatively small amount of material at the laboratory requiring stabilization. LLNL will

procure a limited amount of stabilization equipment required to complete stabilization in accordance with the plutonium storage standard. It is anticipated that packaging will begin in April 1998 to be completed by May 2002. An IP change will be prepared to reflect these changes.

Mound

The contractor had been proceeding on the assumption that the site's holdings would have to be stabilized and packaged for long term storage per the standard. A program review was conducted at Mound on May 8, 1996, at which the conclusion was reached that the material could be shipped to Los Alamos without significant repackaging. Such repackaging as is necessary to ensure that plutonium is not in contact with plastic will be accomplished by September. The site is working toward shipment of all plutonium holdings to LANL by the end of September.

II. ACTIVITIES

Trade Studies

The following three trade studies have been chartered to determine the preferred method for dealing with certain residue materials located at Rocky Flats, LANL, Hanford, LLNL and other sites. The objective of each study is to evaluate alternatives for treating a category of residues to an end-state suitable for disposition. An end-state is either plutonium metal or oxide suitable for storage per the standard or a form that meets criteria for disposal as waste. All of the studies evaluate worker risk, public risk, worker exposure, waste generation, discharge to the environment, cost, and timeliness as performance measures for comparison of options.

- Disposition of Sand, Slag, and Crucible (completed May 1996)
- Disposition of Ash (planned completion June 1996)
- Disposition of Combustibles (planned completion July 1996).

Plutonium Stabilization and Packaging Procurement Project

On March 11, 1996 the Oakland Operations Office awarded a $54 million contract to BNFL, Inc., to provide the Department with plutonium stabilization and packaging equipment. The prototype is to be installed in Building 707 at Rocky Flats in early 1997. Production units are scheduled at Rocky Flats Building 371, Richland's plutonium storage vault, and the Savannah River Actinide Packaging and Storage Facility. As part of this contract, BNFL will design a storage package that will meet the "Criteria for Safe Storage of Plutonium Metals and Oxides," DOE-STD-3013-94. Once designed and tested, this design will become the Departmental standard package for storage of plutonium.

Research and Development Progress

As the Lead Laboratory for 94-1 plutonium R&D, Los Alamos issued a Technical Program Plan (TPP) outlining the research and development tasks and a work breakdown structure that supports the Research and Development Plan. In FY 1996 there are 180 milestones

included in the funded portion of the TPP. As of May 1996, 72 milestones are complete, one is behind schedule awaiting a piece of equipment to be delivered (salt distillation equipment; schedule should be recovered once equipment is delivered) and all others are on schedule.

Significant R&D accomplishments this quarter include:

- Completed training of site personnel in April 1996 on Precipitation Flow Sheet Processes for Rocky Flats solutions stabilization activities.

- Completed laboratory scale testing of pyrochemical salts distillation process in April 1996.

Significant Activities Planned for Next Quarter:

- Train additional Rocky Flats operators and begin oxalate precipitation of plutonium solutions at Rocky Flats (July 1996).

- Install and demonstrate with radioactive materials, an integrated Electrolytic Decontamination System (August 1996)

- Begin distilling pyrochemical salts (full demonstration) (August 1996).

Briefing to the DNFSB

The 94-1 Research and Development program was presented to the Defense Nuclear Facilities Safety Board on March 27. The scope and progress of the program was presented by the LANL 94-1 R&D Project Leader. The Deputy Assistant Secretary for Technology Development and members of the Plutonium Focus Area Technical Advisory Panel were present and contributed to the discussion.

Technical Advisory Panel (TAP) Activities

The Technical Advisory Panel of the Plutonium Focus Area held its first peer review of LANL 94-1 research April 2-3, 1996. The TAP reviewed in depth 15 areas of 94-1 schedule-driven activities and received an overview briefing on core technology activities. Recommendations generated from the review will be incorporated into the R&D program.

Small Sites and Small Holdings

The Integration Working Group Small Sites/Small Holdings Committee was established to ensure that the many sites that have small holdings of plutonium and other nuclear materials have adequate stabilization plans and that those plans are coordinated with the 94-1 program. Included are DOE, contractor, and university sites that have not been required to prepare Site Integrated Stabilization Management Plans, as well as smaller holdings of materials at 94-1 sites that are not directly addressed in the 94-1 IP.

The Committee initially will identify the most significant issues and holdings, based on results of the Plutonium ES&H Vulnerability Assessment; the Materials In Inventory Report; and program evaluations. Existing corrective action plans will be assessed for adequacy. If warranted, the Committee will foster arrangements among small sites and major 94-1 sites to develop milestones and plans that meet program goals. This task will be completed by September 1996.

Technical Interchange Meeting

The 94-1 Technical Interchange Meeting was held in Germantown, Maryland, March 5-6, 1996. This meeting provided an opportunity for DOE-HQ, field office personnel and site contractor representatives to discuss the progress and issues related to 94-1 nuclear materials stabilization activities. Presentations were given by each of the NMSTG material managers (plutonium metals and oxides, residues, and solutions, spent nuclear fuel, special isotopes, and uranium). Each major site including Savannah River, Hanford, Rocky Flats, Idaho, Oak Ridge, Los Alamos, Lawrence Livermore and the Plutonium Focus Area likewise presented their status and issues. The forum provided an opportunity for each of the various programs and sites to understand the overall scope and direction of the nuclear materials stabilization efforts being coordinated by the NMSTG.

III. MILESTONE SUMMARY

Progress to Date: Milestones Completed

- 153 milestones in Implementation Plan
- 63 completed
  - 24 early
  - 29 on time
  - 10 late
- 4 past due
- 14 at risk

A complete listing of milestones is included as an attachment to this report.

Milestones Completed Late This Quarter

IP-3.6-008 *Issue Foreign Research Reactor EIS ROD* (December 1995)

This milestone was completed on May 13, 1996.

IP-3.1-021 *Complete Solution Technology Development at Hanford PFP* (March 1996)

Development and selection of plutonium solution processing technology at Hanford was completed in April 1996, and resulted in the selection of the vertical calcination technology for PFP solution stabilization.

IP-3.1-009 *Complete Stabilization of F-Canyon Plutonium Solutions* (January 1996)

The stabilization of the 320,000 liters of solution in F-Canyon was completed in April 1996.

IP-3.6-010 *Issue "Management of Spent Nuclear Fuel from the K-Basins" EIS ROD* (December 1995)

The Management of Spent Nuclear Fuel from the K-Basins EIS Record of Decision (ROD) was issued March 4, 1996.

IP-3.3-034 *Develop Risk-based, Complex-wide Categorization and Prioritization Decision Criteria for All Stored Residues* (September 1995)

The risk-based prioritization analysis criteria was completed by Los Alamos National Laboratory in March 1996.

Milestones Missed

IP-3.2-045 *Begin Repackaging Material to Meet Metal and Oxide Storage Standard at Lawrence Livermore National Laboratory* (May 1996)

Packaging will begin in April 1998. The original plans anticipated procurement of a full plutonium stabilization and packaging system, however a full system would be cost prohibitive for the relatively small amount of material at LLNL. LLNL will obtain sufficient stabilization equipment to complete stabilization by May 2002, and package the materials in the standard storage container to meet DOE-STD-3013. An IP change will be prepared to reflect the modified schedule.

IP-3.3-042 *Complete Trade-off Study to Develop Plans for the Stabilization and Packaging of Ash/Residues for Long-term Storage for Lawrence Livermore National Laboratory (April 1996).*

The Task Group has chartered an Ash Trade Study that addresses ash residues at all applicable sites. The requirements associated with Lawrence Livermore ash will be included in this study, which is scheduled for completion in June 1996. The results of this trade study applicable to LLNL will be included in the aforementioned IP change.

IP-3.5-006 *Begin Blending and Shipping HEUN for Stabilization at Rocky Flats* (May 1996)

Beginning the bottling of HEUN and shipping the solutions off site using Safe Secure Transports will not occur until the contractor resolves readiness findings (expected in June).

IP-3.6-037 *Complete Fuel Consolidation to Free Up Approximately 1,250 Additional Storage Spaces in Savannah River's RBOF* (December 1995)

Savannah River began the process of fuel consolidation, however, the milestone to complete fuel consolidation to free up additional storage space in Savannah River's Receiving Basin for Offsite Fuel (RBOF) is expected to be delayed until December 1996. Savannah River has requested this delay due to changes in plans for SNF activities. The majority of offsite SNF receipts, previously expected to be sent to RBOF, will now be directed to the L-Basin. Also, previous SNF proposals included sending seriously degraded fuel to RBOF to benefit from its superior water chemistry. Improvements in conductivity and sludge vacuuming in the L- and K-Basins during 1995 have improved conditions in those basins such that little benefit would be realized by moving their degraded SNF to RBOF. This has reduced the urgency of creating additional space in RBOF and allowed the site to redirect resources to deinventory the P-Reactor Basin and the M-Area. This change will have no impact on Savannah River's capability to support planned spent fuel receipts (foreign research reactor and other DOE spent fuel). The delay in meeting this milestone will have no impact on the risks associated with the RBOF facility, and the accelerated removal of SNF and special nuclear material from the P- and M-Areas will result in greatly reduced risk there.

Milestones at Risk

Rocky Flats

The following milestones are at risk:

IP-3.3-012 *Stabilize by pyrochemical oxidation and repackage 6,000 kgs of higher risk plutonium containing salts* (May 1997)

IP-3.3-013 *Stabilize remaining high risk salts (4,000 kgs) by chemical oxidation* (December 1997)

IP-3.3-014 *Stabilize all sand, slag, and crucible materials and graphite fines* (May 1997)

IP-3.1-020 *Stabilize 80% of high-level solutions and 50% of low-level solutions (18,000 l)* (May 1997)

IP-3.1-005 *All solutions in Building 771 (12,000 liters) stabilized* (December 1997)

IP-3.1-006 *18,000 liters of solutions in Building 371 stabilized* (June 1999)

Savannah River

The following milestones are at risk. Revised completion dates for spent fuel processing, sand, slag and crucible and neptunium solution stabilization will be developed upon resolution of the canyon seismic and utilization issues.

IP-3.6-002 *Complete stabilization of Mk31 targets via dissolution in F-Canyon* (September 1996)

IP-3.6-033 *Begin stabilization of Mk16 and Mk22 HEU SNF* (November 1996)

IP-3.3-022 *Processing of existing inventories of SS&C materials completed* (December 1997)

IP-3.6-003 *Complete dissolution of Mk16 and Mk22 SNF* (November 1999)

IP-3.6-004 *Complete stabilization of resultant uranium solutions from dissolution of Mk16/22 SNF* (Apr 2000)

IP-3.4-019 *Begin stabilization of Np-237 solutions in HB-line Phase II* (July 2001)

IP-3.4-020 *Complete stabilization of Np-237 solutions at HB-line Phase II* (December 2002)