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The Secretary of Energy
Washington, DC 20585

September 19, 2001

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DNF SAFETY BOARD

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

This letter provides additional information in response to your March 23, 2001, letter regarding the Department of Energy's (Department) 2000-1 Implementation Plan (IP) (Revision 1), as was discussed in my June 12, 2001, letter to you.

The following provides details on the Department's additional progress since June 2001 on evaluating the topics specified in your letter.

Savannah River Site (SRS) Plutonium Packaging

On June 20, 2001, the Department terminated the 235-F Packaging and Stabilization Project and decided to implement an alternative approach for establishing a capability at SRS for stabilizing and packaging plutonium in accordance with DOE-STD-3013. The alternative approach involves furnace upgrades and installation in FB-Line of an outer 3013 container packaging system, similar to the system currently being used at Hanford. I anticipate that this new approach, consistent with the Board's preferred approach, will be significantly less costly and will allow SRS to begin packaging and stabilization of plutonium to meet the long-term storage standard sooner. Preliminary design for the new Plutonium Stabilization and Packaging Project has already begun. Appropriate commitments associated with this new project will be provided to you in a revision to our Implementation Plan for Recommendation 2000-1.

With respect to the Americium/Curium Vitrification Project at the SRS, we are reconsidering transfer of the solution to the high level waste (HLW) systems for vitrification in the Defense Waste Processing Facility. By letter dated July 20, 2001, Ms. Jessie Hill Roberson, the Assistant Secretary for Environmental Management, provided a report to you addressing some of the issues related to that approach, and stated that the current project to vitrify the material in the Multi-Purpose Processing Facility (MPPF) has been suspended. Substantial progress has been made in resolving the remaining uncertainties associated with the HLW alternative, and we have been keeping your staff apprised of our progress on this matter. We also provided a briefing for you on this subject on September 5, 2001.



We anticipate a final decision on implementation of the HLW alternative in the very near future. Since a decision to cancel the current project and pursue the HLW alternative will result in irrevocable loss of the material (as waste), we have confirmed with other Department offices that they have no programmatic need for the material. Should we decide to cancel the current project and implement the HLW alternative, we will revise our IP for Recommendation 2000-1 to include appropriate milestone commitments.

Consequences of Plutonium Immobilization Project Suspension

The Department is continuing with preparations and operations to stabilize the plutonium materials identified in the 2000-1 IP and package the material in accordance with the plutonium storage standard as described in commitments contained in that plan. We are confident that properly stabilized and packaged plutonium-bearing materials can be safely stored for up to 50 years. In response to the potential loss of the immobilization disposition pathway for many of the 2000-1 plutonium materials, the Department is currently evaluating alternative options such as discarding some of the more difficult-to-process residue-like materials to the Waste Isolation Pilot Plant, conversion into mixed oxide fuel feed, alternative feeds for vitrification into the Defense Waste Processing Facility, or consolidated storage at an alternative site pending future use or disposition.

Los Alamos National Laboratory (LANL) Delays in Stabilization

The Office of Defense Programs (DP) continues to review the LANL stabilization operations and assess the activities associated with stabilization or discard of legacy materials. Details on the results of initial evaluations are included in Enclosure 1, and will be discussed with your staff during a future briefing at LANL.

DP has directed LANL to re-establish a baseline for the scope, schedule and budget for the entire legacy inventory using project management principles and tools. This re-baselining effort will give DP the data to determine whether an acceleration of the schedule is achievable. We expect this effort to be completed by the end of calendar year 2001. At that time, LANL will provide a fully integrated resource loaded schedule to DP. For DP to be absolutely confident in the stabilization schedule provided by LANL, it is necessary to conduct a thorough evaluation of the rebaselining effort. Once DP has completed its evaluations, the revised integrated schedule will be provided to the Board.

We acknowledge the Board's continuing concern about the rate of progress of the stabilization project and we are committed to increased oversight of the laboratory's efforts to complete this work as effectively and efficiently as possible. In an effort to accelerate the schedule, DP provided LANL with supplemental funds in FY 2001 to support equipment upgrades and to hire additional personnel. In addition, the creation of more formal project management and accountability procedures will enable DP to maintain more effective oversight of this stabilization project.

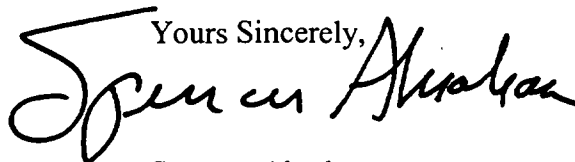
With respect to the remainder of the 2000-1 Implementation Plan, I am approving a change to a commitment affecting Hanford's Plutonium Finishing Plant (PFP). Completion of stabilization and packaging of plutonium solutions at the PFP by December 31, 2001, has been delayed. Operational experience has shown that significantly more precipitate than expected is produced via the magnesium hydroxide process. This results in a greater than planned amount of materials to be thermally stabilized, thus extending the schedule for stabilization and packaging. The January 2001 Implementation Plan for Stabilization and Storage of Nuclear Material noted that the Department is evaluating strategies to reduce the higher than expected precipitate volume from the magnesium hydroxide process and the feasibility of transferring low concentration solutions to the tank farms. If the PFP were to continue stabilization and packaging of the entire inventory via magnesium hydroxide process, completion would be in August 2003. To minimize this schedule slip, three process optimization options will be implemented to partially recover the schedule.

1. Package approximately 1,100 liters of low concentration solutions with an absorbent clay in accordance with the Waste Isolation Pilot Plant acceptance criteria for disposal instead of stabilization via a precipitation process or sending them to the tank farms. The four types of solutions are: Legacy Critical Mass Laboratory Solutions, Plutonium Reclamation Facility Spill Cleanup Solutions, Plutonium Reclamation Facility and Remote Mechanical C Flush Solutions, and Miscellaneous Solutions.
2. Change from magnesium hydroxide precipitation to oxalic acid precipitation. This chemistry change is projected to reduce the precipitation process schedule delay by about half.
3. Add a second shift of operators. This will allow the plant to produce enough feed materials to keep the furnaces running at full capacity.

Commitment #106 in the 2000-1 Implementation Plan, "Complete Stabilization and Packaging Plutonium Solutions," is projected to be completed by July 31, 2002. The basis of the proposed change in technical approach and due date for this commitment at the PFP has been discussed with your staff at Hanford. Additional technical details are provided in Enclosure 2. The Department will incorporate the change formally into the next revision of the Implementation Plan for Recommendation 2000-1.

We continue to closely track progress on all stabilization commitments, and are pleased to be able to continue to show measurable progress at several sites. We will keep you and your staff apprised of our progress in meeting the commitments in this plan. If you have any further questions, please feel free to contact me or Mr. David Huizenga at (202) 586-5151.

Yours Sincerely,



Spencer Abraham

cc:
M. Whitaker, S-3.1

Conclusions from Evaluation of the 2000-1 Stabilization Program
at Los Alamos National Laboratory (LANL)

- Approximately 1,500 additional items have been identified that require repackaging. It was determined that these items, previously labeled as programmatic, may have the same priority for packaging and/or stabilization as the excess items. Including these items among those that are already scheduled for repackaging expands the scope of work included in the schedule for 2000-1 excess inventory provided in Revision 1 of the 2000-1 Implementation Plan (IP). As a result, the total number of items at LANL that remain to be stabilized, repackaged or discarded is about 5,500. LANL's plan is to repackage the entire inventory of vault holdings and store these items in standard containers. This approach is different than the one outlined in Revision 1 of the 2000-1 IP. The current IP is being revised to cover an integrated set of activities for all materials: those excess to Defense Program (DP) needs and those required for programmatic work. Since LANL's inventory is a dynamic, working inventory, the best metric of progress is the fraction of special nuclear material stored in non-standard containers. The goal is to reduce this fraction to zero.
- As a result of loss in key processing personnel to other competing programs and external organizations, LANL will have to hire and train additional personnel. The process of hiring, training and certifying new personnel to work in a plutonium facility requires at least two and a half years. This process also requires the time and effort of currently certified personnel to conduct on-the-job training with the new personnel, further reducing productivity during this period. LANL has begun the process of hiring new personnel, in addition to continuing to process and stabilize residues. Moreover, process lines that have been idle due to reductions in staff must be upgraded, old equipment must be replaced, and new equipment must be installed. As a result, the processing capabilities will not be fully operational until Fiscal Year (FY) 2004. At that time, LANL anticipates processing at an average rate of 800 items/year.
- With respect to the nine unsheltered vessels, LANL is implementing equipment upgrades to empty the vessels at a rate of two per year by FY 2004. The vessels will be dispositioned once the contents have been removed. An analysis of the possible disposition paths for these items was conducted and the results indicate two viable options for disposition. The best option will be presented to the Board staff during a future briefing.
- LANL has implemented an integrated inventory management system and will prioritize the stabilization, repackaging or discard of all excess and programmatic items based on a process hazard analysis and the associated relative consequence of error for each category of material. A process hazard analysis (PrHA) is an organized and systematic method for identifying and analyzing the significance of potential hazards associated with processing or handling of hazardous chemicals or materials. The PrHA methodology used is a modification of the preliminary and process hazards analysis methods described in the American Institute of Chemical Engineers *Guidelines for Hazard Evaluation Procedures* and consistent with DOE STD-3009-94 and DOE-HDBK-1100-96. The unmitigated

Enclosure 1

accident scenario has been defined as a spill in the vault. The unmitigated consequence evaluation has been conducted for each of the matrices to determine the committed effective dose equivalent to the maximally-exposed off-site individual at the site boundary without taking credit for any preventive or mitigating features. The unmitigated consequence ranking gives a clear picture of the first priority matrices. Consideration of the number of items within each matrix further refines the priority of the next set of matrices. Subsequent prioritization within each category will occur based on mass, age, and package type. Initial results of these evaluations and the associated prioritization have been provided to the Board staff for vault materials and vessels. The approach used for this analysis is the one traditionally used for PrHA performed for processes and materials at TA-55 (NMT-AP-588). A peer review of this hazard analysis will be conducted and results will be reviewed with the Board staff.

- LANL is working to establish the capability to produce packages that are in compliance with the Department's standard for packaging and storage of plutonium (DOE-STD-3013-2000). This effort includes the procurement of TIG (Tungsten Inert Gas) welding equipment and refinement of welding parameters. In addition, packaging experts at LANL are working to create a Quality Management Plan for the packaging of materials for shipment to Savannah River Site. Initial estimates indicate that this effort should be completed in FY 2002. However, the detailed schedule is still being refined.
- The balance between the processing of newly generated residues and the processing of existing residues is complex. There are many factors that influence how this balance is established. These include worker safety, worker dose, productivity, and the generation of future legacy materials. Currently, the process capabilities at LANL are split between the processing of newly generated and existing residues. The exact split varies from year to year, however, in most cases, the majority of the capability is expended on existing residues. Further analyses to evaluate the schedule effects of processing newly generated residues instead of existing residues are being considered.

Enclosure 2

Change in Approach for Plutonium Finishing Plant Solution Stabilization

The Plutonium Solutions – Milestone # 106, Complete Stabilization and Packaging Plutonium Solutions, is due December 2001. The stabilization technology specified in the Implementation Plan (IP) for a majority of the plutonium solutions at the Plutonium Finishing Plant (PFP) was magnesium hydroxide precipitation. The IP also stated that consideration would be given to transferring solutions with low plutonium concentration to the tank farms for disposition. To date, approximately 650 of the 4,300 liters of solution have been stabilized.

Operational experience has shown that significantly more precipitate than expected is produced via the magnesium hydroxide process. This results in a greater than planned resources requirement (additional boats that require thermal stabilization, more 3013 inner and outer cans, and additional containers in vault storage), as well as impacts to the schedule. The IP noted that PFP was investigating strategies for reducing the precipitate volume. Recent tests have demonstrated that oxalic acid precipitation significantly reduces the precipitate volume. It can be run on existing equipment, and is expected to reduce the volume by approximately 50 percent.

Another process improvement being aggressively pursued is direct discard of approximately 1,100 liters of low concentration plutonium solutions to the Waste Isolation Pilot Project (WIPP), instead of to tank farms. RL is currently storing 108 containers of nitrate solutions containing low concentrations of plutonium at the PFP. These 108 containers contain a total of approximately three kilograms of plutonium and approximately three kilograms of uranium. These lean solutions contain an average of 29 grams of plutonium per drum (~3.4 grams per liter). While low in plutonium concentration, some of these solutions contain high concentrations of other corrosion-product metals (Fe, Cr, Ni). These solutions are currently scheduled for disposition via the precipitation processing at the PFP and are comprised of four types of solutions: (1) Legacy Critical Mass Laboratory Solutions, (2) Plutonium Reclamation Facility (PRF) Spill Cleanup Solutions, (3) PRF & Remote Mechanical C (RMC) Flush Solutions, and (4) Miscellaneous Solutions.

In order to disposition these solution at WIPP, the plutonium-bearing liquids would be absorbed into a silica-based clay. The outer package for the absorbed solutions would be in 55-gallon containers. Up to a maximum of 20 liters of solution would then be added to the clay sorbent. Fissile material per drum is restricted to less than 80 grams Fissile Gram Equivalent (FGE). The sealed and measured drums would be stored at Hanford's Central Waste Complex (CWC) pending with final shipment to WIPP, consistent with our Transuranic waste shipment schedules.

Enclosure 2

These solutions should be dispositioned as waste to the (WIPP) via the direct discard method for the following reasons:

- Reduces the PFP radiological exposure
- Accelerates solutions stabilization
- Consistent with disposition of other low concentration plutonium-bearing materials such as residues

With these improvements, coupled with the addition of another shift of operation to maximize furnace capacity, the current projected date for the completion of plutonium-bearing solution stabilization is July 31, 2002. This is a seven month schedule slip from the milestone due date, but will result in completion of this work prior to the current estimated date under the existing plan of August 2003.