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The Secretary of Energy

Washington, DC 20585

January 9, 1998

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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:

By letter dated October 9, 1997, Mr. David G. Huizenga, Acting Deputy Assistant Secretary for Nuclear Material and Facility Stabilization, provided you with several copies of a report entitled "Savannah River Site Chemical Separation Facilities Multi-Year Plan." The report described several potential strategies the Department of Energy evaluated for operation of the Savannah River Site (SRS) F- and H-Canyon facilities to support management of nuclear materials, including the phased operating strategy I approved on July 17, 1997. For planning purposes, the phased canyon strategy includes stabilization of certain Rocky Flats plutonium residues, should that be the eventual decision upon completion of a National Environmental Policy Act review.

The impact of the phased canyon strategy and other developments on the Department's February 28, 1995, Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 94-1 for SRS materials was briefed to you at SRS on October 16, 1997. Enclosed is a more detailed discussion of some of those impacts, along with a proposal to delete three of the remaining SRS 94-1 milestones and the associated justification. The Department is working closely with the SRS management and operating contractor, Westinghouse Savannah River Company, to minimize any delays in completing nuclear material stabilization activities.

We look forward to continuing to work with you and your staff as we make progress in our 94-1 program for SRS. If you have any questions, please contact me or have a member of your staff contact Mr. Huizenga at (202) 586-5151.

Sincerely,

Federico Peña

Enclosure

Enclosure 1
Savannah River Site
Proposed 94-1 Implementation Plan Changes

A briefing on the status of the Savannah River Site (SRS) 94-1 Program was provided to the Defense Nuclear Facilities Safety Board on October 16, 1997. During that briefing, the dates for the remaining SRS 94-1 milestones were shown as identified in the February 28, 1995, Implementation Plan and in the recently approved phased canyon strategy, which is described in the "Savannah River Site Chemical Separation Facilities Multi-Year Plan." Dates for five of those milestones are indicated as TBD (to be determined) in the phased canyon strategy. Below is a proposal to delete three of those five milestones.

Proposed Deletion of Three Milestones

It is proposed that the three milestones identified below be removed from the SRS 94-1 program:

- IP-3.6-040 Complete K-Area Basin Sludge Consolidation
- IP-3.6-041 Remove K-Area Basin Sludge
- IP-3.6-042 Remove L-Area Basin Sludge

The Department's Spent Fuel Working Group Report issued in 1993 identified fuel corrosion in both the K- and L-Area basins to be major vulnerabilities. The major actions identified to address the vulnerabilities were:

1. Utilize zeolite in portable ion exchange systems to lower Cesium-137 levels.
2. Develop and implement a corrosion surveillance program.
3. Modify water chemistry of basins through the intensive use of portable deionizers (vendor supplied, shock deionization).
4. Provide deionized makeup water systems for the basins.
5. Maintain basin water chemistry through the application of additional dedicated and upgraded deionizers.
6. Reorientate fuel currently stored vertically to the three deep horizontal array configuration.
7. Complete removal of sludge from basins.

With the exception of the sludge removal, all of these major actions have been completed. As a result, corrosion in the basins is minimal and water chemistry is under tight control. Over the past year, the water conductivity has averaged about 1.2 $\mu\text{mho}/\text{cm}$ in the L-Area Basin and 3.0 $\mu\text{mho}/\text{cm}$ in the K-Area Basin.

Sludge removal was identified as a corrective action because it was originally thought that the sludge was significantly contributing to the conductivity of the water. However, operational history has shown the sludge is not contributing significantly to the population of ions relative to the ability of the deionizer system to remove them. Additionally, the corrosion monitoring program clearly indicates that corrosion has dropped to an almost imperceptible level; no new pits have been discovered in corrosion coupons in over two years.

The urgency to correct corrosion-related vulnerabilities in the wet storage basins has also diminished and continues to do so. Some of the most severely corroded material, the aluminum-clad, uranium metal Mark-31 targets, have been removed from L-Basin and stabilized in F-Area. Removal of the remaining corroded spent nuclear fuel, the Mark-16/22 fuel assemblies, has begun with several shipments of Mark-22 assemblies having already been made to H-Canyon for dissolution. All remaining SRS fuel and targets will be removed from the basins by December 2000.

Based on the above, completion of sludge consolidation and removal as a high priority activity does not appear to be warranted, and the Department proposes to delete from the SRS 94-1 program the three milestones identified above. Sludge removal and disposal will ultimately be completed as part of the site's cleanup activities.

In order to reflect the deletion of the three milestones, bullets five and seven on page 110 of the Department's February 28, 1995 Implementation Plan for 94-1 should be deleted.

Enclosure 2
Savannah River Site
Status of Certain 94-1 Program Activities

The issues and path forward for the other two milestones shown as TBD in the multi-year plan and during the October 16, 1997, briefing are given below. Because of continuing difficulties associated with the program to vitrify the americium/curium solution, a brief update of that program is also provided.

Stabilization of Highly Enriched Uranium (HEU) Solutions

The other two milestones shown as TBD are:

- IP-3.5-002 Complete existing HEU to low enriched uranium (LEU)
- IP-3.6-004 Convert SRS spent nuclear fuel (SNF) to LEU oxide

For the existing HEU solution, the Department's February 28, 1995 94-1 IP cited the preferred alternative from the then Draft "Interim Management of Nuclear Materials" (IMNM) Environment Impact Statement (EIS), which is blending the solution down to less than one percent U-235 and converting the solution to oxide in FA-Line. However, the IP also said the Department is evaluating a stabilization method in which the solution would be diluted to less than 20% U-235 and shipped off-site to commercial fuel fabricators. For HEU solution resulting from dissolution of the SNF (Mark-16/22 fuel assemblies), the IP indicated it would be blended down and converted to an oxide, assuming the preferred alternative from the Draft IMNM EIS were selected for implementation.

The Department has continued pursuing disposition of both the existing SRS HEU solution and Mark-16/22 SNF HEU through selling the material for ultimate use as fuel in commercial nuclear power plants. Additionally, subsequent to the development of the IP and following completion of an EIS, the Department issued in July 1996 a Record of Decision regarding disposition of surplus HEU. The Department decided to blend down and sell the material for commercial use in reactors. The SRS HEU solutions and SNF that are to be stabilized are a subset of the HEU included in this ROD.

Based on the above, our approach for stabilizing the SRS HEU solutions and Mark-16/22 SNF has been to pursue the path of making the material available for use in commercial reactors while maintaining a fall back capability to disposition it more conventionally. Due to the "off-spec" nature of the reactor fuel that would be produced from SRS HEU, and to uranium marketing considerations, DOE is pursuing an agreement with the Tennessee Valley Authority (TVA) for transfer of this material to TVA for use in its reactors. In addition to accomplishing our goal of stabilizing SRS HEU, this would allow DOE to share in the savings that TVA might realize as compared to purchasing virgin fuel.

The next step in determining the scope of SRS involvement in blending down HEU and the resultant impact to SRS 94-1 milestones is for TVA to issue a request for proposals (RFP) in December 1997. The RFP will include SRS 94-1 materials (HEU solutions and Mark-16/22

SNF) as well as a quantity of unirradiated HEU alloy at SRS and HEU metal at Oak Ridge. This RFP will ask fuel manufacturers to bid on several options for fabricating reactor fuel from DOE HEU. In all cases, however, the fuel manufacturers will bid on the assumption that they will receive LEU solution from SRS 94-1 materials (about 5% enrichment) following blending at SRS. The variation in cases will come from how the non-94-1 materials (HEU alloy and metal) are treated and will not affect the SRS 94-1 program.

Fuel manufacturers will be asked to respond to the TVA RFP by March 1998 after which TVA hopes to quickly select a winner. Once a fuel manufacturer has been selected, TVA and DOE will enter into a specific agreement for the transfer.

~~Based on the expected timing of the TVA RFP and the subsequent TVA/DOE agreement,~~ blending down of existing HEU solutions and those to be created from processing of Mark-16/22 SNF, could begin as early as Spring 1998 following the H-canyon Phase II startup. The timing of the actual blending, however, will be influenced by SRS storage considerations and the schedule yet to be determined for acceptance by the selected fuel manufacturer. At the latest, the LEU solutions resulting from blending down SRS 94-1 HEU will be transferred to the fuel manufacturer in 2001 to be made into fuel for the first scheduled use of such fuel in 2002. The actual schedule for blending of HEU to LEU and for subsequent transfer off site will be included in the TVA/DOE agreement expected to be finalized in the spring of 1998.

We believe the path forward described above is preferable for several reasons, including not generating any additional depleted uranium oxide that would require disposition, not having to restart FA-Line, receipt of revenue from the sale, and use of the material in commercial nuclear plants. The Department will keep your staff fully informed as these activities progress.

Americium/Curium Vitrification Project

The failure of test melter 2A as a result of stress-induced cracking at a weld, as well as observations of material deposition in the upper part of the melter, served to highlight the complexity of research and development (R&D) issues which still remain on this project. Therefore, by letter dated November 3, 1997, the Savannah River Operations Office (SR) directed the Management and Operating contractor, Westinghouse Savannah River Company (WSRC), to stop activities associated with the final plant vitrification equipment, until the R&D work has progressed sufficiently to warrant resumption of equipment design. Because of the issues with melter 2A, it was determined that the risk of proceeding with the vitrification design and construction activities outweigh the benefits. WSRC is being allowed to proceed with dismantlement and removal work associated with the F-Canyon Multi-Purpose Processing Facility. Subsequently, problems have also been encountered with melter 2B.

WSRC has been requested to submit a proposed path forward for the vitrification R&D program, including cost and schedule impacts, and to evaluate alternatives for disposition of the americium/curium, including transferring the solution to the High Level Waste tanks. Following its review of the WSRC provided information, the Department will provide either a revised schedule for the vitrification program or recommend a change to the stabilization process for this material. We will keep your staff informed as our review proceeds.